

Theoretical Form Factor, Attenuation and Scattering Tabulation for $Z = 1-92$ from $E = 1-10$ eV to $E = 0.4-1.0$ MeV

C. T. Chantler

School of Physics, University of Melbourne, Parkville, Victoria 3052, Australia^a

Received September 27, 1994; revised manuscript received October 5, 1994

Tables for form factors and anomalous dispersion are widely used in the UV, x-ray and γ -ray communities, and have existed for a considerable period of time. Much of the recent theoretical basis for these was contributed by Cromer, Mann and Liberman while much of the experimental data was synthesised by Henke *et al.* More recent developments in both areas have led to new and revised tables. These works have employed numerous simplifications compared to detailed relativistic S-matrix calculations; the latter do not lend themselves to convenient tabular application for the range of Z and energy of general interest. Conversely, the former tables appear to have large regions of limited validity throughout the range of Z and energies, and in particular have important limitations with regard to extrapolation to energies outside tabulated ranges.

In the present study, the primary interactions of x-rays with isolated atoms from $Z = 1$ (hydrogen) to $Z = 92$ (uranium) are described and computed within a self-consistent Dirac-Hartree-Fock framework. This has general application across the range of energy from 1–10 eV to 400–1000 keV, with limitations (described below) as the low- and high-energy extremes are approached. Tabulations are provided for the f_1 and f_2 components of the form factors, together with the photoelectric attenuation coefficient for the atom, μ , and the value for the K-shell, μ_K , as functions of energy and wavelength. Also provided are estimated correction factors as described in the text, conversion factors, and a simple estimate for the sum of the scattering contributions (from an isolated atom).

The method used herein is primarily theoretical and considers intermediate assumptions which limit the precision and applicability of previous theoretical tabulations. Particular concern involves the application of the dispersion relation to derive $\text{Re}(f)$ from photoelectric absorption cross-sections. The revised formulation presented here explicitly avoids most of the limitations of previous works. Revised formulae can lead to significant qualitative and quantitative improvement, particularly above 30–60 keV energies, near absorption edges, and at 0.03 keV to 3 keV energies. Recent experimental syntheses are often complementary to this approach. Examples are given where the revised theoretical tables are in better agreement with experiment than are those based on experimental syntheses. ©1995 American Institute of Physics and American Chemical Society.

Key words: anomalous dispersion; attenuation; $E = 1-10$ eV to 0.4–1.0 MeV; form factors; photoabsorption tabulation; scattering cross-sections; $Z = 1-92$.

Contents

1. Introduction and Importance of Form Factors . . .	71	8. Choice of Interpolation Formalism.	76
2. Form Factors and Standard Definitions	72	9. Results for Hydrogen and Helium	79
3. Available Tabulations and Basis of Current Formalism	73	10. How to Use These Tables.	79
4. Basic Transform Equations.	73	11. Limitations of the Current Tabulation	80
5. Avoidance of Singularities in $f'(E)$ Above Edges .	74	12. Other Current Concerns	81
6. Avoidance of Imprecision in $f'(E)$ Below and Near Edges	74	13. Summary and Typical Uncertainties	81
7. Integration Precision Requirements	76	14. Acknowledgements	82
		15. References	82
		16. Explanation of Tables and Tabulated Figures . .	83

^aGuest worker: Quantum Metrology Division, National Institute for Standards and Technology, Gaithersburg, MD 20899, U.S.A.

©1995 by the U.S. Secretary of Commerce on behalf of the United States. This copyright is assigned to the American Institute of Physics and the American Chemical Society.

Reprints available from ACS; see Reprints List at back of issue.

1. Introduction and Importance of Form Factors

In the x-ray energy range covered here, the primary interactions of photons with atoms are photoabsorption and coherent (elastic) scattering. Inelastic (Compton) scattering

becomes dominant for all elements as the higher (γ -ray) energies are approached. For light elements, this transfer of dominance occurs at much lower energies (e.g. for hydrogen the inelastic component dominates above 3–5 keV). Additional nuclear scattering and absorption occurs at MeV energies, including pair production and Delbrück scattering from the nuclear field; and nuclear resonant processes (such as nuclear Thompson scattering).¹ For XUV photons at the lower end of the tabulated energy range, lattice phonon absorption, delocalized plasmon excitation, excitons and dipole resonances may appear.² Although these remain qualitatively identifiable as photon interactions with bound electrons, they are not associated with atomic orbitals or isolated atoms.

In the intermediate energy range, typically from 0.01–0.1 keV through to 80–800 keV, the interaction of the incident photon with the electrons — i.e. with the bound atomic orbitals — without production of secondary x-rays of reduced energy, is the dominant process. The photon is then either scattered without altering the internal energy of the atom, or it is absorbed. This absorption is usually into a single atomic orbital, with a consequent ejection of a photoelectron and production of a singly-ionized species.

Both photoabsorption and (Rayleigh) scattering are described by the structure factor F of the material in condensed or gas phase. In particular, diffracted intensity or coherent scattering is a complicated function of F , but for weak reflections is linear or quadratic in F . Equally, transmission through a bulk material is a complex function of F but local attenuation is a relatively simple function of the imaginary component of F .^{3–5} This is well known in the crystallographic community and is used extensively in the multilayer community at lower energies.^{6–8} The structure factor for a given reflection (denoted hkl from the Miller indices) is a sum over the atoms in the appropriate lattice (for a crystal) of the atomic form factors or the x-ray scattering factors f_j of the j^{th} atom:

$$F(hkl) = \sum_j f_j e^{-M_j} e^{2\pi i(hx_j + ky_j + lz_j)} \quad (1)$$

where thermal diffuse scattering is neglected, M_j is the thermal parameter for the given temperature, reflection and atom, and the location of the atom in the unit cell is given by (x_j, y_j, z_j) . For an isolated atom or a single elemental lattice, a scaled atomic form factor may therefore be substituted for the structure factor.

At grazing angles of incidence with solids, photons interact with the surface, and the photoabsorption and reflection processes may be given by Fresnel equations (while still dominated by electron orbital interaction and governed by the structure factor and form factors).⁹ If the atoms in a condensed system may be considered to scatter as dipoles (i.e. for low energies or small scattering angles) then the interaction of x-rays with matter may be described using optical constants such as the complex index of refraction n_r or the complex dielectric constant $\epsilon(E)$, which are related to the form factors by

$$n_r = n + ik = \sqrt{\epsilon} = 1 - \delta - i\beta = 1 - \frac{r_0}{2\pi} \lambda^2 \sum_j n_j f_j \quad (2)$$

where n_j is the atom number density and r_0 is the classical electron radius.

2. Form Factors and Standard Definitions

The real part of the atomic x-ray scattering factor is¹⁰

$$\text{Re}(f) = f_0 + f' + f_{\text{NT}}, \quad f' = f_1 + f_{\text{rel}} - Z \quad (3)$$

where $f'(E, Z) = f' + f_{\text{rel}}$ is composed of the non-relativistic anomalous dispersion f' and the relativistic correction factor f_{rel} . $f_0(q, Z)$ is the 'normal' coherent scattering factor as a function of momentum transfer $q = |\mathbf{K}_r - \mathbf{K}_i| = \frac{4\pi \sin \theta}{\lambda}$, the latter relation for elastic scattering through an angle 2θ .

$$f_0(q) = 4\pi \int_0^\infty \frac{\rho(r) \sin(qr) r^2 dr}{qr} \quad (4)$$

The dependences of f upon q and E may not be strictly separable as implied by the separation into f_0 and f' . Because of this, some authors define a modified form factor MFF (g)¹¹ or anomalous scattering factors (g' and g'').¹² The nuclear Thompson scattering (NT) is small and negative in phase relative to the electronic form factor ($f_0 + f'$), of magnitude $f_{\text{NT}} = -Z^2 m/M$, with small (negligible) energy and momentum dependence.^{13,14} The S-matrix channels of nuclear photoeffect (dipole resonance), pair-N, pair-e production and Delbrück scattering and other, smaller effects are typically neglected, providing upper limits in energy for the validity of these syntheses.

The imaginary part of the dispersion correction is simply linked to the photoeffect cross section $\mu_{\text{PE}}(E)$ (neglecting, or including, bound-bound cross-sections) at the photon energy E :

$$\text{Im}(f) = f''(E) = f_2(E) = \frac{E \mu_{\text{PE}}(E)}{2hc r_e} \quad (5)$$

f_1 and f_2 are used in Refs. 7,15,16. The form factor f_1 is particularly useful in illustrating effects described here because it approximates $\text{Re}(f)$ in the forward scattering direction where $f_0 \approx Z$ and hence estimates the total scattering factor, placing the problems indicated on an absolute footing. It is also appropriate in typical experiments. The standard dispersion relation yields

$$f'(E, Z) = f'(\infty) - \frac{2}{\pi} P \int_0^\infty \frac{\epsilon' f''(\epsilon')}{(\hbar\omega)^2 - (\epsilon')^2} d\epsilon' \quad (6)$$

Here $E = \hbar\omega$ is the x-ray energy, ϵ' is the energy above the electron binding energy of the intermediate (bound or continuum) state, and P represents the principal value. Commonly the equation may be separated by orbital or by electron, with neglect of unoccupied bound states yielding

$$f'(E) = f'(\infty) - \frac{2}{\pi} P \int_0^\infty \frac{(\epsilon^* - \epsilon_1) f''(\epsilon^* - \epsilon_1)}{(\hbar\omega)^2 - (\epsilon^* - \epsilon_1)^2} d\epsilon^* \quad (7)$$

where $-\epsilon_1$ is the electron binding energy, and ϵ^* is the (continuum) energy. The high-energy constant may be combined with relativistic correction factors to provide the separation into f_{rel} and f' as indicated above.

3. Available Tabulations and Basis of Current Formalism

This section discusses other available theoretical, experimental and synthesized tabulations for form factors and attenuation. The main sources for comparison are the theoretical development of Cromer, Mann and Liberman¹⁷⁻²⁰, the experimental-theoretical synthesis by Henke *et al.*⁷ and recent developments along both lines.^{21,15}

These works have employed numerous simplifications compared to detailed relativistic S-matrix calculations,¹² but the latter do not lend themselves to convenient tabular application for the range of Z and energy of general interest. Conversely, the earlier tables appear to have large regions of limited validity throughout the range of Z and energies, and in particular have limitations with regard to extrapolation to energies outside tabulated ranges. This is well known, and other tabulations of attenuation coefficients or form factors based on experiment or on alternate theoretical bases^{22,23} have met with partial success in some regimes, generally with corresponding areas of limitation elsewhere.

With the exception of high-order S-matrix calculations, the method of Refs. 17-20 may be expected to produce greatest theoretical precision and is perhaps predominant in the literature for the last decade. A number of intermediate theoretical and procedural assumptions limit the precision and applicability of this method. The current method, serving as a basis for the present tabulation, allows significant improvement both in the earlier tabulated range and in regions extrapolated with the formulae. A particular concern of the current author lies in suitable extrapolation to high and low energies, and interpolation to energies not covered by the K α values presented in the literature for these tables.

For this purpose a Fortran version of the code was gratefully received from S. Brennan²⁴ which contains the updates of Cromer and Liberman²⁰ in their source code presented in Ref. 18. In this method of Cromer and Liberman, relativistic SCF (self-consistent field) wavefunctions using the Kohn-Sham potential²⁵ and experimental energy levels²⁶ were used to compute partial photoelectric absorption coefficients ($\sigma(E)$) at ten or eleven selected energies, with the Brysk and Zerby program.²⁷ This introduces approximations regarding the potential and edge level derivation, but more significantly uses a model with no molecular or solid-state fine structure. Application of this code^{20,24} to near-edge regions of bound atoms is therefore limited by this procedure.

The development of Cromer and Liberman will be of prime consideration in the current discussion, together with the formulation for avoiding difficulties therein.²⁸ In the code of Ref. 20, separate partial cross-sections were calculated for most orbitals of each element in the range of Z = 3-92. However, some outer orbitals of higher Z elements were omitted or misplaced (with respect to their free-atom ordering or typical bonding patterns), which leads to inadequacies in these cases at lower energies. In the extreme case of Rb (Z = 37), 9 electrons and hence four sub-shells were omitted (4s, 4p_{1,2}, 4p_{3,2}, 5s) leading to unnecessary termination of the tables below 0.112 keV, and significant imprecision below 0.160-0.200 keV, whereas formal results could have been

given down to 0.004 keV. Most elements include all edges down to about 0.050 keV, and light elements (to Ca) generally include all orbitals.

For each orbital, five cross-sections $\sigma(E)$ covered energies of 5-23 keV¹⁸ or 1-80 keV,²⁴ for interpolation and determination of $f''(E)$ (the imaginary, absorptive component of the scattering factor). If the binding energy lay in the range 1 keV < $-\epsilon_1$ < 70 keV, an additional point applied to $E = -1.001\epsilon_1$. An additional five values covered the above-edge range (with energies set for 5-point Gauss-Legendre integration). This second group of 5 points applied to the integral of $f''(E)$ to give $f'(E)$: the locations of E and the form of the integral chosen depends on whether $-\epsilon_1 < 1$ keV, $-\epsilon_1 > 70$ keV, or $-\epsilon_1$ is of intermediate energy.

4. Basic Transform Equations

Appropriate formulae based on Eq. (7) should give a small and smooth integral over the range of the variable of integration, with the dominant term given by analytic form. The situation may be illustrated by considering the above-edge case, given by Eq. (27) of Ref. 17:

$$f^+ = \left(\int_0^\infty \frac{\sigma(\epsilon^+ - \epsilon_1)(\epsilon^+ - \epsilon_1)^2 - \sigma(\hbar\omega)(\hbar\omega)^2}{(\hbar\omega)^2 - (\epsilon^+ - \epsilon_1)^2} d\epsilon^+ + P \int_0^\infty \frac{\sigma(\hbar\omega)(\hbar\omega)^2}{(\hbar\omega)^2 - (\epsilon^+ - \epsilon_1)^2} d\epsilon^+ \right) / 2\pi^2\alpha \quad (8)$$

with α the fine structure constant and energies and σ in atomic units (au). Gauss-Legendre integration points are fixed by the order of the integration, but corresponding energies may be adjusted to optimize the precision for a particular photon energy by scaling (contracting or expanding) the integrating variable, following (but in contrast to) Eq. (29) of Ref. 17 (for Eq. (8)):

$$x = \begin{cases} \frac{|\epsilon_1|}{\epsilon^+ - \epsilon_1}, & \hbar\omega \approx 2|\epsilon_1| \\ \left[\frac{|\epsilon_1|}{\epsilon^+ - \epsilon_1} \right]^2, & \hbar\omega \leq \sqrt{2}|\epsilon_1| \\ \left[\frac{|\epsilon_1|}{\epsilon^+ - \epsilon_1} \right]^{1/2}, & \hbar\omega \gg 2|\epsilon_1| \end{cases} \quad (9)$$

Note that $\epsilon^+ > 0$ and $-\epsilon_1 > 0$ and the integration limits are transformed from (0, ∞) to (1, 0), while in the first case $\sigma(\epsilon^+ - \epsilon_1)$ becomes $\sigma(-\epsilon_1/x)$. By symmetry, this yields a well-defined integral which properly ranges from 0 to 1.

Following the same formalism as in 17-20, improved if not fully optimized relations for f^+ may then be given as

$$f^+ = \frac{1}{2\pi^2\alpha} \int_0^1 \sigma_r dx - \frac{\hbar\omega}{4\pi^2\alpha} \sigma(\hbar\omega) \ln \left(\frac{\hbar\omega - \epsilon_1}{\hbar\omega + \epsilon_1} \right), \quad |\epsilon_1| < \hbar\omega; \quad (10)$$

$$\sigma_i = \begin{cases} \sigma_2, & \hbar\omega \gg 2|\epsilon_1| \\ \sigma_0, & \hbar\omega \approx 2|\epsilon_1| \\ \sigma_4, & \hbar\omega \leq \sqrt{2} |\epsilon_1|; \end{cases} \quad (11)$$

$$\sigma_2 = \begin{cases} -2\sigma(|\epsilon_1|/x^2)\epsilon_1/x^3, & |\epsilon_1|/x^2 = \hbar\omega \\ 2\left(\frac{\sigma(|\epsilon_1|/x^2)\epsilon_1^3/x^4 - \epsilon_1(\hbar\omega)^2 \sigma(\hbar\omega)}{x^3(\hbar\omega)^2 - \epsilon_1^2/x}\right), & \text{otherwise;} \end{cases} \quad (12)$$

$$\sigma_0 = \begin{cases} -\sigma(|\epsilon_1|/x)\epsilon_1/x^2, & |\epsilon_1|/x = \hbar\omega \\ \left(\frac{\sigma(|\epsilon_1|/x)\epsilon_1^3/x^2 - \epsilon_1(\hbar\omega)^2 \sigma(\hbar\omega)}{x^2(\hbar\omega)^2 - \epsilon_1^2}\right), & \text{otherwise;} \end{cases} \quad (13)$$

$$\sigma_4 = \begin{cases} -0.5\sigma(|\epsilon_1|/x^{1/2})\epsilon_1/x, & |\epsilon_1|/x^{1/2} = \hbar\omega \\ 0.5\left(\frac{\sigma(|\epsilon_1|/x^{1/2})\epsilon_1^3/x - \epsilon_1(\hbar\omega)^2 \sigma(\hbar\omega)}{\sqrt{x}(x(\hbar\omega)^2 - \epsilon_1^2)}\right), & \text{otherwise;} \end{cases} \quad (14)$$

for $\hbar\omega > |\epsilon_1|$ (above the edge). At the edge, use $\hbar(\omega + \delta\omega)$ to avoid the computational singularity. Below the edge ($|\epsilon_1| > \hbar\omega$),

$$f^+ = \frac{1}{2\pi^2\alpha} \int_0^1 \sigma_i dx + \frac{\epsilon_1^2 \sigma(|\epsilon_1|)}{4\pi^2\alpha\hbar\omega} \ln\left(\frac{|\epsilon_1| - \hbar\omega}{|\epsilon_1| + \hbar\omega}\right); \quad (15)$$

$$\sigma_i = \begin{cases} \sigma_3, & \hbar\omega \approx 2|\epsilon_1| \\ \sigma_5, & \hbar\omega \ll 2|\epsilon_1|; \end{cases} \quad (16)$$

$$\sigma_3 = -c_1^3 \left(\frac{\sigma(|\epsilon_1|/x)/x^2 - \sigma(|\epsilon_1|)}{(x\hbar\omega)^2 - \epsilon_1^2} \right); \quad (17)$$

$$\sigma_5 = 0.5\epsilon_1^3 \left(\frac{\sigma(|\epsilon_1|/x^{1/2})/x - \sigma(|\epsilon_1|)}{\sqrt{x}(x(\hbar\omega)^2 - \epsilon_1^2)} \right); \quad (18)$$

where, again, $\sigma(|\epsilon_1|)$ is given by $\sigma(|\epsilon_1|(1+\delta))$ to arbitrary precision. The second terms of Eqs. (10) and (15) are always negative, while the first term in Eq. (10) is positive and the first term in Eq. (15) is negative. Use of (these) appropriate functions can lead to problems where integration points would lie beyond the database (11 data points per orbital). In such cases, the above-edge or below-edge behavior should be retained, but the choice of form may be modified appropriately to match the data and to optimize precision. The effects of this formalism and these specific modifications, compared to the earlier results, may be seen generally near edges, at energies below 2 keV or above 70 keV, but also at intermediate energies.

5. Avoidance of Singularities in $f'(E)$ Above Edges

The functional forms of the integral of f'' as indicated in Refs. 17–20 are formally continuous above each edge but include singularities in both numerator and denominator (which cancel). Consequently, the code of Cromer and

Liberman^{17–20} yields divide-by-zero errors for $Z = 18$ (argon, 1.28 keV) and elsewhere at energies for $Z > 2$ corresponding to cancellations (5 per orbital).

The functional forms indicated^{17–20} were otherwise appropriate and valid in the 5 keV–50 keV range. This was the main concern of the authors, but extension beyond this range in either direction requires reevaluation of the construction. In particular, the forms pertain to $E \gg -\epsilon_1$, $E \approx -\epsilon_1$ and $E \ll -\epsilon_1$ and not to $-\epsilon_1 < 1$ keV, $-\epsilon_1 > 70$ keV. Further, that for $-\epsilon_1 > 70$ keV omitted a correction which is increasingly important as E approaches $-\epsilon_1$. The nature and magnitude of this latter problem is depicted in Fig. 1 for uranium. The apparent 'edge' is displaced and offset by several keV with five discontinuities, and at 500 keV (four times the edge energy) the error is of the same magnitude as Z . This energy range is much higher than that of Refs. 15, 17–21. In these figures and in the text, the current formulation avoids or overcomes all problems discussed, as far as is possible within the prescriptions provided. The use of f_1 as the plotting variable follows the standard of Refs. 7, 16 but more importantly places the effects on an approximate absolute footing for the real component of the atomic scattering factor in the forward direction.

6. Avoidance of Imprecision in $f'(E)$ Below and Near Edges

Corrections for below-edge behavior applied to the second (intermediate energy) form in Ref. 18 should also be applied to the other two forms as detailed in section 4. Near to but above edges where $-\epsilon_1 < 1$ keV, the integration is improved by using a form similar to the 'higher-energy' forms rather than that previously indicated, which was optimum only for $E \gg -\epsilon_1$. Well below edges where $-\epsilon_1 > 1$ keV, the integration is improved by using a form similar to the 'high-energy' form rather than that previously indicated, which was optimum for $E \approx -\epsilon_1$. In any of these regions where the functional forms are inappropriate, some improvement in precision can often be gained by using 10-point or higher order Gauss-Legendre integration. This represents improved precision of the integration using a less optimum integral transformation.

Previous below-edge errors are illustrated for the K edge of carbon in Fig. 2. The edge was apparently displaced and asymmetric (typically with a spurious value for the edge itself) as opposed to the revised form ('o' versus '+' in figure). There were also significant errors in the earlier prescription 12% below the edge. This also occurs with similar magnitude (4 e/atom) for the L-edges of uranium at 17–22 keV in Fig. 1. These errors occur at energies well within the range of crystallographic investigation and concern, and are not restricted to regimes of specialized anomalous or other diffraction experiments.

The theoretical-experimental synthesis of Ref. 16 (triangles) is in reasonable agreement with the current revised results well away from the edge, with the exception that aliasing is introduced due to the finite logarithmic grid on which linear interpolation is carried out. This means that the transform is calculated appropriately from the given absorption coefficients to yield f_1 values for specific energies, but

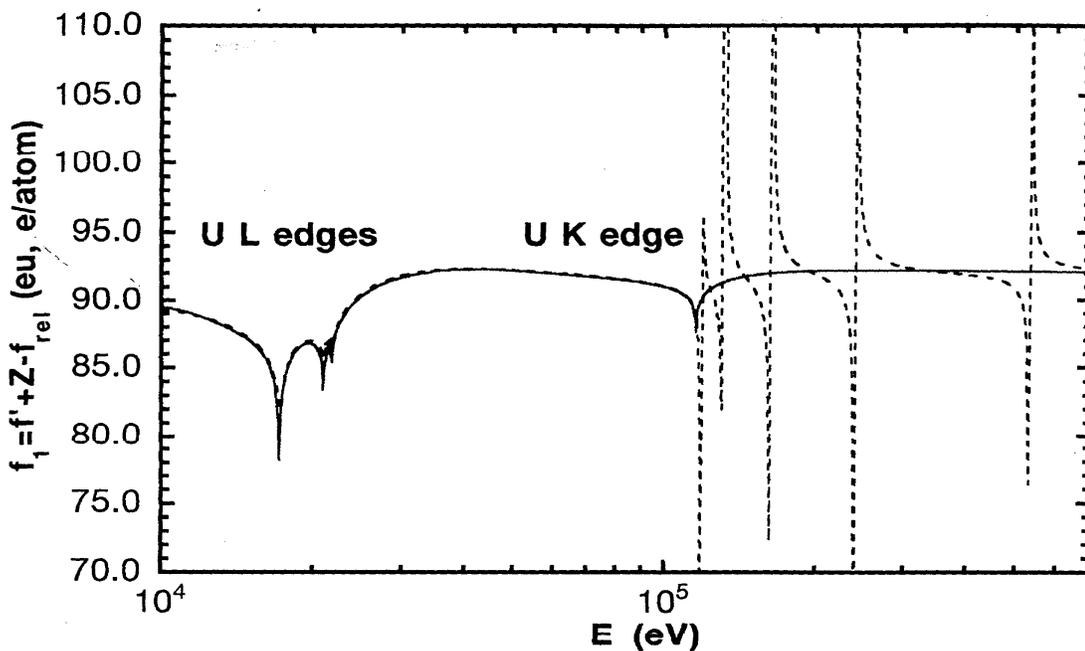


FIG. 1. Form factor f_1 for uranium near K- and L-edges indicating above-edge errors following references 17-20. (Solid line indicates current formulation.)

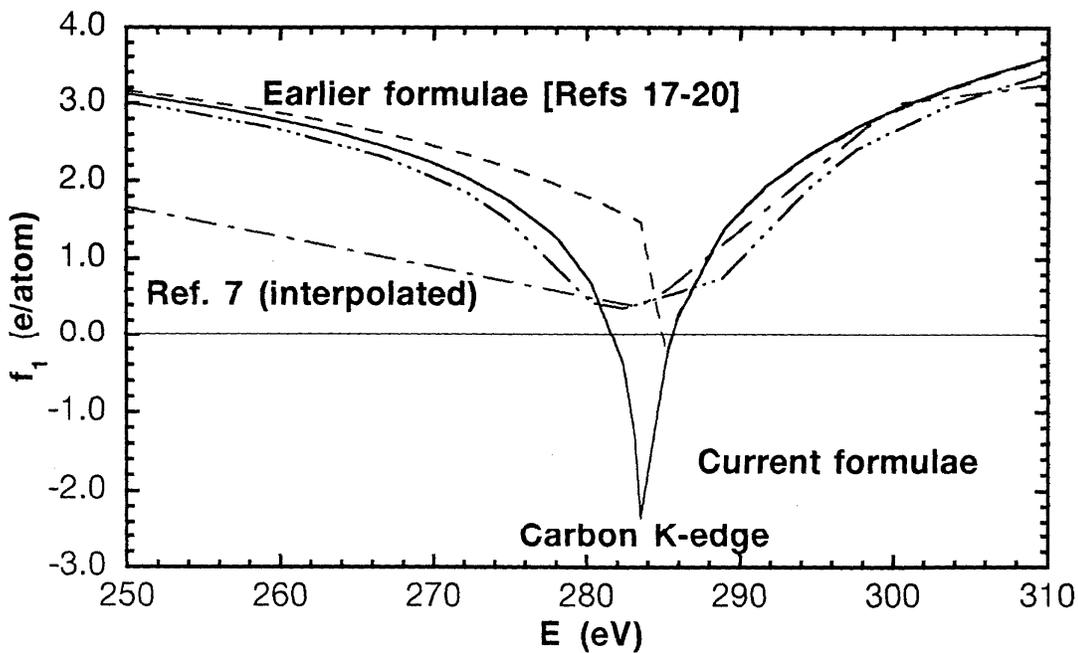


FIG. 2. Form factor f_1 for carbon near K edge indicating asymmetry and discontinuity produced by earlier formulae (dashed line, Refs 17-20), and inadequacy of synthesised data (dot-dash, Ref. 7; ... , Ref. 16), versus the current formulation (solid line).

subsequent interpolation between these points smooths out any finer structure, in addition to generating an interpolation error even in the absence of structure. The earlier synthesis⁷ contains a much coarser grid, so direct comparison of the two primarily indicates interpolation limitations. The relativistic correction factor is only about 0.004 (e/atom or eu in crystallographic notation) and makes negligible contribution to the results (whatever form is postulated for the correction), while $f_0 \approx Z - 0.04$ eu, and does not affect the comparison. Hence a typical experiment in this regime with graphite or other elemental carbon should relate to a real component of the atomic scattering factor given to high precision by f_1 . The current revised formalism yields a width (below zero) of 4.6 eV and a mean f_1 of circa -0.9 eu over this region, with $f_1 = -2.4$ eu at 0.24 eV from the edge, or $f_1 = -4.0$ eu at 0.07 eV from the edge (or about the edge width).

The independent particle approximation common to all theories discussed herein *should* yield the revised smooth, symmetric form, but the formalism may be expected to fail near edges or at low energies, where molecular or collective behavior may occur. However, the revised result is in *good* agreement with Cherenkov radiation studies on the carbon K edge,²⁹ which have derived widths of 5 eV and a mean susceptibility $\chi^1 = 0.0016$ or $f_1 \approx -0.82$ eu, and minima of -2.0 eu $> f_{1,\min} > -5.1$ eu.

Conversely, aliased profiles¹⁶ give minima of 0.3 eu $> f_{1,\min} > -1.3$ eu, non-aliased transforms of a simple edge structure³⁰ yield $f_{1,\min}$ from -5.3 eu to $-\infty$ eu and a width of order 5 eV, while other recent experimental f'' measurements yielded a width of around 14 eV and $f_{1,\min} \approx -1.2$ eu after integration.³¹ All are in disagreement with the Cherenkov studies. In this respect, the importance of *direct* measurements of the scattering factor (anomalous or atomic) cannot be overestimated. Finally, the result of Ref. 21 which might be expected to include contributing collective behavior, appears to give a shift and singularity in the structure.¹⁵

7. Integration Precision Requirements

Several integration procedures were investigated and compared. Five-point Gauss-Legendre integration yields convergence to 5% in many but not all cases where the form is appropriate. In some cases (near edges, particularly with functions not corrected for above or below-edge behavior) a 30-point integration was found inadequate.²⁰ Five-point integration appears adequate for low Z to about 0.01 eu in most regions, while yielding errors of 0.1 eu for silicon near edges, where 10-point and 16-point results appear identical. This error rises to above 1 eu for silver ($Z = 47$) and 5 eu for uranium (Fig. 3), with shifts of 0.3 eu and 1.3 eu, respectively, even midway between edges. The difference between 10-point and 16-point integration is also significant at the 0.15 eu level for $Z = 92$, and is fairly uniform for all energies. The figure indicates major integration and interpolation error in the unrevised formalism^{17-20, 24} of magnitude 1-4 eu across the *medium energy* range of 4-6 keV. This may also be compared to Refs. 15, 16 (including a partial f_{rel} correction of perhaps -1.5 eu), apparently erroneous by up to 5 eu. Although uranium is perhaps an extreme case, this situation is reflected

throughout the medium and higher range of Z . The 16-point integration is therefore used and commended, covering a much larger energy regime with higher precision.

8. Choice of Interpolation Formalism

The 'convergence' with improved integration precision is partially due to inadequacy of interpolation methods rather than convergence to the value predicted by the independent particle approximation. The code of Cromer and Liberman¹⁸ 'interpolates' over $\ln(f'')$ using a quadratic least-squares fit. This smooths precision-dependent noise but also obscures significant local or higher-order structure. The 5 energies used are not well spaced for interpolation to other f'' values, whether for integration or otherwise. Ref. 24 assumes a cubic form for the $\ln f'' - \ln E$ functional relation and uses the Aitken interpolation method; this combination generates non-monotonic and spurious f'' values near to or far above the edge. Reference 22 used a linear interpolation on log-log scales for $E < 1$ keV and noted significant errors for cubic spline interpolation at higher energies (for $Z = 24, 42, 44, 67-69, 75, 76, 85$).

Rational function interpolation is well able to model simple cubic terms (on the log-log scale) but is quite inappropriate for extended or oscillating structure. The latter would commonly produce a pole in the resulting fit near to the real plane and therefore generate large errors. Most investigators have (therefore) relied on polynomial interpolation on the log-log scale.

At energies far above the edge, the form $f''(E) = f_2(E)$ is expected to become approximately cubic, or linear in $\ln f''(\ln E)$. With the photoabsorption data of Refs. 17-20, higher accuracy would follow from correct evaluation of higher order terms but data points are unequally spaced, so divergences easily follow extrapolation or interpolation. This may be limited by extrapolating or interpolating at either end of the energy range with a linear log-log form, while allowing intermediate values to be affected by higher order contributions. Interpolating functions may further be limited to symmetric forms about the region interpolated (i.e. to linear, cubic or quintic log-log interpolation using $n = 2, 4, \text{ or } 6$ data points). Given a sufficiently fine grid, interpolation becomes insensitive to the form used. However, the database discussed herein lacks such a fine grid, drawing attention to the appropriate forms of interpolation. This is illustrated in Fig. 4 for medium energy attenuation by uranium, where the asterisk notes the reduction to a linear log-log form for extrapolation, thus avoiding unnecessary oscillations. Even so, the curves do not converge or maintain a constant ordering, and differ by up to 4 e/atom (eu) or 15% in this range, without the correct form being immediately apparent.

The problem repeats itself for lower energies (less than 9 keV) and also for higher energies (above 30 keV) for most elements, and effects of this problem upon f_1 are often as large. Examples from other elements and regimes allow additional general rules to emerge: Linear log-log interpolation fails near edges (even within the independent particle approximation) where higher order terms are often significant and necessary. Conversely, these are generally absent far above

Uranium, Z=92, effect of integration precision

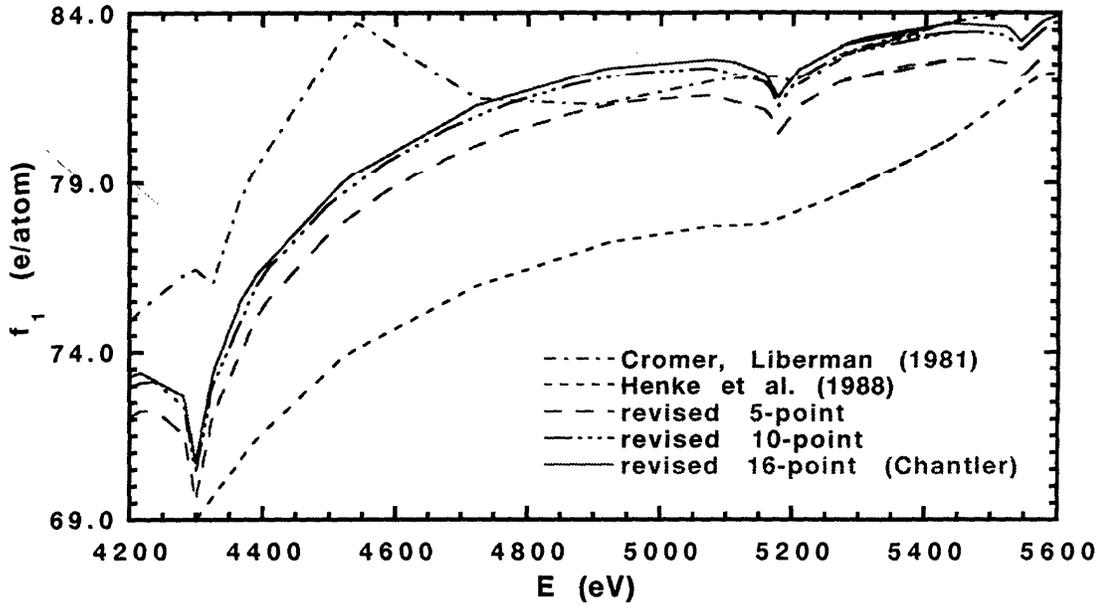


Fig. 3. Form factor f_1 for uranium $M_I - M_{III}$ edges showing importance of higher precision integration and the use of the current method versus earlier methods¹⁷⁻²⁰ and synthesised data.^{15,16}

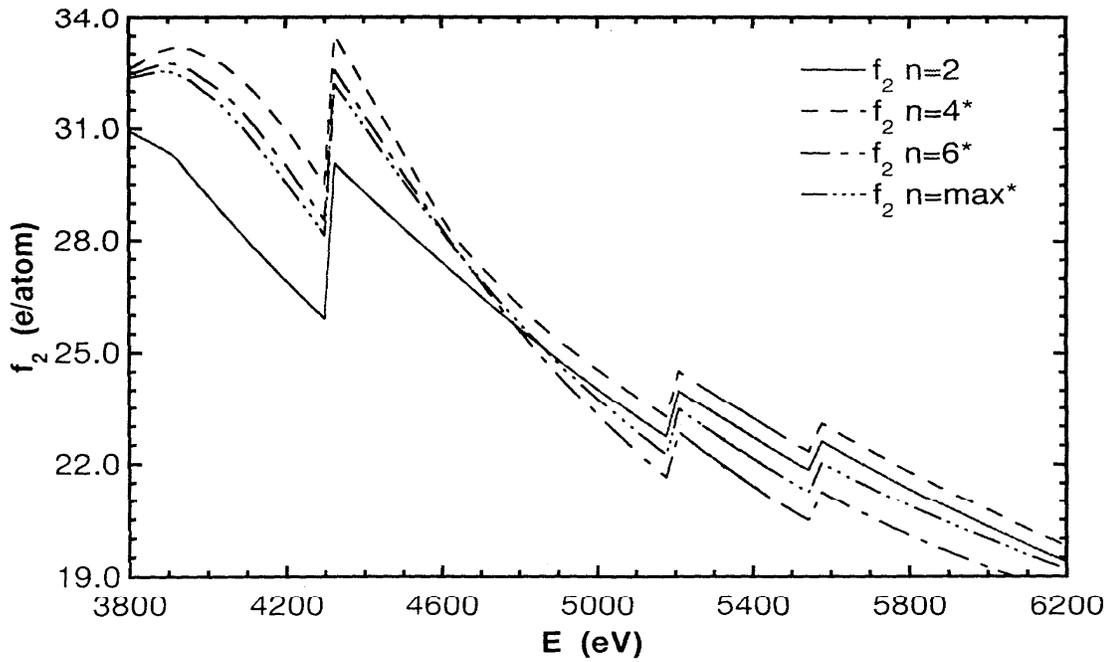


Fig. 4. Form factor $f_2=f''(E)$ for uranium near M_I and M_{II} edges showing large variation between interpolation procedures. n is the number of points in the interpolation, so $n=2$ refers to the linear log-log form.

edges and use of them can introduce spurious oscillations from their contribution in the near-edge region. The relation relatively near edges is often cubic in $\ln f''(\ln E)$ so that a transition from this to the linear form may be accomplished at intermediate energies above each edge. The location of the transition is dependent on the element and edge, and appears (in the current database) to lie between a factor of 1.5 and 4 above the edge.

This prescription is not rigid, but variation between possible alternatives is estimated at (usually) below 1–2%. This allows meaningful comparison of models with experiment, which would otherwise be difficult or dubious. Figure 5 returns to uranium at intermediate energies, again emphasising the potential utility of the current formalism as opposed to earlier forms and synthesised data. Here experiment^{22,33} strongly supports the current formalism and interpolation procedure.

Even at these energies, the contribution of coherent scattering σ_{coh} to the total attenuation coefficient $\mu_{\text{TOT}} = \mu_{\text{PE}} + \sigma_{\text{coh}} + \sigma_{\text{inc}}$ is significant and should not be neglected in these comparisons. (The high-precision experimental data^{22,33} necessarily measures the total attenuation coefficient, and not the photoeffect cross-section (σ or μ_{PE}) in isolation.) The estimate of scattering follows Refs. 34, 35 and may only be accurate at the 10% level, dependent on the experimental arrangement. Neglect of this contribution is still unable to bring Ref. 24 or Ref. 16 into good agreement with experiment in this region.

Elsewhere, however, the local structure allows no simple set of polynomial interpolations (for a given orbital). Typically at low energies and L_1 , M_1 and M_{IV}/M_V edges, the local structure is real but subsequent polynomial extension yields large oscillations well away from the structure. Early truncation to linear forms yields discontinuities in f_2 or its derivative. Scaling any deviations above or below the interpolated points by a constant factor (e.g. 0.5) or a decreasing smooth function can serve to smoothly suppress invalid oscillations. Similar capping or scaling of large deviations from the linear interpolation can also suppress oscillations, but it is difficult to have a uniform and general method which avoids introducing f_1 structure from discontinuities in the derivative.

Any such effects are likely to produce significant features (cusps, peaks or derivative discontinuities) in f_1 . The most significant effects of this sort are found in the K-edge of Na and Mg, L-edges for $Z = 4$ –14, around the L_1 edge for $Z = 30$ –36, M-edges of $Z = 13$ –33, around the M_1 edge for $Z = 61$ –68, and N-edges for $Z = 55$ –65. Problems with cubic spline interpolation were noted earlier.

Extrapolation near the edge is well defined using a linear log-log form matching to the derivative of the following polynomial. Particular regions were interpolated using the polynomial forms, but with a smoothly increasing weighting for the linear solution across the transition region (as opposed to the above alternatives). This smooths the approach to the high-energy linear log-log regime without discontinuity of function or derivative, while remaining uniform and general in application.

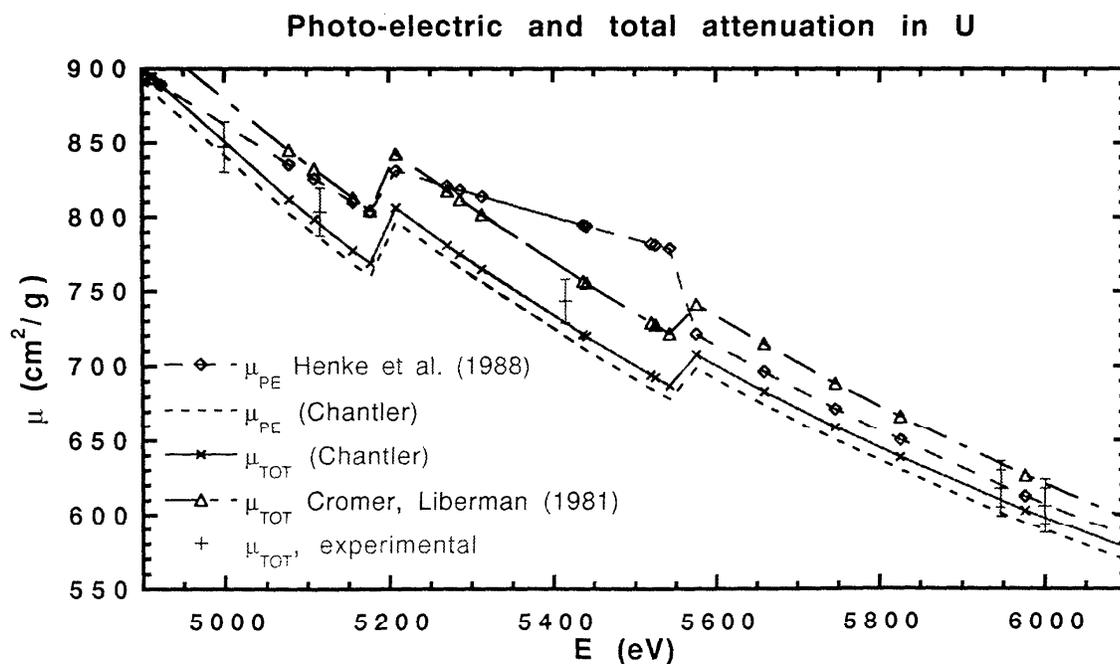


Fig. 5. Photoelectric absorption coefficient for uranium near M_1 and M_{IV} edges showing offset of interpolation procedures and agreement of experiment^{22,33} with current computation versus synthesised data²⁴ and earlier procedures.²²

9. Results for Hydrogen and Helium

Hydrogen and helium serve as another example or extension since the general Cromer-Liberman approach did not apply to these two elements.¹⁷⁻²⁰ The form is however simple, adapted in part from McMaster *et al.*³⁵ The main difference between the (plotted) synthesis of Henke *et al.*^{15,16} and the current form lies in the range and precision of the computation, the location of edge energies, the effective number of electrons assumed, and the interaction with scattering data. In all these respects, the current tabulation appears superior as a statement of atomic form factors.

However, use of atomic form factors in compounds or solids, particularly for hydrogen, involves significant shifts and potential structure not contained in these plots or tables. These chemical shifts and bonding redistributions serve as a caveat on use of the lower energy data (unless gaseous atomic hydrogen is used). Nonetheless, the data is able to represent a good approximation in general cases.

10. How to Use These Tables

These tabulations provide f_1 and f_2 form factors for all elements up to $Z = 92$ from 0.001–0.01 keV to 1000 keV. This exceeds the range for normal x-ray diffraction and crystallography studies but allows limitations and specialized experiments to be investigated with reference to updated and corrected theory. It also allows a sufficiently fine grid with accurate atomic edge structure to allow such experiments as DAFS (diffraction anomalous fine structure) to investigate fine structure and spatial distribution of atoms and electrons within materials.³⁶ Multilayer diffraction experiments may be pursued at lower energies in an analogous manner.

In these cases values for f_1 and f_2 should be extracted from the tables for the given element(s) and energies required. Linear interpolation of f_1 should be adequate, while linear log-log interpolation of f_2 should be adequate on this scale, if required. Equation (3) should then be used to obtain f' using the negative value of f_{rel} as included at the top of each table for each element. For comparison to old data or computations, the value corresponding to reference 6, denoted H82, should be used (following Cromer and Liberman but omitting the Jensen energy-dependent correction).^{17-20,37} More recent work has suggested not only that the Jensen term should be omitted but also that the appropriate relativistic correction is 3/5ths of the Cromer-Liberman value.^{38,39} This latter value is denoted 3/5CI. at the top of each table for each element. Likewise, the nuclear Thompson term (also negative with respect to the atomic phase) is provided at the top of each table for each element.

For comparisons to other results in the forward scattering limit where the momentum transfer $q = 0$, the value of $f_0 = Z$ may be used and the real and imaginary components of f are then fully defined. For large scattering angles it is necessary to use a more appropriate value of f_0 , as may be gained from Refs. 40–41. Then the composition and arrangement of the material may be used as indicated in the introduction to provide structure factors, refractive indices, and Fresnel coefficients, together with scattered, diffracted or transmitted intensities.

For filters or filter materials, the photoelectric attenuation coefficient is provided in order to compare to appropriate experiments or to allow for objects in a beam-line. The conversion to this from f_2 in appropriate units is provided at the top of the table. Use of barns/atom is also common, and the conversion factor for this is also provided. Often this column is not measured, and only the total observed attenuation coefficient $\mu_{\text{TOT}} = \mu_{\text{PE}} + \sigma_{\text{coh}} + \sigma_{\text{inc}}$ is observed. These latter two coefficients are angle-dependent and may in part be determined from appropriate structure factors for a given crystal orientation. However a column is provided for the sum of these two latter coefficients in an average-over-angles for an atomic scatterer.^{34,35} These references should be consulted for details concerning the approximation involved, although the column in the current tabulation is a new computation of the sum. The main assumption is that Bragg-Laue peaks and troughs are avoided, or that the material is randomly oriented and preferably mosaic. If this is not true, it may be necessary to compute the dynamically diffracted intensities from the structure factor rather than rely on the approximation. Further comments are provided in the next section. However, simply summing these two columns allows the comparison of theory to experimental attenuation data.

The column providing the photoabsorption coefficient for the K-shell only is included for two purposes. The first is that at high energies this is the dominant contribution to the total photoabsorption, and provides a guide for the local energy dependence of the cross-section. It serves as an illustration of the isolation of individual orbital cross-sections, particularly for higher energies.

The isolated K-shell cross-section is also important for experimental diagnostics and corrections. In particular, fluorescence yields from atoms are negligible for almost all orbitals except the K-shell, when compared to Auger and Coster-Kronig transitions. However, the fluorescence yield fraction for the K-shell is large, so the dependence of the cross-section upon energy is equally important. The qualitative result in an experimental ion chamber is significant — in these processes, a likely result is that the fluorescent x-ray shall escape from the ion chamber without conversion to (detectable) ion pairs. A more detailed discussion of this is provided elsewhere.⁴²

The plots provide additional data not contained in the tables. This includes a plot of the K-shell contribution to the imaginary component of the form factor f_2 . This is related, as discussed, to the K-shell contribution to the photoabsorption cross-section. The enhanced energy range provides an indication of the appropriate extrapolation to higher energies. It also provides the atomic orbital computation of the lower energy behavior, despite increasing imprecision as the energy falls below 0.010 keV.

The plots also provide comparison to the results of Henke *et al.*^{15,16} This is considered by the author to be the most useful and convenient publication available for comparison. It indicates limitations regarding restricted ranges and tabulation steps, shows good agreement over much of the energy range for many elements, and indicates regions of divergence, difficulty or concern. Some of these concerns have been addressed directly in this paper, while others are left to the

reader. In many cases the best naïve statement of uncertainty in either computation arises from the divergence between the two. This may relate to local structure, absolute values, or global structure. An alternate error estimate is provided in the following section.

For less common use, the edge energies used are provided at the top of each table so that criticism (or experimental investigation) may indicate a shift of the local energy scale which may be appropriate in a specific material or experiment. This is not encouraged or recommended; nonetheless, it is provided as a statement of the assumptions and basis of the computation.

11. Limitations of the Current Tabulation

There are many regimes of Z and E where most recent tabulations are in agreement at the 5% level, particularly well away from edges in the 5–40 keV range, in lower Z elements, and in f'' or μ_{PE} tabulations. Intermediate regimes often impair comparison of tabulations with experiment as uncertainty in f_0 , f'' , f_{rel} , incoherent scattering and integration may all lie at the same level.

There are also regions in some elements where alternate tabulations are clearly superior to Refs. 17–20, 24 and the current formulation. Delays of onset of photoabsorption for 20 eV (3%) above the edge, and peak amplification by factors of two for another 20–40 eV for monatomic gases (e.g.) also occur, not predicted within hydrogen-like calculations and

those assuming plane wave continuum states.⁴³ Tabulations based on the local density approximation (LDA) or on experimental-theoretical syntheses^{15,16,21,30} have potential advantages particularly in low energy regimes such as Fig. 6 where collective valence effects or dipole resonances lead to significant departures from the independent particle approximation. The omission of some outer orbitals, mentioned earlier, accentuates this problem in some medium- Z elements in this same energy range (i.e. up to 0.1 keV or so). In such low energy regimes, seminal and early experimental work and local transforms can still play an important role in revealing additional structure or correcting model-based assumptions.⁴⁴

Often the 'best' tabulation in these cases may be fairly inaccurate, due to intrinsic limitations or additional contributions from exciton resonances or band structure. In the example of Fig. 6, early syntheses⁷ differ substantially from later equivalents^{15,16} and references 17–20, 24 differ markedly from that of the current calculations. Above or below the range of Fig. 6, predictions of the real and imaginary components of atomic form factors from Ref. 16 and herein often agree fairly closely. Discrepancies of an order of magnitude appear in the plotted range. The predictions of Ref. 16 for f_1 and f_2 (that is, the estimated total form factors), though probably the best available elsewhere for most of this region, are limited by the input data, theory and synthesis to be accurate to not much better than a factor of two. This limitation of general tabulations is also true in the near vicinity of edges affected by valence or molecular structure.

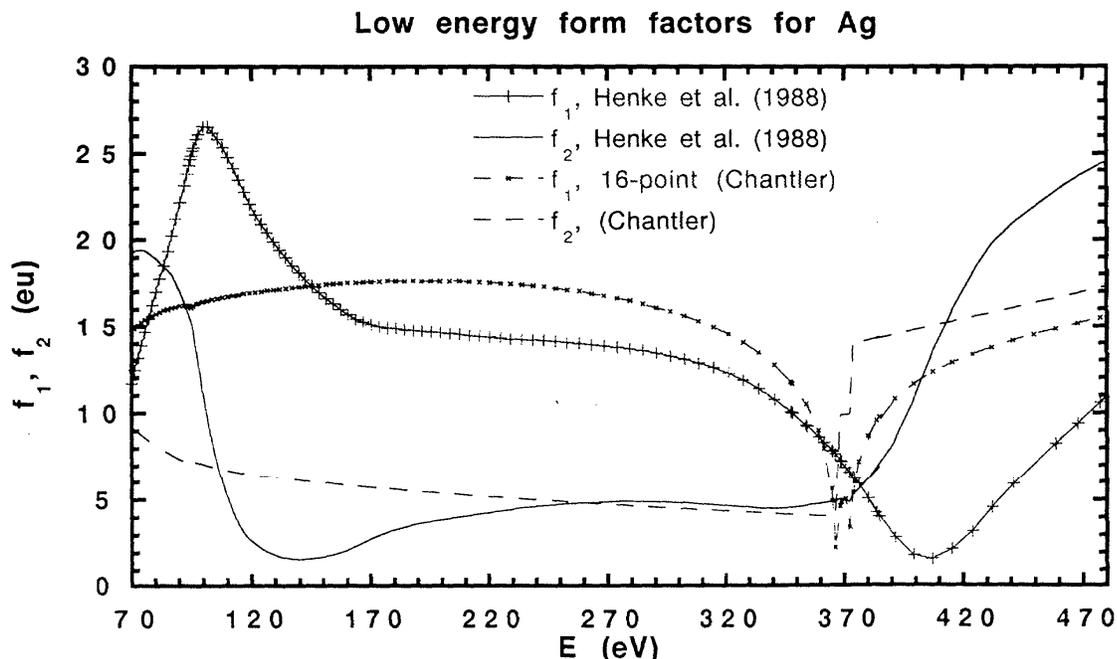


FIG. 6. Example of region for Ag where current method fails to improve over theoretical-experimental synthesis due to collective behaviour. Differences of an order of magnitude in f_1 relate to corresponding differences in $f''=f_2$, from smoothed delayed edges and a dipole resonance. Both predictions differ from earlier synthesis and theory by factors of two, and primarily differ from one another in the vicinity of edges. Edges at higher energies appear largely unaffected by this collective behaviour.

Conversely, syntheses^{7,15,16} tend to diverge from experiment and theory where numerous edges occur or where data do not give detailed variation between and at edges. Divergence can be due to smoothing of edge structure, weighting of experimental data, or Z -interpolation. These are regions of particular usefulness of the current tabulation.

High-energy and high-momentum transfer limitations follow in part from dominance of nuclear resonance and pair-production channels. Each of these attenuation and scattering processes are ideally independent,³⁸ or add together with a well-defined phase (as with the nuclear Thompson term in section 2).¹² General neglect of other contributions does not intrinsically invalidate computations of atomic form factors, but it seriously limits their usefulness and applicability, and the precision to which measurements of these quantities may be made at these high-energy, high-momentum transfer regimes. Hubbell *et al.*⁴⁰ include corrections for radiative and double-Compton contributions to incoherent cross-sections, reaching 1% at 100 MeV energies. Nuclear-field pair production κ_n arises at $2m_e c^2 = 1.022$ MeV and becomes dominant around 10 MeV. Electron-field pair production ('triplet production') begins at 2.044 MeV and contributes above this energy at the 1% level for high Z elements but up to 10% for fluorine and 50% for H (or $1/(1+Z)$). Nuclear photoabsorption consists of one (or a few) peaks (giant resonances) between 10–24 MeV of width 3–9 MeV, contributing up to 10% of the total cross-section in this region. Elastic processes include high energy Delbrück and dipole resonance scattering in addition to Rayleigh and nuclear Thompson contributions mentioned above.

Below these high-energy limits but above 10–300 keV (dependent on Z), incoherent scattering forms the dominant attenuation process, and may be given to 1–2% by integration of the Klein-Nishina formula. Interference between this channel and photoabsorption can affect total cross-sections and form factors at the 5% level.

In the region 10–40 keV elastic scattering may exceed photoabsorption cross-sections (especially at Bragg peaks). This is of prime importance for estimates of total attenuation cross-sections μ_{TOT} or for attempts to compare f'' to experimental cross-sections, and is complicated by the coherence of scattering between adjacent atoms, leading to TDS (thermal diffuse scattering) and Rayleigh single-atom estimates in addition to accurate derivations from the form factor f_1 and diffraction formulae. Of course, a prime purpose of the current discussion has been to generate accurate form factors which can then be used to determine total attenuation (i.e. photoabsorption plus diffraction) for a given orientation of a sample to high precision. They can then be compared to experimental values.

Simple available and tabulated estimates of orientation-averaged scattering can err by orders of magnitude in special arrangements, though they are usually more accurate than this. The simple forms commonly used for such scattering assume that each atom is isolated, so integration neglects crystal orientations leading to Bragg-Laue peaks or hollows. This Rayleigh scattering may be replaced by a TDS cross-section if the crystal orientation is arranged to avoid Bragg-Laue peaks.⁴⁵

12. Other Current Concerns

Most of this description has been concerned with problems of f' or f_1 and f'' or f_2 . Difficulties inherent in the form factor formalism as opposed to the Modified Form Factor formalism or general S-matrix formalisms are discussed elsewhere.^{46,47} Use of Modified Form Factors is of value at or above MeV energies for various angles, where the separability of f_0 and f_1 becomes questionable.¹⁰ Sum rules have been discussed and investigated, particularly at relatively low energies,^{48,49} and may be more generally applied to theoretical or experimental data. Comparisons of form factor predictions to others or to experiment without allowance for the issues raised in this paper will endanger the validity of conclusions drawn.

One of the major differences between these classes of theory, and in particular between RDP, RMP^{38, 39} and S-matrix methods¹² relate not to f_1 or f_2 per se, but relate to the relativistic correction factor f_{rel} . This contribution indicates the correction for the high-frequency limit. For uranium at low energies f_{rel} is of order -2.5 e/atom,¹⁷⁻²⁰ -1.5 e/atom,^{38,39} or -1.2 e/atom.^{12, 39} The differences between these theories are large, with a range at the 1 e/atom level and an uncertainty quoted as ± 0.36 e/atom.³⁹ Equally, for calcium ($Z = 20$), quoted values vary from -0.06 eu to -0.036 eu to -0.034 eu with, again, a quoted uncertainty of ± 0.009 eu.³⁹ These are important and significant differences (particularly for medium and heavy elements), although it should be clear that any comparison of theories or experiments is difficult without correcting for the effects discussed herein with their associated many-electron errors. Issues regarding the forms for f_{rel} demand that input values for f_1 be calculated to better precision than the uncertainty in the relativistic component. Errors of the preceding sections or of integration or interpolation precision at this level are unnecessary and obscure comparison of different models with experiment.

The integration method adopted and discussed herein makes direct use of the separation of orbitals and the assumption that the orbital absorption coefficient is exactly zero below the edge. Correlation between orbitals, excited bound states, level widths and resonance phenomena may require alternate transforms based on $\hbar\omega = (0, \infty)$ to $(0, 1)$ intervals. This general issue was addressed by Cromer and Liberman¹⁷ and has been addressed more recently by Wang and Pratt.⁵⁰ The presence of multiple edges and near-singularities creates difficulty for most standard integration methods. For comparison of theory to experiment, direct measurement of $\text{Re}(f)$ is required, but the current revised theoretical calculation has an advantage over methods based on limited ranges of experimental or synthesized attenuation coefficients, in avoiding smoothing and other problems near edges.

A secondary difficulty, so far as published results are concerned, relates to tabulations often being restricted to a small set of $K\alpha$ lines, or to other discrete sets of energies which fail to reveal major variation of structure with energy.

13. Summary and Typical Uncertainties

The modifications described herein lead to significant qualitative and quantitative improvement, particularly above

30–60 keV energies, near absorption edges, or at 0.03 keV to 5 keV energies. With limitations, the current scheme is able to extend to energies below 0.01 keV. More confidently, it also covers the region above 30 keV towards MeV energies, unlike most tabulations. The current tabulation is complementary to recent experimental syntheses. Examples are given where this formalism is in qualitative agreement with experiment, as opposed to results of the syntheses or of earlier theoretical tabulations. The theory of detailed corrections is summarized briefly.

There are regions of collective, valence, or band structure indicated in Ref. 16 which are not accounted for in the revised formalism presented here, while there are regions near edges and at higher energies accurate to within a few percent in the current calculations which are not adequately represented by Ref. 16 (or other methods). Where the preferred model is not obvious, the model variation may be used as an uncertainty. In many cases, the preferred model may be established by comparison to experimental data or by understanding the nature of processes occurring in the given energy regime. Typically errors of the current revision reduce to 1% at high energies away from edges, if photoabsorption is dominant. Uncertainty may reach 10–20% within 30% of edges, where scattering becomes significant, or in the 0.03–1 keV range (dependent on Z); and can be larger for energies less than 0.03 keV, regions of (collective) valence resonances, and in the near edge region for particular edges with bonding effects. There are tendencies for all schemes to fail below 0.1 keV (approaching a factor of two or more error).

The tabulation presented here resolves many of the difficulties encountered with previous tabulations, while some aspects remain to be treated in greater depth in the future, perhaps including aspects of collective behavior and near-edge effects. Improvement in application would follow use of better f_{rel} and f_0 values, possibly allowing extension to higher energies and momentum transfers.

14. Acknowledgments

The author is indebted to Sean Brennan, Rupert Perera and John Hubbell for provision of the latest versions of the databases involved and for helpful discussions, without which this could not have been pursued. He is also happy to acknowledge discussions with A. Caticha and support from the Lindemann fellowship and the English Speaking Union of the Commonwealth, and particularly NIST and the Quantum Metrology Division.

15. References

- ¹Hubbell, J. H., Gimm, H. A., Øverbø, I., *J. Phys. Chem. Ref. Data* **9** (1980) 1023–1147.
- ²Ascroft, N. W., Mermin, N. D., "Solid State Physics," p629 et seq. (Saunders College, Philadelphia 1976).
- ³International Tables for X-ray Crystallography, Volume III (Birmingham: Kynoch Press, 1983) 2.5–2.6.
- ⁴Chantler, C. T., *J. Appl. Cryst.* **25** (1992) 674–693.
- ⁵Chantler, C. T., *J. Appl. Cryst.* **25** (1992) 694–713.
- ⁶Henke, B. L., Lee, P., Tanaka, T. J., Shimabukuro, R. L., Fujikawa, B. K., *At. Dat. Nucl. Dat. Tab.* **27** (1982) 1–144.
- ⁷Caticha, A., *SPIE Proc.* **1740** (1992) 81–94.
- ⁸Pedulla, J., Deslattes, R. D., Tarrío, C., Watts, R. N., Bartos, A., *SPIE Proc.* **2279** (1994) in press.
- ⁹Parratt, L. G., *Phys. Rev.* **95** (1954) 359–369.
- ¹⁰e.g. Chantler, C. T., in "Resonant Anomalous X-ray Scattering, Theory and Applications," G. Materlik, C. J. Sparks, K. Fischer (eds) (Elsevier, North-Holland, 1994) pp61–78.
- ¹¹Schaupp, D., Schumacher, M., Smend, F., Rulhusen, P., Hubbell, J.H., *J. Phys. Chem. Ref. Data* **12** (1983) 467–512.
- ¹²Kane, P. P., Kissel, L., Pratt, R. H., Roy, S. C., *Phys. Rep.* **140** (1986) 75–159.
- ¹³Berant, Z., Moreh, R., Kahane, S., *Phys. Letts* **69B** (1977) 281–283.
- ¹⁴Ericson, T. E. O., Hüfner, J., *Nucl. Phys.* **B57** (1973) 604–616.
- ¹⁵Henke, B. L., Davis, J. C., Gullikson, E. C., Perera, R. C. C., Lawrence Berkeley Laboratory report LBL-26259 UC-411 (1988), 376 pages.
- ¹⁶Perera, R. C. C., Gullikson, E., private communication (1991); and Henke, B. L., Gullikson, E. C., Davis, J. C., *At. Dat. Nucl. Dat. Tables* **54** (1993) 180.
- ¹⁷Cromer, D. T., Liberman, D., *J. Chem. Phys.* **53** (1970) 1891–1898.
- ¹⁸Cromer, D. T., Liberman, D., Los Alamos internal report LA-4403 UC-34 (1970) 163 pages.
- ¹⁹Cromer, D. T., Mann, J. B., *Acta Cryst.* **A24** (1968) 321–324.
- ²⁰Cromer, D. T., Liberman, D. A., *Acta Cryst.* **A37** (1981) 267–268.
- ²¹Doolen, G., and Liberman, D. A., *Physica Scripta* **36** (1987) 77–79.
- ²²Saloman, E. B., Hubbell, J. H., Scofield, J. H., *At. Dat. Nucl. Dat. Tables* **38** (1988) 1–197.
- ²³Scofield, J. H., LLNL lab. report UCRL-51326 (1973) 374 pages.
- ²⁴Brennan, S., private communication (1991); and Brennan, S., Cowan, P. L., *Rev. Sci. Inst.* **63** (1992) 850–853.
- ²⁵Kohn, W., Sham, L. J., *Phys. Rev.* **140** (1965) A1133–1138.
- ^{26a}Bearden, J. A., *Rev. Mod. Phys.* **39** (1967) 78–124.
- ^{26b}Bearden, J. A., Burr, A. F., *Rev. Mod. Phys.* **39** (1967) 125–142.
- ²⁷Brysk, H., Zerby, C. D., *Phys. Rev.* **171** (1968) 292–298.
- ²⁸Chantler, C. T., *Rad. Phys. Chem.* **41** (1993) 759–766.
- ²⁹Moran, M.J., Chang, B., Schneider, M.B., Maruyama, X.K., *Nucl. Inst. Meth.* **B48** (1990) 287–290, and references therein.
- ³⁰Thomas, M. M., Davis, J. C., Jacobsen, C. J., Perera, R. C. C., *Nucl. Inst. Meth.* **A291** (1990) 107–109.
- ³¹Kerr Del Grande, N., Tirsell, K.G., Schneider, M.G., Garrett, R.F., Kneedler, E.M., Manson, S.T., *J. Phys. Colloque C9, Suppl. 12, Tome 48* (1987).
- ³²Kerr Del Grande, N., *Proceedings, SPIE* **691** (1986) 2–10.
- ³³Kerr Del Grande, N., Oliver, A.J., UCRL Preprint 85683 (1981).
- ³⁴Veigele, W.J., *At. Dat. Tables* **5** (1973) 51–111.
- ³⁵McMaster, W. H., Kerr Del Grande, N., Mallett, J. H., Hubbell, J. H., Lawrence Livermore National Laboratory Report UCRL-50174 (1969) S 2.
- ³⁶Bouldin, C. E., private communication (1994).
- ³⁷Jensen, M. S., *Phys. Lett.* **A74** (1979) 41.
- ³⁸Creagh, D., *NIM* **A295** (1990) 417–434.
- ³⁹Creagh, D., Hubbell, J. H., S 4.2.4, and Creagh, D., McAuley, W. J., S 4.2.6, in *International Tables for X-ray Crystallography*, Vol. C, ed. A. J. C. Wilson (Kluwer Academic, Dordrecht, 1992).
- ⁴⁰Hubbell, J.H., Veigele, W.J., Briggs, E.A., Brown, R.T., Cromer, D.T., Howerton, R.J., *J. Phys. Chem. Ref. Data* **4** (1975) 471–538.
- ⁴¹Maslen, E. N., Fox, A. G., O'Keefe, M. A., S 6.1.1, in *International Tables for X-ray Crystallography*, Vol. C, ed. A. J. C. Wilson (Kluwer Academic, Dordrecht, 1992).
- ⁴²Chantler, C. T., Staudenmann, J.-L., *Rev. Sci. Inst.* (1995), in press.
- ⁴³Deslattes, R. D., *Phys. Rev. Letts* **20** (1968) 483–484.
- ⁴⁴LaVilla, R. E., Mendlowitz, H., *Phys. Rev. Lett.* **9** (1962) 149–150; LaVilla, R. E., Mendlowitz, H., *Appl. Optics* **6** (1967) 61–68.
- ⁴⁵Creagh, D.C., Hubbell, J.H., *Acta Cryst.* **A43** (1987) 102–110.
- ⁴⁶Roy, S. C., Pratt, R. H., Kissel, L., *Rad. Phys. Chem.* **41** (1993) 725–738.
- ⁴⁷Pratt, R. H., Kissel, L., Bergstrom, Jr. P. M., in "Resonant Anomalous X-ray Scattering, Theory and Applications," G. Materlik, C. J. Sparks, K. Fischer (eds) (Elsevier, North-Holland, 1994) pp9–33.
- ⁴⁸Barkyoumb, J. H., Smith, D. Y., *Phys. Rev.* **A41** (1990) 4863–4866.
- ⁴⁹Barkyoumb, J. H., Morrison, T. I., Smith, D. Y., *Phys. Letts* **A143** (1990) 462–466.
- ⁵⁰Wang, M. S., Pratt, R. H., *Phys. Rev.* **A28** (1983) 3115–3116.
- ⁵¹Cohen, E. R., Taylor, B. N., *Rev. Mod. Phys.* **59** (1987) 1121–1148.

16. Explanation of Tables and Tabulated Figures

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV.

Z	Atomic number	f_{NT}	Nuclear Thompson correction to $Re(f)$ following Eq. (4) and Refs. 13, 14
E	Photon energy in kiloelectron volts (keV).	f_2 , K-shell	Component of f_2 relating to the isolated K-shell orbital
λ	Equivalent wavelength using E . $\lambda = 1.23984244 \text{ keV-nm}$, from Ref. 51	$\mu = \mu_{PE}$	Photoabsorption cross-section in cm^2/g
Atomic weight	g/mol, used in determination of conversion factors.	μ_K	Component of μ relating to the isolated K-shell orbital
ρ	Nominal density in typical elemental material, for users g/cm^3	$\sigma(\text{coh}+\text{inc})$	Estimate of coherent and incoherent scattering cross-section sum
μ_a	Conversion for photoabsorption to barns/atom	$= \sigma_{\text{coh}} + \sigma_{\text{inc}}$	
Edge energies	Values taken from Ref. 26	Full lines on plots	Current tabulation (extended) for f_1 , f_2 and μ
Edge labels	Spectroscopic notation ($K=1s$, $L_I=2s$, $L_{II}=2p_{1/2}$, et seq.)	Dot-dash curves	Results reinterpolated from Refs. 15-16, for f_1 , f_2 and μ
f_1, f_2	Atomic scattering factors in electrons/atom (or eu) for forward scattering using Eqs. (3-18)	Dash in f_2 plots	f_2 K-shell
f_{rel}	Relativistic correction to $Re(f)$, following Ref. 6 (denoted H82), and Refs. 17-20 scaled as in Refs. 38, 39 (denoted 3/5CL)	Dash in μ plots	$\sigma(\text{coh}+\text{inc})$

H Z = 1

Atomic weight = 1.008000E+00 g/mol, nominal density ρ (g/cm^3) = 8.9870E-05

$\mu_a(\text{barns}/\text{atom}) = \mu(\text{cm}^2/\text{g}) \times 1.67382\text{E}+00$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e}/\text{atom}) \times 4.17463\text{E}+07$

1 edge. K Edge energy (keV) = 1.36000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.0519E-04, 0.0000E+00 e/atom

Nuclear Thomson correction $f_{NT} = -5.4423\text{E}-04$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm^2/g	$\sigma(\text{coh}+\text{inc})$ cm^2/g	μ_K cm^2/g	λ nm
1.069000E-02	4.54682E-01	0.0000E+00	0.0000E+00	2.2129E-01	0.000E+00	1.160E+02
1.142761E-02	3.97170E-01	0.0000E+00	0.0000E+00	2.4489E-01	0.000E+00	1.085E+02
1.221612E-02	2.99485E-01	0.0000E+00	0.0000E+00	2.7018E-01	0.000E+00	1.015E+02
1.305903E-02	6.85829E-02	0.0000E+00	0.0000E+00	2.9718E-01	0.000E+00	9.494E+01
1.332800E-02	-1.17232E-01	0.0000E+00	0.0000E+00	3.0577E-01	0.000E+00	9.303E+01
1.353200E-02	-5.16414E-01	0.0000E+00	0.0000E+00	3.1227E-01	0.000E+00	9.162E+01
1.358640E-02	-9.98811E-01	0.0000E+00	0.0000E+00	3.1401E-01	0.000E+00	9.126E+01
1.366800E-02	-4.92163E-01	9.5197E-01	2.9076E+06	3.1660E-01	2.908E+06	9.071E+01
1.387200E-02	-4.62805E-02	9.3030E-01	2.7996E+06	3.2309E-01	2.800E+06	8.938E+01
1.396010E-02	4.68513E-02	9.2117E-01	2.7547E+06	3.2589E-01	2.755E+06	8.881E+01
1.492335E-02	4.91043E-01	8.2970E-01	2.3210E+06	3.5630E-01	2.321E+06	8.308E+01
1.595306E-02	6.84358E-01	7.4640E-01	1.9532E+06	3.8839E-01	1.953E+06	7.772E+01
1.705382E-02	8.03468E-01	6.7066E-01	1.6417E+06	4.2212E-01	1.642E+06	7.270E+01
1.823053E-02	8.84640E-01	6.0188E-01	1.3783E+06	4.5742E-01	1.378E+06	6.801E+01
1.948844E-02	9.42415E-01	5.3953E-01	1.1557E+06	4.9424E-01	1.156E+06	6.362E+01
2.083314E-02	9.84335E-01	4.8306E-01	9.6798E+05	5.3246E-01	9.680E+05	5.951E+01
2.227063E-02	1.01491E+00	4.3201E-01	8.0981E+05	5.7199E-01	8.098E+05	5.567E+01
2.380730E-02	1.03710E+00	3.8592E-01	6.7671E+05	6.1269E-01	6.767E+05	5.208E+01
2.545001E-02	1.05295E+00	3.4435E-01	5.6484E+05	6.5442E-01	5.648E+05	4.872E+01
2.720606E-02	1.06395E+00	3.0692E-01	4.7095E+05	6.9702E-01	4.709E+05	4.557E+01
2.908327E-02	1.07121E+00	2.7325E-01	3.9222E+05	7.4030E-01	3.922E+05	4.263E+01
3.109002E-02	1.07558E+00	2.4301E-01	3.2631E+05	7.8408E-01	3.263E+05	3.988E+01
3.323523E-02	1.07772E+00	2.1589E-01	2.7117E+05	8.2815E-01	2.712E+05	3.731E+01
3.552846E-02	1.07815E+00	1.9159E-01	2.2512E+05	8.7229E-01	2.251E+05	3.490E+01
3.797993E-02	1.07727E+00	1.6984E-01	1.8669E+05	9.1627E-01	1.867E+05	3.264E+01
4.060054E-02	1.07541E+00	1.5041E-01	1.5465E+05	9.5986E-01	1.547E+05	3.054E+01
4.340198E-02	1.07283E+00	1.3306E-01	1.2799E+05	1.0028E+00	1.280E+05	2.857E+01
4.639671E-02	1.06974E+00	1.1760E-01	1.0581E+05	1.0449E+00	1.058E+05	2.672E+01
4.959809E-02	1.06630E+00	1.0383E-01	8.7389E+04	1.0858E+00	8.739E+04	2.500E+01
5.302035E-02	1.06265E+00	9.1576E-02	7.2104E+04	1.1254E+00	7.210E+04	2.338E+01
5.667876E-02	1.05889E+00	8.0693E-02	5.9434E+04	1.1634E+00	5.943E+04	2.187E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.058959E-02	1.05510E+00	7.1034E-02	4.8943E+04	1.1995E+00	4.894E+04	2.046E+01
6.477028E-02	1.05134E+00	6.2473E-02	4.0265E+04	1.2336E+00	4.027E+04	1.914E+01
6.923942E-02	1.04767E+00	5.4891E-02	3.3095E+04	1.2654E+00	3.310E+04	1.791E+01
7.401695E-02	1.04411E+00	4.8185E-02	2.7177E+04	1.2947E+00	2.718E+04	1.675E+01
7.912411E-02	1.04070E+00	4.2260E-02	2.2296E+04	1.3214E+00	2.230E+04	1.567E+01
8.458368E-02	1.03745E+00	3.7030E-02	1.8276E+04	1.3452E+00	1.828E+04	1.466E+01
9.041995E-02	1.03437E+00	3.2418E-02	1.4967E+04	1.3661E+00	1.497E+04	1.371E+01
9.665893E-02	1.03147E+00	2.8356E-02	1.2247E+04	1.3839E+00	1.225E+04	1.283E+01
1.033284E-01	1.02876E+00	2.4781E-02	1.0012E+04	1.3985E+00	1.001E+04	1.200E+01
1.104581E-01	1.02622E+00	2.1639E-02	8.1783E+03	1.4098E+00	8.178E+03	1.122E+01
1.180797E-01	1.02387E+00	1.8879E-02	6.6747E+03	1.4179E+00	6.675E+03	1.050E+01
1.262272E-01	1.02169E+00	1.6458E-02	5.4431E+03	1.4226E+00	5.443E+03	9.822E+00
1.349368E-01	1.01968E+00	1.4336E-02	4.4351E+03	1.4240E+00	4.435E+03	9.188E+00
1.442475E-01	1.01782E+00	1.2477E-02	3.6109E+03	1.4220E+00	3.611E+03	8.595E+00
1.542005E-01	1.01612E+00	1.0851E-02	2.9376E+03	1.4168E+00	2.938E+03	8.040E+00
1.648404E-01	1.01456E+00	9.4291E-03	2.3880E+03	1.4084E+00	2.388E+03	7.521E+00
1.762144E-01	1.01313E+00	8.1876E-03	1.9397E+03	1.3969E+00	1.940E+03	7.036E+00
1.883732E-01	1.01183E+00	7.1041E-03	1.5744E+03	1.3824E+00	1.574E+03	6.582E+00
2.013709E-01	1.01065E+00	6.1595E-03	1.2769E+03	1.3651E+00	1.277E+03	6.157E+00
2.152655E-01	1.00957E+00	5.3367E-03	1.0349E+03	1.3451E+00	1.035E+03	5.760E+00
2.301188E-01	1.00859E+00	4.6205E-03	8.3821E+02	1.3225E+00	8.382E+02	5.388E+00
2.459970E-01	1.00771E+00	3.9976E-03	6.7840E+02	1.2976E+00	6.784E+02	5.040E+00
2.629708E-01	1.00691E+00	3.4563E-03	5.4868E+02	1.2705E+00	5.487E+02	4.715E+00
2.811158E-01	1.00618E+00	2.9863E-03	4.4347E+02	1.2415E+00	4.435E+02	4.410E+00
3.005128E-01	1.00553E+00	2.5785E-03	3.5820E+02	1.2108E+00	3.582E+02	4.126E+00
3.212482E-01	1.00494E+00	2.2249E-03	2.8913E+02	1.1785E+00	2.891E+02	3.859E+00
3.434143E-01	1.00441E+00	1.9186E-03	2.3324E+02	1.1450E+00	2.332E+02	3.610E+00
3.671099E-01	1.00394E+00	1.6535E-03	1.8803E+02	1.1104E+00	1.880E+02	3.377E+00
3.924405E-01	1.00351E+00	1.4241E-03	1.5149E+02	1.0749E+00	1.515E+02	3.159E+00
4.195189E-01	1.00313E+00	1.2258E-03	1.2198E+02	1.0388E+00	1.220E+02	2.955E+00
4.484657E-01	1.00279E+00	1.0545E-03	9.8162E+01	1.0024E+00	9.816E+01	2.765E+00
4.794098E-01	1.00248E+00	9.0664E-04	7.8949E+01	9.6568E-01	7.895E+01	2.586E+00
5.124891E-01	1.00220E+00	7.7906E-04	6.3461E+01	9.2900E-01	6.346E+01	2.419E+00
5.478508E-01	1.00196E+00	6.6907E-04	5.0983E+01	8.9253E-01	5.098E+01	2.263E+00
5.856525E-01	1.00174E+00	5.7430E-04	4.0937E+01	8.5644E-01	4.094E+01	2.117E+00
6.260625E-01	1.00154E+00	4.9270E-04	3.2854E+01	8.2092E-01	3.285E+01	1.980E+00
6.692609E-01	1.00137E+00	4.2248E-04	2.6353E+01	7.8612E-01	2.635E+01	1.853E+00
7.154399E-01	1.00121E+00	3.6208E-04	2.1128E+01	7.5220E-01	2.113E+01	1.733E+00
7.648052E-01	1.00108E+00	3.1017E-04	1.6931E+01	7.1928E-01	1.693E+01	1.621E+00
8.175768E-01	1.00095E+00	2.6558E-04	1.3561E+01	6.8749E-01	1.356E+01	1.516E+00
8.739896E-01	1.00084E+00	2.2730E-04	1.0857E+01	6.5694E-01	1.086E+01	1.419E+00
9.342948E-01	1.00075E+00	1.9444E-04	8.6881E+00	6.2773E-01	8.688E+00	1.327E+00
9.987612E-01	1.00066E+00	1.6627E-04	6.9496E+00	5.9992E-01	6.950E+00	1.241E+00
1.067676E+00	1.00058E+00	1.4211E-04	5.5566E+00	5.7360E-01	5.557E+00	1.161E+00
1.141345E+00	1.00052E+00	1.2142E-04	4.4410E+00	5.4880E-01	4.441E+00	1.086E+00
1.220098E+00	1.00046E+00	1.0370E-04	3.5480E+00	5.2557E-01	3.548E+00	1.016E+00
1.304285E+00	1.00040E+00	8.8528E-05	2.8335E+00	5.0394E-01	2.834E+00	9.506E-01
1.394281E+00	1.00036E+00	7.5550E-05	2.2620E+00	4.8391E-01	2.262E+00	8.892E-01
1.490486E+00	1.00031E+00	6.4451E-05	1.8052E+00	4.6548E-01	1.805E+00	8.318E-01
1.593329E+00	1.00028E+00	5.4965E-05	1.4401E+00	4.4866E-01	1.440E+00	7.781E-01
1.703269E+00	1.00024E+00	4.6859E-05	1.1485E+00	4.3341E-01	1.148E+00	7.279E-01
1.820795E+00	1.00022E+00	3.9935E-05	9.1562E-01	4.1970E-01	9.156E-01	6.809E-01
1.946430E+00	1.00019E+00	3.4025E-05	7.2975E-01	4.0750E-01	7.297E-01	6.370E-01
2.080733E+00	1.00017E+00	2.8980E-05	5.8144E-01	3.9676E-01	5.814E-01	5.959E-01
2.224304E+00	1.00015E+00	2.4677E-05	4.6314E-01	3.8743E-01	4.631E-01	5.574E-01
2.377781E+00	1.00013E+00	2.1007E-05	3.6881E-01	3.7944E-01	3.688E-01	5.214E-01
2.541848E+00	1.00011E+00	1.7878E-05	2.9362E-01	3.7272E-01	2.936E-01	4.878E-01
2.717235E+00	1.00010E+00	1.5211E-05	2.3370E-01	3.6721E-01	2.337E-01	4.563E-01
2.904724E+00	1.00009E+00	1.2940E-05	1.8597E-01	3.6283E-01	1.860E-01	4.268E-01
3.105150E+00	1.00008E+00	1.1005E-05	1.4795E-01	3.5950E-01	1.479E-01	3.993E-01
3.319406E+00	1.00007E+00	9.3572E-06	1.1768E-01	3.5714E-01	1.177E-01	3.735E-01
3.548445E+00	1.00006E+00	7.9549E-06	9.3586E-02	3.5567E-01	9.359E-02	3.494E-01
3.793288E+00	1.00005E+00	6.7615E-06	7.4412E-02	3.5500E-01	7.441E-02	3.269E-01
4.055024E+00	1.00005E+00	5.7461E-06	5.9156E-02	3.5506E-01	5.916E-02	3.058E-01
4.334821E+00	1.00004E+00	4.8825E-06	4.7021E-02	3.5575E-01	4.702E-02	2.860E-01

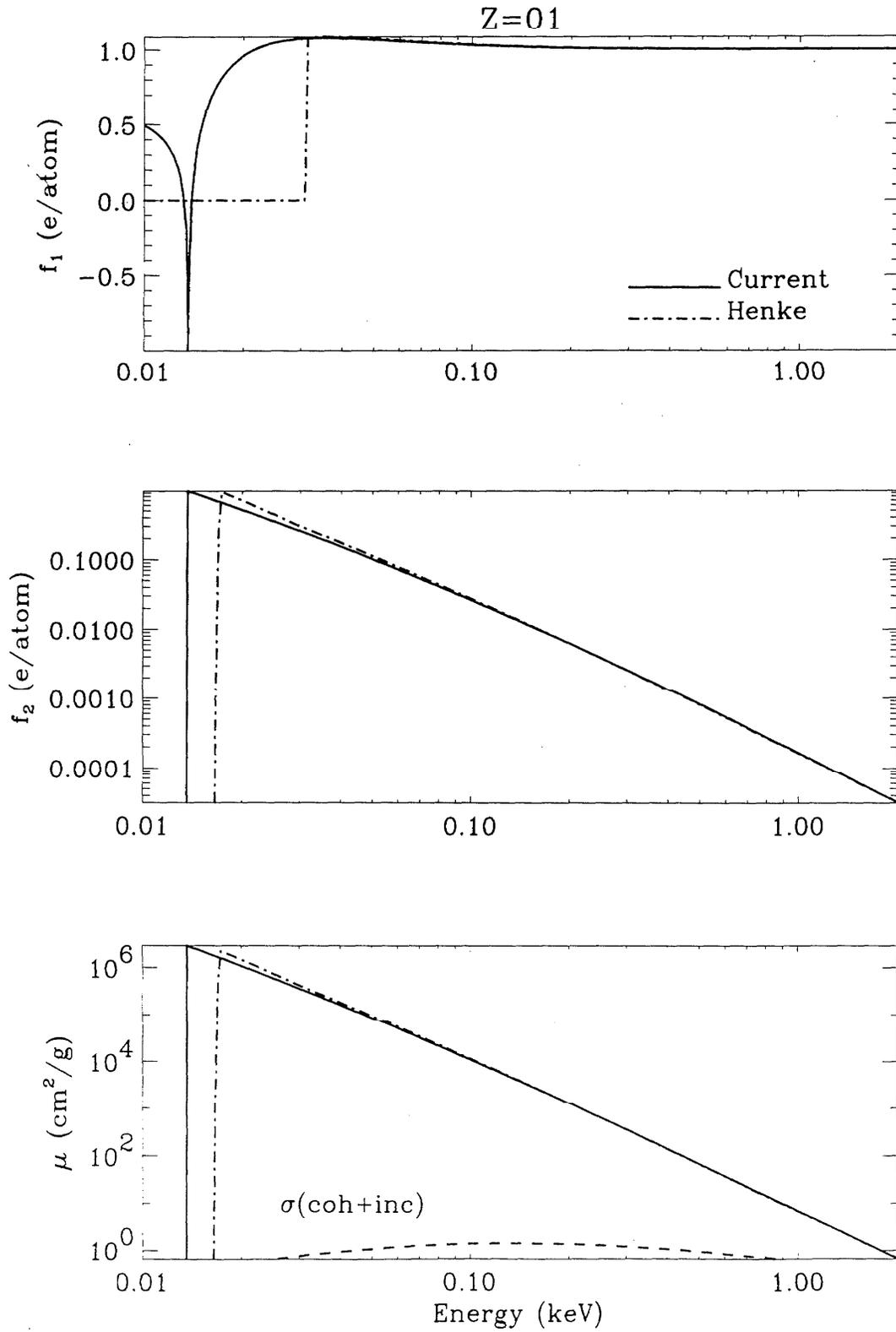
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 85

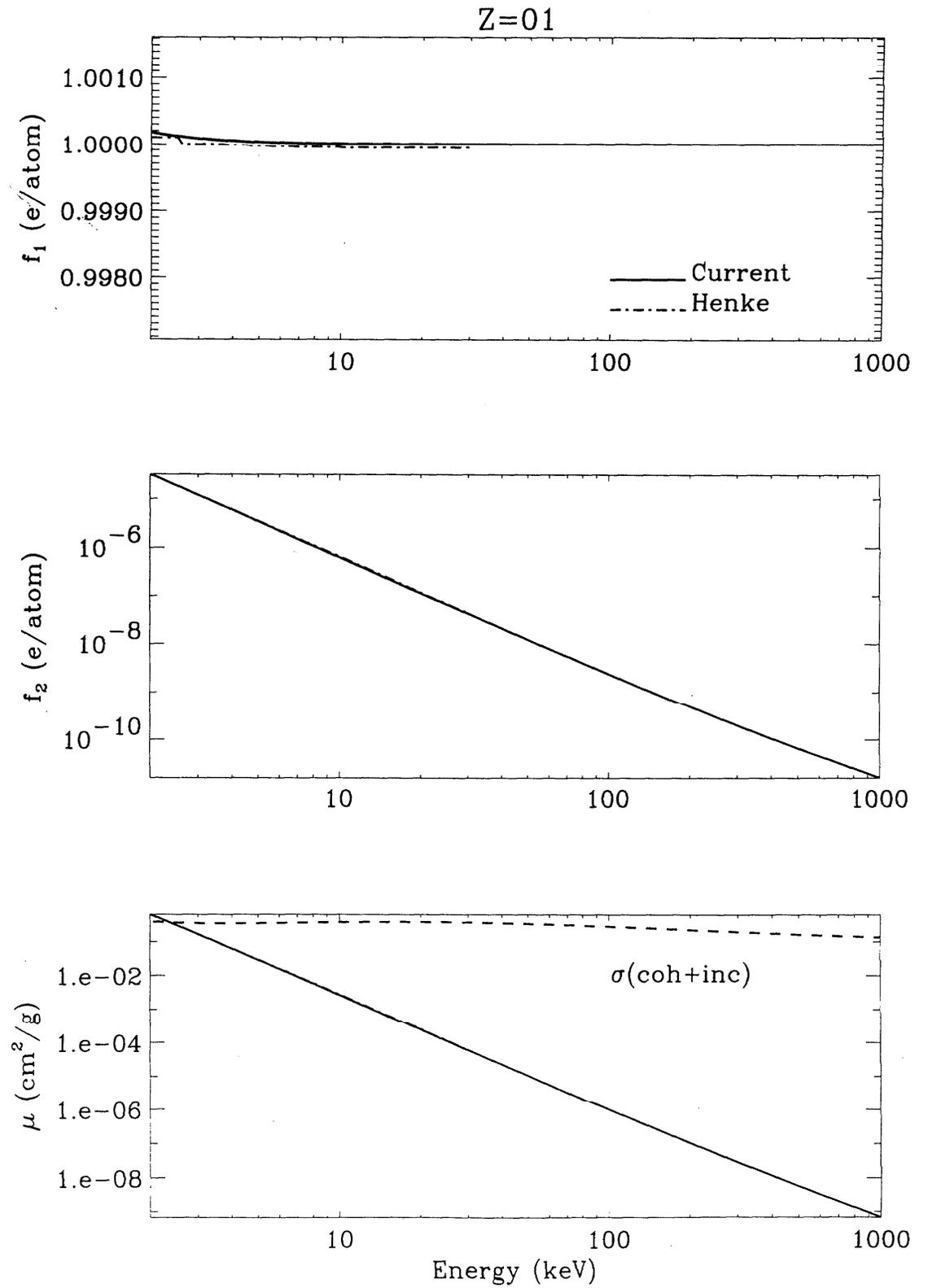
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(colt+inc) cm ² /g	μ _K cm ² /g	λ nm
6.058959E-02	1.05510E+00	7.1034E-02	4.8943E+04	1.1995E+00	4.894E+04	2.046E+01
6.477028E-02	1.05134E+00	6.2473E-02	4.0265E+04	1.2336E+00	4.027E+04	1.914E+01
5.295467E+00	1.00003E+00	2.9930E-06	2.3595E-02	3.6084E-01	2.359E-02	2.341E-01
5.660855E+00	1.00002E+00	2.5419E-06	1.8745E-02	3.6328E-01	1.875E-02	2.190E-01
6.051453E+00	1.00002E+00	2.1586E-06	1.4891E-02	3.6596E-01	1.489E-02	2.049E-01
6.469004E+00	1.00002E+00	1.8330E-06	1.1829E-02	3.6882E-01	1.183E-02	1.917E-01
6.915365E+00	1.00002E+00	1.5564E-06	9.3954E-03	3.7180E-01	9.395E-03	1.793E-01
7.392525E+00	1.00001E+00	1.3214E-06	7.4622E-03	3.7482E-01	7.462E-03	1.677E-01
7.902609E+00	1.00001E+00	1.1219E-06	5.9266E-03	3.7783E-01	5.927E-03	1.569E-01
8.447890E+00	1.00001E+00	9.5248E-07	4.7068E-03	3.8077E-01	4.707E-03	1.468E-01
9.030794E+00	1.00001E+00	8.0863E-07	3.7380E-03	3.8360E-01	3.738E-03	1.373E-01
9.653919E+00	1.00001E+00	6.8651E-07	2.9687E-03	3.8627E-01	2.969E-03	1.284E-01
1.032004E+01	1.00001E+00	5.8283E-07	2.3577E-03	3.8874E-01	2.358E-03	1.201E-01
1.103212E+01	1.00001E+00	4.9482E-07	1.8724E-03	3.9097E-01	1.872E-03	1.124E-01
1.179334E+01	1.00001E+00	4.2012E-07	1.4872E-03	3.9293E-01	1.487E-03	1.051E-01
1.260708E+01	1.00001E+00	3.5671E-07	1.1812E-03	3.9459E-01	1.181E-03	9.834E-02
1.347697E+01	1.00000E+00	3.0289E-07	9.3824E-04	3.9593E-01	9.382E-04	9.200E-02
1.440688E+01	1.00000E+00	2.5721E-07	7.4532E-04	3.9693E-01	7.453E-04	8.606E-02
1.540095E+01	1.00000E+00	2.1844E-07	5.9211E-04	3.9757E-01	5.921E-04	8.050E-02
1.646362E+01	1.00000E+00	1.8553E-07	4.7044E-04	3.9784E-01	4.704E-04	7.531E-02
1.759961E+01	1.00000E+00	1.5760E-07	3.7382E-04	3.9773E-01	3.738E-04	7.045E-02
1.881398E+01	1.00000E+00	1.3389E-07	2.9708E-04	3.9725E-01	2.971E-04	6.590E-02
2.011215E+01	1.00000E+00	1.1376E-07	2.3612E-04	3.9638E-01	2.361E-04	6.165E-02
2.149988E+01	1.00000E+00	9.6669E-08	1.8770E-04	3.9513E-01	1.877E-04	5.767E-02
2.298338E+01	1.00000E+00	8.2161E-08	1.4924E-04	3.9350E-01	1.492E-04	5.395E-02
2.456923E+01	1.00000E+00	6.9843E-08	1.1867E-04	3.9150E-01	1.187E-04	5.046E-02
2.626450E+01	1.00000E+00	5.9383E-08	9.4387E-05	3.8914E-01	9.439E-05	4.721E-02
2.807676E+01	1.00000E+00	5.0499E-08	7.5086E-05	3.8643E-01	7.509E-05	4.416E-02
3.001405E+01	1.00000E+00	4.2954E-08	5.9744E-05	3.8338E-01	5.974E-05	4.131E-02
3.208502E+01	1.00000E+00	3.6544E-08	4.7548E-05	3.8001E-01	4.755E-05	3.864E-02
3.429889E+01	1.00000E+00	3.1098E-08	3.7851E-05	3.7633E-01	3.785E-05	3.615E-02
3.666551E+01	1.00000E+00	2.6471E-08	3.0139E-05	3.7236E-01	3.014E-05	3.381E-02
3.919543E+01	1.00000E+00	2.2537E-08	2.4004E-05	3.6812E-01	2.400E-05	3.163E-02
4.189992E+01	1.00000E+00	1.9194E-08	1.9124E-05	3.6362E-01	1.912E-05	2.959E-02
4.479101E+01	1.00000E+00	1.6351E-08	1.5240E-05	3.5889E-01	1.524E-05	2.768E-02
4.788159E+01	1.00000E+00	1.3934E-08	1.2148E-05	3.5395E-01	1.215E-05	2.589E-02
5.118542E+01	1.00000E+00	1.1877E-08	9.6871E-06	3.4880E-01	9.687E-06	2.422E-02
5.471721E+01	1.00000E+00	1.0128E-08	7.7211E-06	3.4349E-01	7.727E-06	2.266E-02
5.849270E+01	1.00000E+00	8.6390E-09	6.1657E-06	3.3801E-01	6.166E-06	2.120E-02
6.252870E+01	1.00000E+00	7.3715E-09	4.9215E-06	3.3240E-01	4.922E-06	1.983E-02
6.684318E+01	1.00000E+00	6.2923E-09	3.9298E-06	3.2668E-01	3.930E-06	1.855E-02
7.145536E+01	1.00000E+00	5.3732E-09	3.1392E-06	3.2085E-01	3.139E-06	1.735E-02
7.638578E+01	1.00000E+00	4.5901E-09	2.5086E-06	3.1494E-01	2.509E-06	1.623E-02
8.165640E+01	1.00000E+00	3.9227E-09	2.0054E-06	3.0898E-01	2.005E-06	1.518E-02
8.729069E+01	1.00000E+00	3.3537E-09	1.6039E-06	3.0296E-01	1.604E-06	1.420E-02
9.331374E+01	1.00000E+00	2.8685E-09	1.2833E-06	2.9691E-01	1.283E-06	1.329E-02
9.975239E+01	1.00000E+00	2.4545E-09	1.0272E-06	2.9086E-01	1.027E-06	1.243E-02
1.066353E+02	1.00000E+00	2.1013E-09	8.2263E-07	2.8480E-01	8.226E-07	1.163E-02
1.139931E+02	1.00000E+00	1.7997E-09	6.5909E-07	2.7875E-01	6.591E-07	1.088E-02
1.218587E+02	1.00000E+00	1.5422E-09	5.2832E-07	2.7274E-01	5.283E-07	1.017E-02
1.302669E+02	1.00000E+00	1.3221E-09	4.2370E-07	2.6676E-01	4.237E-07	9.518E-03
1.392553E+02	1.00000E+00	1.1341E-09	3.3997E-07	2.6083E-01	3.400E-07	8.903E-03
1.488640E+02	1.00000E+00	9.7323E-10	2.7293E-07	2.5497E-01	2.729E-07	8.329E-03
1.591356E+02	1.00000E+00	8.3566E-10	2.1922E-07	2.4918E-01	2.192E-07	7.791E-03
1.701159E+02	1.00000E+00	7.1792E-10	1.7618E-07	2.4346E-01	1.762E-07	7.288E-03
1.818539E+02	1.00000E+00	6.1711E-10	1.4166E-07	2.3784E-01	1.417E-07	6.818E-03
1.944018E+02	1.00000E+00	5.3076E-10	1.1398E-07	2.3231E-01	1.140E-07	6.378E-03
2.078156E+02	1.00000E+00	4.5676E-10	9.1755E-08	2.2689E-01	9.175E-08	5.966E-03
2.221548E+02	1.00000E+00	3.9331E-10	7.3908E-08	2.2157E-01	7.391E-08	5.581E-03
2.374835E+02	1.00000E+00	3.3887E-10	5.9569E-08	2.1637E-01	5.957E-08	5.221E-03
2.538699E+02	1.00000E+00	2.9216E-10	4.8042E-08	2.1129E-01	4.804E-08	4.884E-03
2.713869E+02	1.00000E+00	2.5204E-10	3.8770E-08	2.0633E-01	3.877E-08	4.569E-03
2.901126E+02	1.00000E+00	2.1757E-10	3.1307E-08	2.0150E-01	3.131E-08	4.274E-03
3.101304E+02	1.00000E+00	1.8793E-10	2.5798E-08	1.9680E-01	2.530E-08	3.998E-03
3.315294E+02	1.00000E+00	1.6245E-10	2.0455E-08	1.9223E-01	2.046E-08	3.740E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
3.544049E+02	1.00000E+00	1.4051E-10	1.6551E-08	1.8779E-01	1.655E-08	3.498E-03
3.788588E+02	1.00000E+00	1.2162E-10	1.3401E-08	1.8349E-01	1.340E-08	3.273E-03
4.050001E+02	1.00000E+00	1.0534E-10	1.0859E-08	1.7933E-01	1.086E-08	3.061E-03
4.329451E+02	1.00000E+00	9.1313E-11	8.8048E-09	1.7530E-01	8.805E-09	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 89

He Z = 2

Atomic weight = 4.003000E+00 g/mol, nominal density ρ (g/cm³) = 1.6640E-04

μ_A (barns/atom) = μ (cm²/g) \times 6.64714E+00, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.05122E+07

Edge. K Edge energy (keV) = 2.46000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -4.2952E-04, 0.0000E+00 e/atom

Nuclear Thomson correction f_{NT} = -5.4817E-04 e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	8.09152E-01	0.0000E+00	0.0000E+00	1.2498E-05	0.000E+00	1.160E+02
1.142761E-02	7.94174E-01	0.0000E+00	0.0000E+00	1.7671E-05	0.000E+00	1.085E+02
1.221612E-02	7.76288E-01	0.0000E+00	0.0000E+00	2.4815E-05	0.000E+00	1.015E+02
1.305903E-02	7.54752E-01	0.0000E+00	0.0000E+00	3.4613E-05	0.000E+00	9.494E+01
1.396010E-02	7.28554E-01	0.0000E+00	0.0000E+00	4.7958E-05	0.000E+00	8.881E+01
1.492335E-02	6.96270E-01	0.0000E+00	0.0000E+00	6.6005E-05	0.000E+00	8.308E+01
1.595306E-02	6.55815E-01	0.0000E+00	0.0000E+00	9.0244E-05	0.000E+00	7.772E+01
1.705382E-02	6.03976E-01	0.0000E+00	0.0000E+00	1.2258E-04	0.000E+00	7.270E+01
1.823053E-02	5.35466E-01	0.0000E+00	0.0000E+00	1.6541E-04	0.000E+00	6.801E+01
1.948844E-02	4.40723E-01	0.0000E+00	0.0000E+00	2.2177E-04	0.000E+00	6.362E+01
2.083314E-02	2.99815E-01	0.0000E+00	0.0000E+00	2.9543E-04	0.000E+00	5.951E+01
2.227063E-02	5.95946E-02	0.0000E+00	0.0000E+00	3.9106E-04	0.000E+00	5.567E+01
2.380730E-02	-5.37052E-01	0.0000E+00	0.0000E+00	5.1437E-04	0.000E+00	5.208E+01
2.410800E-02	-8.18127E-01	0.0000E+00	0.0000E+00	5.4121E-04	0.000E+00	5.143E+01
2.447700E-02	-1.66675E+00	0.0000E+00	0.0000E+00	5.7539E-04	0.000E+00	5.065E+01
2.457540E-02	-2.67916E+00	0.0000E+00	0.0000E+00	5.8474E-04	0.000E+00	5.045E+01
2.472300E-02	-1.63405E+00	1.9911E+00	8.4663E+05	5.9896E-04	8.466E+05	5.015E+01
2.509200E-02	-7.18902E-01	1.9648E+00	8.2316E+05	6.3550E-04	8.232E+05	4.941E+01
2.545001E-02	-3.46603E-01	1.9399E+00	8.0128E+05	6.7233E-04	8.013E+05	4.872E+01
2.720606E-02	4.44157E-01	1.8248E+00	7.0509E+05	8.7333E-04	7.051E+05	4.557E+01
2.908327E-02	8.35659E-01	1.7138E+00	6.1945E+05	1.1274E-03	6.194E+05	4.263E+01
3.109002E-02	1.09847E+00	1.6069E+00	5.4334E+05	1.4465E-03	5.433E+05	3.988E+01
3.323523E-02	1.29391E+00	1.5043E+00	4.7581E+05	1.8447E-03	4.758E+05	3.731E+01
3.552846E-02	1.44669E+00	1.4060E+00	4.1601E+05	2.3383E-03	4.160E+05	3.490E+01
3.797993E-02	1.56954E+00	1.3120E+00	3.6314E+05	2.9463E-03	3.631E+05	3.264E+01
4.060054E-02	1.66999E+00	1.2223E+00	3.1648E+05	3.6904E-03	3.165E+05	3.054E+01
4.340198E-02	1.75296E+00	1.1369E+00	2.7537E+05	4.5951E-03	2.754E+05	2.857E+01
4.639671E-02	1.82186E+00	1.0558E+00	2.3922E+05	5.6883E-03	2.392E+05	2.672E+01
4.959809E-02	1.87923E+00	9.7893E-01	2.0748E+05	7.0008E-03	2.075E+05	2.500E+01
5.302035E-02	1.92697E+00	9.0618E-01	1.7967E+05	8.5668E-03	1.797E+05	2.338E+01
5.667876E-02	1.96660E+00	8.3748E-01	1.5533E+05	1.0423E-02	1.553E+05	2.187E+01
6.058959E-02	1.99934E+00	7.7275E-01	1.3407E+05	1.2611E-02	1.341E+05	2.046E+01
6.477028E-02	2.02621E+00	7.1188E-01	1.1554E+05	1.5172E-02	1.155E+05	1.914E+01
6.923942E-02	2.04803E+00	6.5476E-01	9.9407E+04	1.8152E-02	9.941E+04	1.791E+01
7.401695E-02	2.06555E+00	6.0124E-01	8.5391E+04	2.1598E-02	8.539E+04	1.675E+01
7.912411E-02	2.07934E+00	5.5122E-01	7.3234E+04	2.5558E-02	7.323E+04	1.567E+01
8.458368E-02	2.08994E+00	5.0455E-01	6.2706E+04	3.0081E-02	6.271E+04	1.466E+01
9.041995E-02	2.09782E+00	4.6109E-01	5.3606E+04	3.5214E-02	5.361E+04	1.371E+01
9.665893E-02	2.10336E+00	4.2069E-01	4.5753E+04	4.1005E-02	4.575E+04	1.283E+01
1.033284E-01	2.10693E+00	3.8322E-01	3.8987E+04	4.7497E-02	3.899E+04	1.200E+01
1.104581E-01	2.10882E+00	3.4853E-01	3.3169E+04	5.4731E-02	3.317E+04	1.122E+01
1.180797E-01	2.10930E+00	3.1646E-01	2.8174E+04	6.2741E-02	2.817E+04	1.050E+01
1.262272E-01	2.10861E+00	2.8689E-01	2.3892E+04	7.1555E-02	2.389E+04	9.822E+00
1.349368E-01	2.10695E+00	2.5966E-01	2.0229E+04	8.1195E-02	2.023E+04	9.188E+00
1.442475E-01	2.10451E+00	2.3464E-01	1.7100E+04	9.1671E-02	1.710E+04	8.595E+00
1.542005E-01	2.10143E+00	2.1169E-01	1.4431E+04	1.0298E-01	1.443E+04	8.040E+00
1.648404E-01	2.09787E+00	1.9068E-01	1.2160E+04	1.1513E-01	1.216E+04	7.521E+00
1.762144E-01	2.09393E+00	1.7148E-01	1.0230E+04	1.2807E-01	1.023E+04	7.036E+00
1.883732E-01	2.08972E+00	1.5396E-01	8.5918E+03	1.4179E-01	8.592E+03	6.582E+00
2.013709E-01	2.08533E+00	1.3801E-01	7.2047E+03	1.5623E-01	7.205E+03	6.157E+00
2.152655E-01	2.08083E+00	1.2352E-01	6.0318E+03	1.7132E-01	6.032E+03	5.760E+00
2.301188E-01	2.07628E+00	1.1037E-01	5.0418E+03	1.8700E-01	5.042E+03	5.388E+00
2.459970E-01	2.07175E+00	9.8459E-02	4.2075E+03	2.0317E-01	4.207E+03	5.040E+00
2.629708E-01	2.06727E+00	8.7695E-02	3.5056E+03	2.1973E-01	3.506E+03	4.715E+00
2.811158E-01	2.06289E+00	7.7982E-02	2.9161E+03	2.3656E-01	2.916E+03	4.410E+00

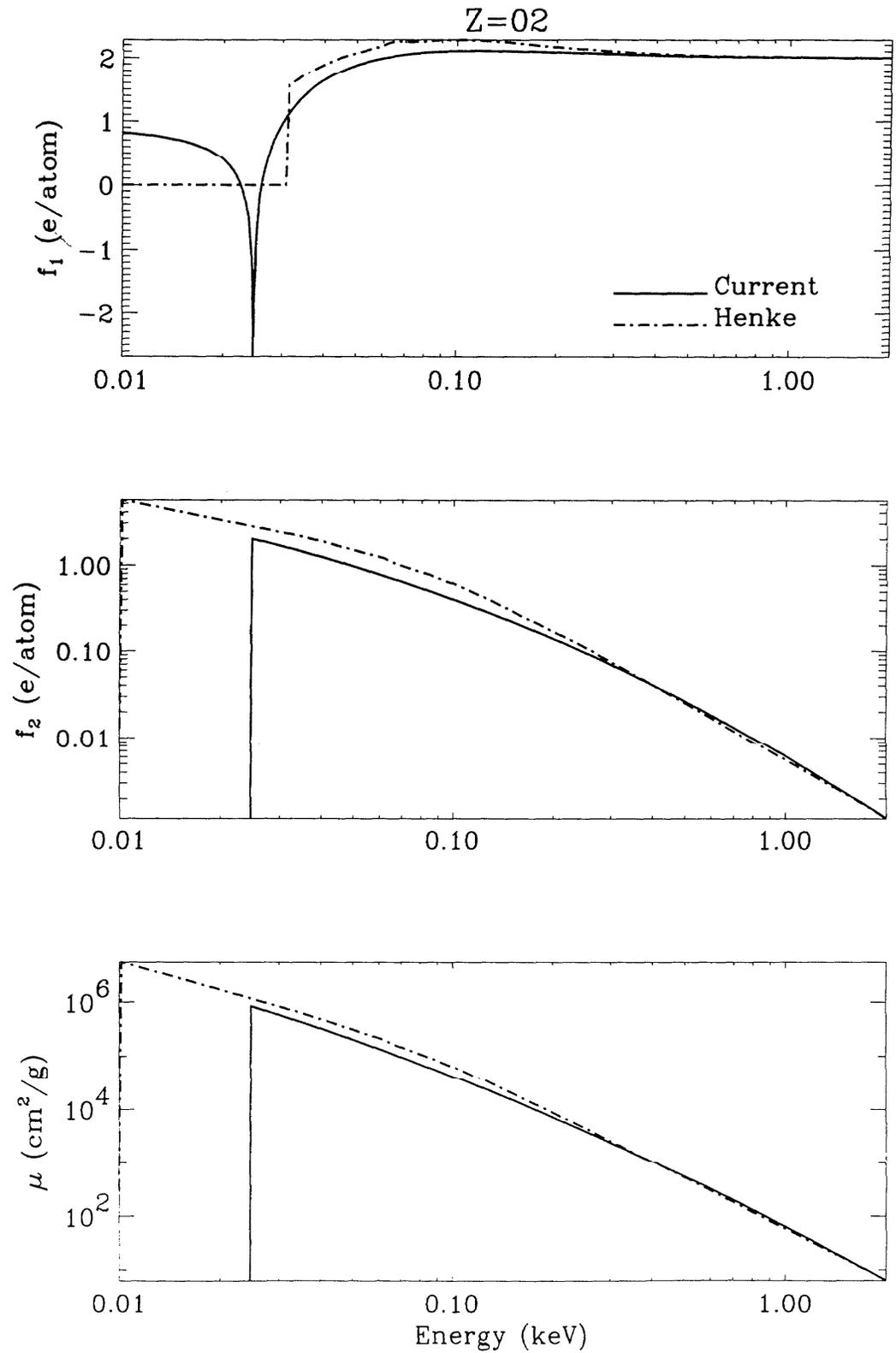
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

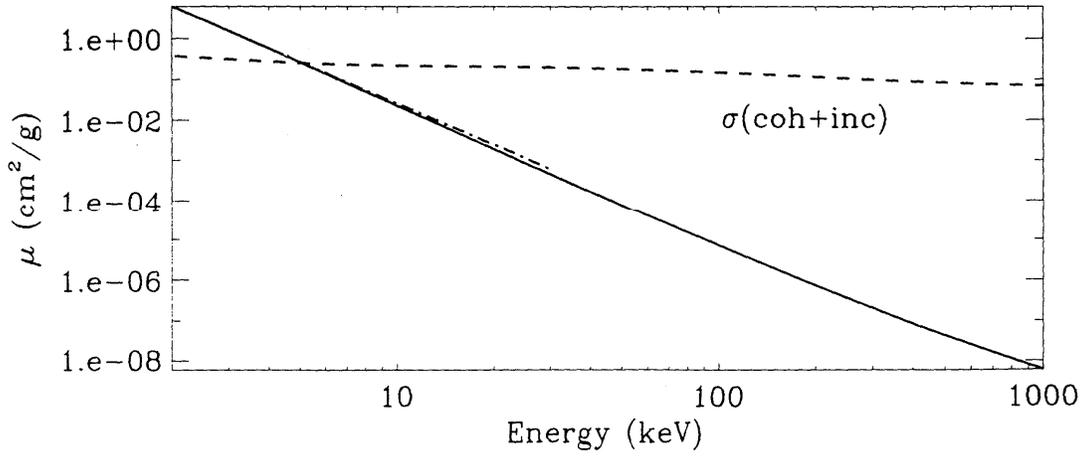
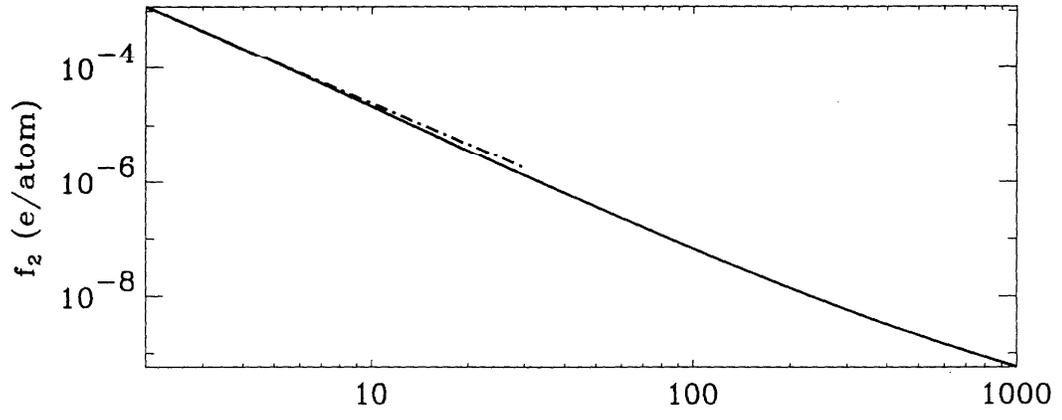
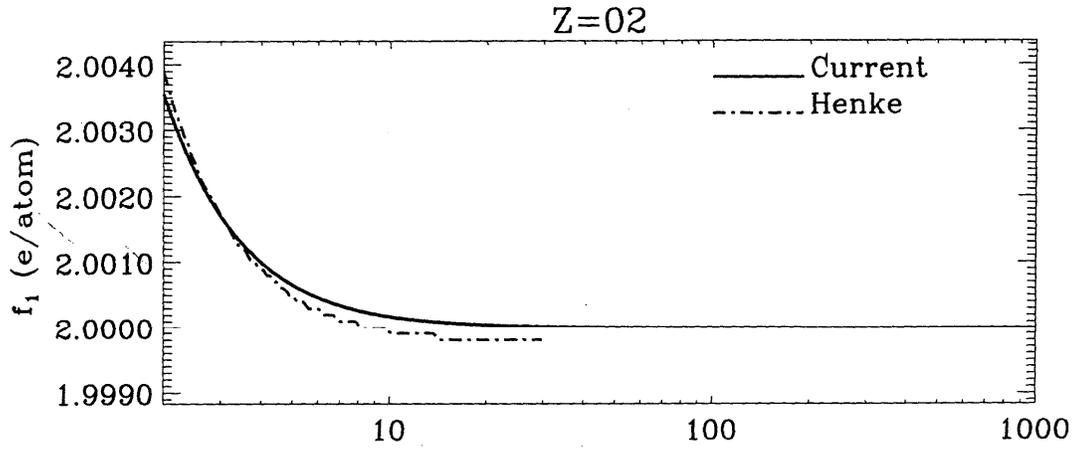
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
3.005128E-01	2.05862E+00	6.9233E-02	2.4218E+03	2.5355E-01	2.422E+03	4.126E+00
3.212482E-01	2.05450E+00	6.1368E-02	2.0081E+03	2.7057E-01	2.008E+03	3.859E+00
3.434143E-01	2.05053E+00	5.4308E-02	1.6624E+03	2.8747E-01	1.662E+03	3.610E+00
3.671099E-01	2.04675E+00	4.7984E-02	1.3740E+03	3.0411E-01	1.374E+03	3.377E+00
3.924405E-01	2.04315E+00	4.2328E-02	1.1338E+03	3.2036E-01	1.134E+03	3.159E+00
4.195189E-01	2.03973E+00	3.7279E-02	9.3412E+02	3.3606E-01	9.341E+02	2.955E+00
4.484657E-01	2.03651E+00	3.2779E-02	7.6835E+02	3.5107E-01	7.684E+02	2.765E+00
4.794098E-01	2.03349E+00	2.8776E-02	6.3099E+02	3.6527E-01	6.310E+02	2.586E+00
5.124891E-01	2.03065E+00	2.5222E-02	5.1735E+02	3.7852E-01	5.173E+02	2.419E+00
5.478508E-01	2.02800E+00	2.2071E-02	4.2350E+02	3.9071E-01	4.235E+02	2.263E+00
5.856525E-01	2.02553E+00	1.9283E-02	3.4611E+02	4.0173E-01	3.461E+02	2.117E+00
6.260625E-01	2.02324E+00	1.6819E-02	2.8241E+02	4.1150E-01	2.824E+02	1.980E+00
6.692609E-01	2.02112E+00	1.4647E-02	2.3007E+02	4.1993E-01	2.301E+02	1.853E+00
7.154399E-01	2.01917E+00	1.2735E-02	1.8713E+02	4.2697E-01	1.871E+02	1.733E+00
7.648052E-01	2.01736E+00	1.1055E-02	1.5195E+02	4.3257E-01	1.520E+02	1.621E+00
8.175768E-01	2.01570E+00	9.5814E-03	1.2319E+02	4.3673E-01	1.232E+02	1.516E+00
8.739896E-01	2.01418E+00	8.2906E-03	9.9718E+01	4.3942E-01	9.972E+01	1.419E+00
9.342948E-01	2.01279E+00	7.1622E-03	8.0586E+01	4.4068E-01	8.059E+01	1.327E+00
9.987612E-01	2.01152E+00	6.1775E-03	6.5020E+01	4.4052E-01	6.502E+01	1.241E+00
1.067676E+00	2.01036E+00	5.3000E-03	5.2183E+01	4.3901E-01	5.218E+01	1.161E+00
1.141345E+00	2.00929E+00	4.5425E-03	4.1838E+01	4.3619E-01	4.184E+01	1.086E+00
1.220098E+00	2.00833E+00	3.8898E-03	3.3514E+01	4.3216E-01	3.351E+01	1.016E+00
1.304285E+00	2.00745E+00	3.3280E-03	2.6823E+01	4.2699E-01	2.682E+01	9.506E-01
1.394281E+00	2.00665E+00	2.8448E-03	2.1449E+01	4.2080E-01	2.145E+01	8.892E-01
1.490486E+00	2.00594E+00	2.4298E-03	1.7137E+01	4.1369E-01	1.714E+01	8.318E-01
1.593329E+00	2.00529E+00	2.0737E-03	1.3682E+01	4.0578E-01	1.368E+01	7.781E-01
1.703269E+00	2.00471E+00	1.7684E-03	1.0914E+01	3.9719E-01	1.091E+01	7.279E-01
1.820795E+00	2.00419E+00	1.5069E-03	8.7002E+00	3.8804E-01	8.700E+00	6.809E-01
1.946430E+00	2.00373E+00	1.2832E-03	6.9302E+00	3.7845E-01	6.930E+00	6.370E-01
2.080733E+00	2.00331E+00	1.0919E-03	5.5165E+00	3.6855E-01	5.516E+00	5.959E-01
2.224304E+00	2.00294E+00	9.2851E-04	4.3882E+00	3.5844E-01	4.388E+00	5.574E-01
2.377781E+00	2.00260E+00	7.8905E-04	3.4884E+00	3.4825E-01	3.488E+00	5.214E-01
2.541848E+00	2.00231E+00	6.7012E-04	2.7714E+00	3.3807E-01	2.771E+00	4.878E-01
2.717235E+00	2.00204E+00	5.6878E-04	2.2005E+00	3.2801E-01	2.200E+00	4.563E-01
2.904724E+00	2.00181E+00	4.8249E-04	1.7461E+00	3.1816E-01	1.746E+00	4.268E-01
3.105150E+00	2.00160E+00	4.0907E-04	1.3849E+00	3.0858E-01	1.385E+00	3.993E-01
3.319406E+00	2.00141E+00	3.4664E-04	1.0978E+00	2.9936E-01	1.098E+00	3.735E-01
3.548445E+00	2.00125E+00	2.9360E-04	8.6978E-01	2.9055E-01	8.698E-01	3.494E-01
3.793288E+00	2.00110E+00	2.4855E-04	6.8881E-01	2.8220E-01	6.888E-01	3.269E-01
4.055024E+00	2.00097E+00	2.1033E-04	5.4525E-01	2.7435E-01	5.453E-01	3.058E-01
4.334821E+00	2.00086E+00	1.7791E-04	4.3144E-01	2.6703E-01	4.314E-01	2.860E-01
4.633924E+00	2.00076E+00	1.5043E-04	3.4124E-01	2.6024E-01	3.412E-01	2.676E-01
4.953664E+00	2.00067E+00	1.2714E-04	2.6981E-01	2.5401E-01	2.698E-01	2.503E-01
5.295467E+00	2.00059E+00	1.0743E-04	2.1326E-01	2.4832E-01	2.133E-01	2.341E-01
5.660855E+00	2.00052E+00	9.0740E-05	1.6850E-01	2.4318E-01	1.685E-01	2.190E-01
6.051453E+00	2.00046E+00	7.6624E-05	1.3311E-01	2.3857E-01	1.331E-01	2.049E-01
6.469004E+00	2.00040E+00	6.4687E-05	1.0512E-01	2.3446E-01	1.051E-01	1.917E-01
6.915365E+00	2.00035E+00	5.4596E-05	8.2993E-02	2.3083E-01	8.299E-02	1.793E-01
7.392525E+00	2.00031E+00	4.6070E-05	6.5512E-02	2.2764E-01	6.551E-02	1.677E-01
7.902609E+00	2.00027E+00	3.8868E-05	5.1704E-02	2.2487E-01	5.170E-02	1.569E-01
8.447890E+00	2.00024E+00	3.2787E-05	4.0799E-02	2.2247E-01	4.080E-02	1.468E-01
9.030794E+00	2.00021E+00	2.7654E-05	3.2190E-02	2.2040E-01	3.219E-02	1.373E-01
9.653919E+00	2.00019E+00	2.3322E-05	2.5395E-02	2.1863E-01	2.540E-02	1.284E-01
1.032004E+01	2.00016E+00	1.9667E-05	2.0033E-02	2.1711E-01	2.003E-02	1.201E-01
1.103212E+01	2.00014E+00	1.6584E-05	1.5802E-02	2.1580E-01	1.580E-02	1.124E-01
1.179334E+01	2.00013E+00	1.3984E-05	1.2465E-02	2.1466E-01	1.246E-02	1.051E-01
1.260708E+01	2.00011E+00	1.1791E-05	9.8319E-03	2.1365E-01	9.832E-03	9.834E-02
1.347697E+01	2.00010E+00	9.9427E-06	7.7554E-03	2.1273E-01	7.755E-03	9.200E-02
1.440688E+01	2.00009E+00	8.3843E-06	6.1177E-03	2.1187E-01	6.118E-03	8.606E-02
1.540095E+01	2.00007E+00	7.0708E-06	4.8263E-03	2.1104E-01	4.826E-03	8.050E-02
1.646362E+01	2.00007E+00	5.9636E-06	3.8078E-03	2.1020E-01	3.808E-03	7.531E-02
1.759961E+01	2.00006E+00	5.0304E-06	3.0047E-03	2.0933E-01	3.005E-03	7.045E-02
1.881398E+01	2.00005E+00	4.2439E-06	2.3713E-03	2.0841E-01	2.371E-03	6.590E-02
2.011215E+01	2.00004E+00	3.5810E-06	1.8717E-03	2.0740E-01	1.872E-03	6.165E-02
2.149968E+01	2.00004E+00	3.0223E-06	1.4777E-03	2.0631E-01	1.478E-03	5.767E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 91

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.298338E+01	2.00003E+00	2.5513E-06	1.1669E-03	2.0510E-01	1.167E-03	5.395E-02
2.456923E+01	2.00003E+00	2.1543E-06	9.2172E-04	2.0377E-01	9.217E-04	5.046E-02
2.626450E+01	2.00003E+00	1.8195E-06	7.2825E-04	2.0231E-01	7.283E-04	4.721E-02
2.807676E+01	2.00002E+00	1.5373E-06	5.7557E-04	2.0071E-01	5.756E-04	4.416E-02
3.001405E+01	2.00002E+00	1.2992E-06	4.5505E-04	1.9896E-01	4.550E-04	4.131E-02
3.208502E+01	2.00002E+00	1.0984E-06	3.5989E-04	1.9707E-01	3.599E-04	3.864E-02
3.429889E+01	2.00002E+00	9.2904E-07	2.8474E-04	1.9504E-01	2.847E-04	3.615E-02
3.666551E+01	2.00001E+00	7.8609E-07	2.2538E-04	1.9287E-01	2.254E-04	3.381E-02
3.919543E+01	2.00001E+00	6.6542E-07	1.7847E-04	1.9055E-01	1.785E-04	3.163E-02
4.189992E+01	2.00001E+00	5.6354E-07	1.4138E-04	1.8811E-01	1.414E-04	2.959E-02
4.479101E+01	2.00001E+00	4.7748E-07	1.1206E-04	1.8554E-01	1.121E-04	2.768E-02
4.788159E+01	2.00001E+00	4.0478E-07	8.8867E-05	1.8284E-01	8.887E-05	2.589E-02
5.118542E+01	2.00001E+00	3.4333E-07	7.0511E-05	1.8004E-01	7.051E-05	2.422E-02
5.471721E+01	2.00001E+00	2.9137E-07	5.5978E-05	1.7714E-01	5.598E-05	2.266E-02
5.849270E+01	2.00001E+00	2.4742E-07	4.4466E-05	1.7415E-01	4.447E-05	2.120E-02
6.252870E+01	2.00000E+00	2.1023E-07	3.5344E-05	1.7108E-01	3.534E-05	1.983E-02
6.684318E+01	2.00000E+00	1.7875E-07	2.8111E-05	1.6794E-01	2.811E-05	1.855E-02
7.145536E+01	2.00000E+00	1.5208E-07	2.2373E-05	1.6474E-01	2.237E-05	1.735E-02
7.638578E+01	2.00000E+00	1.2948E-07	1.7819E-05	1.6149E-01	1.782E-05	1.623E-02
8.165640E+01	2.00000E+00	1.1032E-07	1.4202E-05	1.5821E-01	1.420E-05	1.518E-02
8.729069E+01	2.00000E+00	9.4059E-08	1.1327E-05	1.5490E-01	1.133E-05	1.420E-02
9.331374E+01	2.00000E+00	8.0260E-08	9.0416E-06	1.5158E-01	9.042E-06	1.329E-02
9.975239E+01	2.00000E+00	6.8540E-08	7.2229E-06	1.4825E-01	7.223E-06	1.243E-02
1.066353E+02	2.00000E+00	5.8579E-08	5.7748E-06	1.4492E-01	5.775E-06	1.163E-02
1.139931E+02	2.00000E+00	5.0108E-08	4.6209E-06	1.4160E-01	4.621E-06	1.088E-02
1.218587E+02	2.00000E+00	4.2900E-08	3.7008E-06	1.3830E-01	3.701E-06	1.017E-02
1.302669E+02	2.00000E+00	3.6762E-08	2.9666E-06	1.3504E-01	2.967E-06	9.518E-03
1.392553E+02	2.00000E+00	3.1531E-08	2.3802E-06	1.3181E-01	2.380E-06	8.903E-03
1.488640E+02	2.00000E+00	2.7070E-08	1.9116E-06	1.2862E-01	1.912E-06	8.329E-03
1.591356E+02	2.00000E+00	2.3263E-08	1.5367E-06	1.2548E-01	1.537E-06	7.791E-03
1.701159E+02	2.00000E+00	2.0011E-08	1.2366E-06	1.2240E-01	1.237E-06	7.288E-03
1.818539E+02	2.00000E+00	1.7232E-08	9.9608E-07	1.1937E-01	9.961E-07	6.818E-03
1.944018E+02	2.00000E+00	1.4854E-08	8.0321E-07	1.1641E-01	8.032E-07	6.378E-03
2.078156E+02	2.00000E+00	1.2818E-08	6.4839E-07	1.1353E-01	6.484E-07	5.966E-03
2.221548E+02	2.00000E+00	1.1073E-08	5.2398E-07	1.1071E-01	5.240E-07	5.581E-03
2.374835E+02	2.00000E+00	9.5771E-09	4.2393E-07	1.0797E-01	4.239E-07	5.221E-03
2.538699E+02	2.00000E+00	8.2925E-09	3.4337E-07	1.0531E-01	3.434E-07	4.884E-03
2.713869E+02	2.00000E+00	7.1887E-09	2.7846E-07	1.0273E-01	2.785E-07	4.569E-03
2.901126E+02	2.00000E+00	6.2394E-09	2.2608E-07	1.0023E-01	2.261E-07	4.274E-03
3.101304E+02	2.00000E+00	5.4221E-09	1.8379E-07	9.7822E-02	1.838E-07	3.998E-03
3.315294E+02	2.00000E+00	4.7179E-09	1.4959E-07	9.5498E-02	1.496E-07	3.740E-03
3.544049E+02	2.00000E+00	4.1103E-09	1.2192E-07	9.3262E-02	1.219E-07	3.498E-03
3.788588E+02	2.00000E+00	3.5857E-09	9.9493E-08	9.1115E-02	9.949E-08	3.273E-03
4.050001E+02	2.00000E+00	3.1323E-09	8.1301E-08	8.9056E-02	8.130E-08	3.061E-03
4.329451E+02	2.00000E+00	2.7399E-09	6.6526E-08	8.7088E-02	6.653E-08	2.864E-03





Li Z = 3

Atomic weight = 6.941000E+00 g/mol, nominal density ρ (g/cm³) = 5.3300E-01 μ_a (barns/atom) = μ (cm²/g) \times 1.15258E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 6.06257E+06

2 edges. Edge energies (keV):

K 5.47500E-02 L I 5.34000E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -9.8613E-04, -6.0000E-04 e/atomNuclear Thomson correction f_{NT} = -7.1131E-04 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
5.233200E-03	9.08733E-01	0.0000E+00	0.0000E+00	2.3914E-07	0.000E+00	2.369E+02
5.313300E-03	8.59283E-01	0.0000E+00	0.0000E+00	2.5404E-07	0.000E+00	2.333E+02
5.334660E-03	8.03599E-01	0.0000E+00	0.0000E+00	2.5813E-07	0.000E+00	2.324E+02
5.366700E-03	8.56971E-01	1.0769E-01	1.2165E+05	2.6435E-07	0.000E+00	2.310E+02
5.446800E-03	9.01968E-01	1.0987E-01	1.2230E+05	2.8041E-07	0.000E+00	2.276E+02
1.069000E-02	1.07660E+00	1.7745E-01	1.0064E+05	4.5172E-06	0.000E+00	1.160E+02
1.142761E-02	1.08752E+00	1.7721E-01	9.4014E+04	6.0216E-06	0.000E+00	1.085E+02
1.221612E-02	1.09737E+00	1.7581E-01	8.7249E+04	8.0395E-06	0.000E+00	1.015E+02
1.305903E-02	1.10595E+00	1.7335E-01	8.0477E+04	1.0745E-05	0.000E+00	9.494E+01
1.396010E-02	1.11307E+00	1.6997E-01	7.3813E+04	1.4370E-05	0.000E+00	8.881E+01
1.492335E-02	1.11854E+00	1.6578E-01	6.7348E+04	1.9218E-05	0.000E+00	8.308E+01
1.595306E-02	1.12215E+00	1.6092E-01	6.1155E+04	2.5689E-05	0.000E+00	7.772E+01
1.705382E-02	1.12376E+00	1.5551E-01	5.5284E+04	3.4304E-05	0.000E+00	7.270E+01
1.823053E-02	1.12305E+00	1.4967E-01	4.9772E+04	4.5738E-05	0.000E+00	6.801E+01
1.948844E-02	1.11980E+00	1.4350E-01	4.4641E+04	6.0859E-05	0.000E+00	6.362E+01
2.083314E-02	1.11370E+00	1.3711E-01	3.9900E+04	8.0780E-05	0.000E+00	5.951E+01
2.227063E-02	1.10441E+00	1.3057E-01	3.5543E+04	1.0691E-04	0.000E+00	5.567E+01
2.380730E-02	1.09140E+00	1.2391E-01	3.1553E+04	1.4104E-04	0.000E+00	5.208E+01
2.545001E-02	1.07404E+00	1.1721E-01	2.7922E+04	1.8539E-04	0.000E+00	4.872E+01
2.720606E-02	1.05151E+00	1.1056E-01	2.4637E+04	2.4275E-04	0.000E+00	4.557E+01
2.908377E-02	1.02773E+00	1.0401E-01	2.1683E+04	3.1654E-04	0.000E+00	4.263E+01
3.109002E-02	9.86239E-01	9.7625E-02	1.9037E+04	4.1096E-04	0.000E+00	3.988E+01
3.323523E-02	9.39944E-01	9.1431E-02	1.6678E+04	5.3113E-04	0.000E+00	3.731E+01
3.552846E-02	8.80803E-01	8.5462E-02	1.4583E+04	6.8323E-04	0.000E+00	3.490E+01
3.797993E-02	8.04138E-01	7.9741E-02	1.2729E+04	8.7463E-04	0.000E+00	3.264E+01
4.060054E-02	7.02294E-01	7.4280E-02	1.1092E+04	1.1141E-03	0.000E+00	3.054E+01
4.340198E-02	5.61559E-01	6.9091E-02	9.6509E+03	1.4121E-03	0.000E+00	2.857E+01
4.639671E-02	3.53730E-01	6.4175E-02	8.3856E+03	1.7806E-03	0.000E+00	2.672E+01
4.959809E-02	4.88984E-03	5.9534E-02	7.2770E+03	2.2337E-03	0.000E+00	2.500E+01
5.365500E-02	-1.19807E+00	5.4412E-02	6.1482E+03	2.8982E-03	0.000E+00	2.311E+01
5.447625E-02	-2.31019E+00	5.3466E-02	5.9501E+03	3.0453E-03	0.000E+00	2.276E+01
5.469525E-02	-3.60723E+00	5.3218E-02	5.8988E+03	3.0852E-03	0.000E+00	2.267E+01
5.502375E-02	-2.31071E+00	2.5879E+00	2.8513E+05	3.1456E-03	2.793E+05	2.253E+01
5.584500E-02	-1.18751E+00	2.5985E+00	2.8210E+05	3.2997E-03	2.765E+05	2.220E+01
5.667876E-02	-7.21050E-01	2.6092E+00	2.7909E+05	3.4605E-03	2.736E+05	2.187E+01
6.058959E-02	2.50867E-01	2.6581E+00	2.6597E+05	4.2733E-03	2.612E+05	2.046E+01
6.477028E-02	8.17156E-01	2.6783E+00	2.5069E+05	5.2493E-03	2.466E+05	1.914E+01
6.923942E-02	1.26129E+00	2.6515E+00	2.3217E+05	6.4142E-03	2.286E+05	1.791E+01
7.401695E-02	1.63438E+00	2.5848E+00	2.1171E+05	7.7962E-03	2.087E+05	1.675E+01
7.912411E-02	1.95333E+00	2.4858E+00	1.9047E+05	9.4262E-03	1.878E+05	1.567E+01
8.458368E-02	2.22569E+00	2.3627E+00	1.6935E+05	1.1337E-02	1.671E+05	1.466E+01
9.041995E-02	2.45620E+00	2.2228E+00	1.4904E+05	1.3564E-02	1.471E+05	1.371E+01
9.665893E-02	2.64887E+00	2.0728E+00	1.3001E+05	1.6144E-02	1.283E+05	1.283E+01
1.033284E-01	2.80757E+00	1.9181E+00	1.1254E+05	1.9115E-02	1.111E+05	1.200E+01
1.104581E-01	2.93608E+00	1.7633E+00	9.6781E+04	2.2515E-02	9.557E+04	1.122E+01
1.180797E-01	3.03823E+00	1.6120E+00	8.2763E+04	2.6385E-02	8.173E+04	1.050E+01
1.262272E-01	3.11772E+00	1.4666E+00	7.0439E+04	3.0762E-02	6.957E+04	9.822E+00
1.349368E-01	3.17802E+00	1.3290E+00	5.9708E+04	3.5683E-02	5.897E+04	9.188E+00
1.442475E-01	3.22227E+00	1.2001E+00	5.0439E+04	4.1184E-02	4.982E+04	8.595E+00
1.542005E-01	3.25329E+00	1.0806E+00	4.2485E+04	4.7295E-02	4.196E+04	8.040E+00
1.648404E-01	3.27358E+00	9.7059E-01	3.5697E+04	5.4045E-02	3.526E+04	7.521E+00
1.762144E-01	3.28517E+00	8.6995E-01	2.9930E+04	6.1454E-02	2.956E+04	7.036E+00

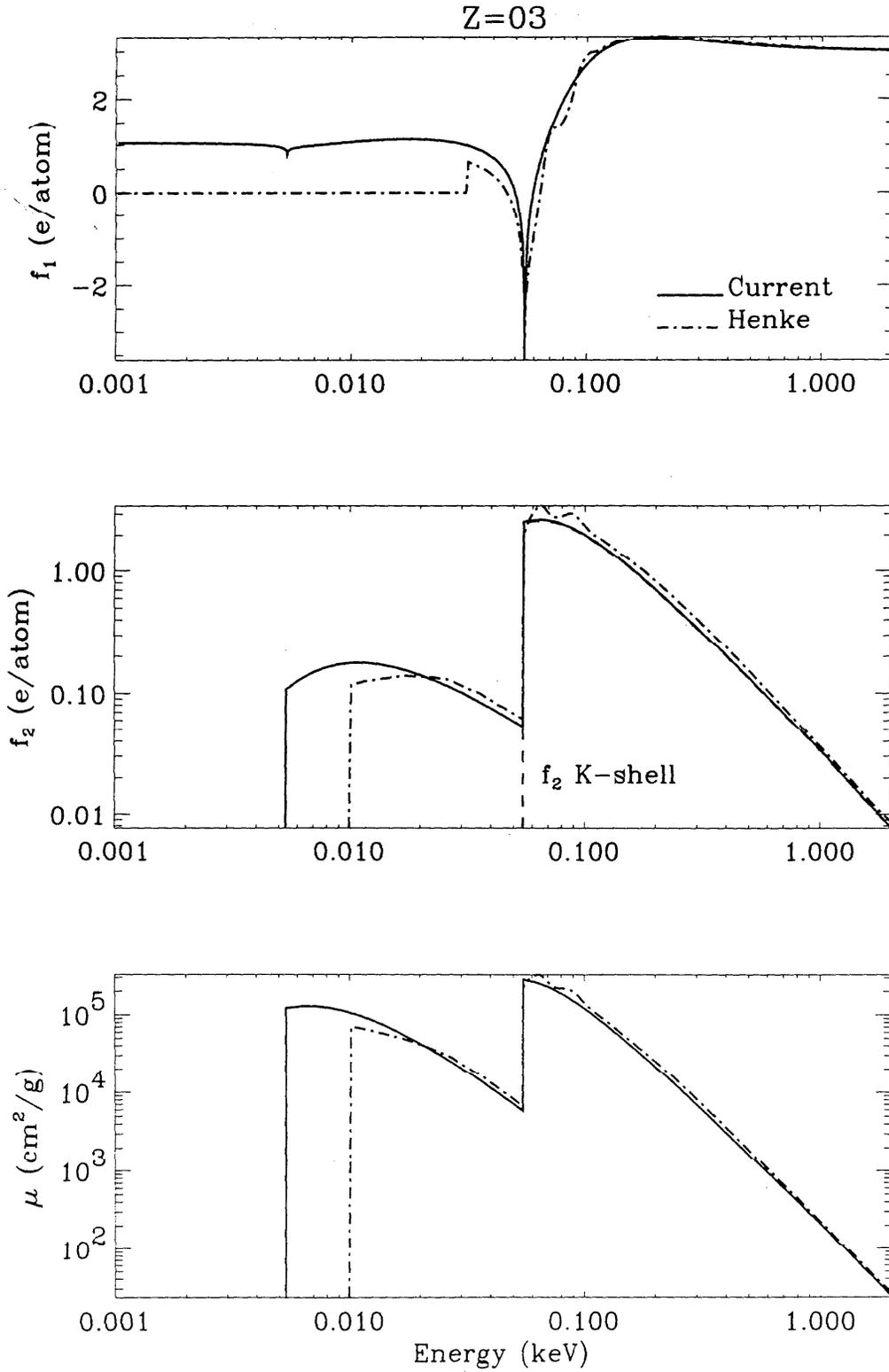
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 95

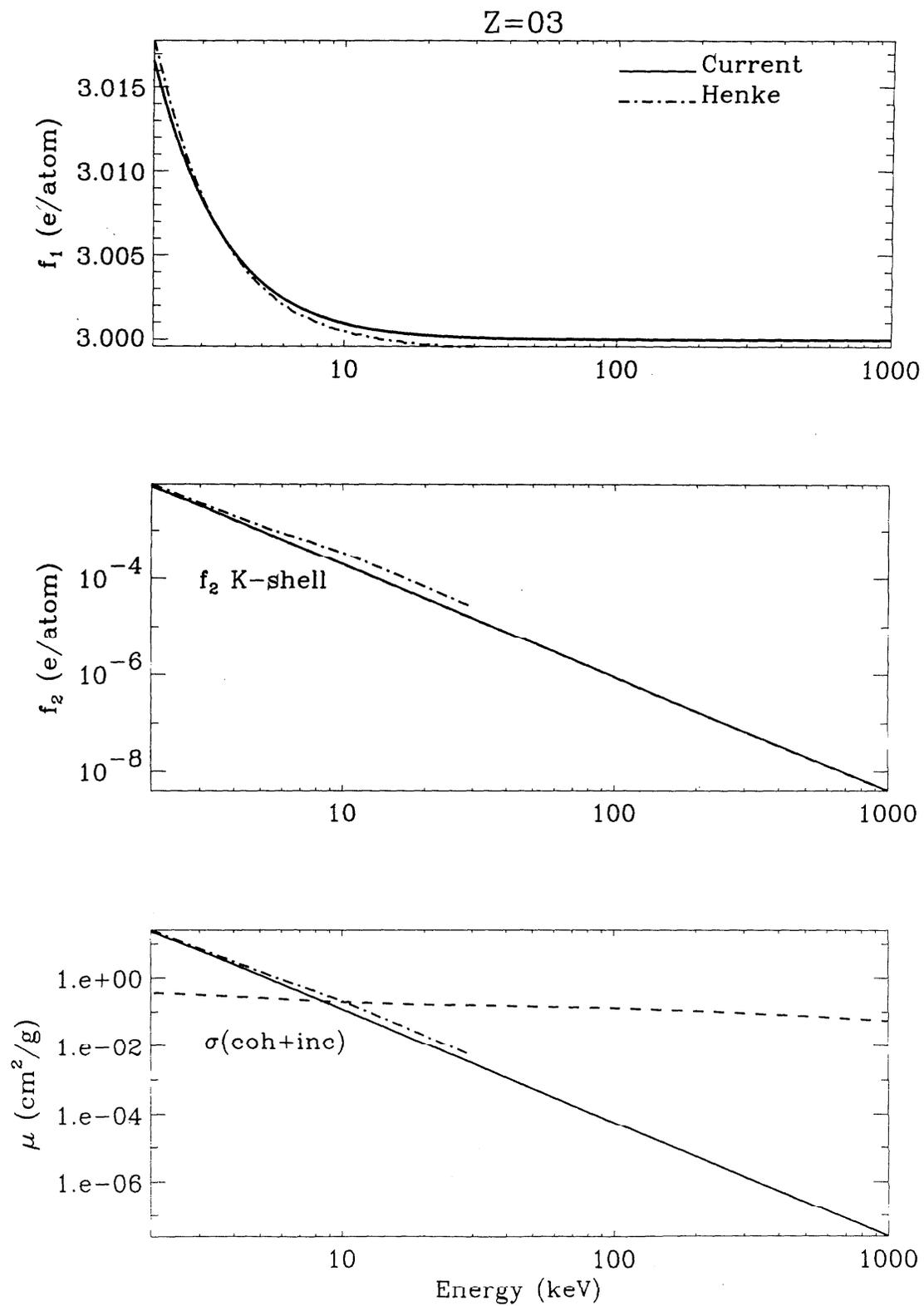
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.883732E-01	3.28990E+00	7.7835E-01	2.3030E+04	6.9539E-02	2.474E+04	6.582E+00
2.013709E-01	3.28929E+00	6.9532E-01	2.0934E+04	7.8307E-02	2.067E+04	6.157E+00
2.152655E-01	3.28462E+00	6.2031E-01	1.7470E+04	8.7760E-02	1.725E+04	5.760E+00
2.301188E-01	3.27691E+00	5.5269E-01	1.4561E+04	9.7889E-02	1.438E+04	5.388E+00
2.459970E-01	3.26695E+00	4.9180E-01	1.2120E+04	1.0867E-01	1.197E+04	5.040E+00
2.629708E-01	3.25537E+00	4.3709E-01	1.0077E+04	1.2009E-01	9.948E+03	4.715E+00
2.811158E-01	3.24269E+00	3.8805E-01	8.3687E+03	1.3209E-01	8.261E+03	4.410E+00
3.005128E-01	3.22935E+00	3.4415E-01	6.9430E+03	1.4463E-01	6.854E+03	4.126E+00
3.212482E-01	3.21568E+00	3.0493E-01	5.7546E+03	1.5765E-01	5.680E+03	3.859E+00
3.434143E-01	3.20197E+00	2.6993E-01	4.7653E+03	1.7108E-01	4.703E+03	3.610E+00
3.671099E-01	3.18842E+00	2.3873E-01	3.9424E+03	1.8484E-01	3.891E+03	3.377E+00
3.924405E-01	3.17518E+00	2.1095E-01	3.2588E+03	1.9884E-01	3.216E+03	3.159E+00
4.195189E-01	3.16239E+00	1.8625E-01	2.6915E+03	2.1298E-01	2.656E+03	2.955E+00
4.484657E-01	3.15011E+00	1.6430E-01	2.2210E+03	2.2717E-01	2.191E+03	2.765E+00
4.794098E-01	3.13842E+00	1.4482E-01	1.8313E+03	2.4128E-01	1.807E+03	2.586E+00
5.124891E-01	3.12734E+00	1.2754E-01	1.5088E+03	2.5522E-01	1.488E+03	2.419E+00
5.478508E-01	3.11690E+00	1.1224E-01	1.2421E+03	2.6887E-01	1.225E+03	2.263E+00
5.856525E-01	3.10711E+00	9.8699E-02	1.0217E+03	2.8212E-01	1.008E+03	2.117E+00
6.260625E-01	3.09796E+00	8.6728E-02	8.3984E+02	2.9486E-01	8.282E+02	1.980E+00
6.692609E-01	3.08945E+00	7.6155E-02	6.8986E+02	3.0698E-01	6.802E+02	1.853E+00
7.154399E-01	3.08155E+00	6.6826E-02	5.6628E+02	3.1838E-01	5.583E+02	1.733E+00
7.648052E-01	3.07424E+00	5.8603E-02	4.6455E+02	3.2897E-01	4.579E+02	1.621E+00
8.175768E-01	3.06751E+00	5.1362E-02	3.8086E+02	3.3866E-01	3.754E+02	1.516E+00
8.739896E-01	3.06132E+00	4.4990E-02	3.1208E+02	3.4739E-01	3.076E+02	1.419E+00
9.342948E-01	3.05566E+00	3.9390E-02	2.5560E+02	3.5509E-01	2.519E+02	1.327E+00
9.987612E-01	3.05049E+00	3.4471E-02	2.0924E+02	3.6171E-01	2.062E+02	1.241E+00
1.067676E+00	3.04576E+00	2.9934E-02	1.6997E+02	3.6721E-01	1.675E+02	1.161E+00
1.141345E+00	3.04136E+00	2.5916E-02	1.3766E+02	3.7158E-01	1.356E+02	1.086E+00
1.220098E+00	3.03729E+00	2.2438E-02	1.1149E+02	3.7480E-01	1.098E+02	1.016E+00
1.304285E+00	3.03355E+00	1.9426E-02	9.0296E+01	3.7687E-01	8.895E+01	9.506E-01
1.394281E+00	3.03015E+00	1.6819E-02	7.3130E+01	3.7782E-01	7.204E+01	8.892E-01
1.490486E+00	3.02705E+00	1.4561E-02	5.9228E+01	3.7767E-01	5.834E+01	8.318E-01
1.593329E+00	3.02425E+00	1.2607E-02	4.7968E+01	3.7646E-01	4.725E+01	7.781E-01
1.703269E+00	3.02172E+00	1.0915E-02	3.8850E+01	3.7425E-01	3.826E+01	7.279E-01
1.820795E+00	3.01943E+00	9.4497E-03	3.1464E+01	3.7109E-01	3.099E+01	6.809E-01
1.946430E+00	3.01738E+00	8.1814E-03	2.5483E+01	3.6706E-01	2.509E+01	6.370E-01
2.080733E+00	3.01553E+00	7.0833E-03	2.0638E+01	3.6223E-01	2.032E+01	5.959E-01
2.224304E+00	3.01387E+00	6.1326E-03	1.6715E+01	3.5668E-01	1.646E+01	5.574E-01
2.377781E+00	3.01238E+00	5.3094E-03	1.3537E+01	3.5050E-01	1.333E+01	5.214E-01
2.541848E+00	3.01105E+00	4.5965E-03	1.0963E+01	3.4376E-01	1.079E+01	4.878E-01
2.717235E+00	3.00986E+00	3.9792E-03	8.8782E+00	3.3657E-01	8.742E+00	4.563E-01
2.904724E+00	3.00881E+00	3.4448E-03	7.1897E+00	3.2900E-01	7.080E+00	4.268E-01
3.105150E+00	3.00786E+00	2.9684E-03	5.7955E+00	3.2114E-01	5.707E+00	3.993E-01
3.319406E+00	3.00699E+00	2.5468E-03	4.6515E+00	3.1308E-01	4.580E+00	3.735E-01
3.548445E+00	3.00621E+00	2.1851E-03	3.7333E+00	3.0489E-01	3.676E+00	3.494E-01
3.793288E+00	3.00552E+00	1.8748E-03	2.9963E+00	2.9665E-01	2.950E+00	3.269E-01
4.055024E+00	3.00490E+00	1.6085E-03	2.4048E+00	2.8842E-01	2.368E+00	3.058E-01
4.334821E+00	3.00435E+00	1.3801E-03	1.9301E+00	2.8028E-01	1.900E+00	2.860E-01
4.633924E+00	3.00385E+00	1.1841E-03	1.5491E+00	2.7227E-01	1.525E+00	2.676E-01
4.953664E+00	3.00341E+00	1.0159E-03	1.2433E+00	2.6445E-01	1.224E+00	2.503E-01
5.295467E+00	3.00302E+00	8.7162E-04	9.9788E-01	2.5685E-01	9.825E-01	2.341E-01
5.660855E+00	3.00268E+00	7.4783E-04	8.0090E-01	2.4952E-01	7.886E-01	2.190E-01
6.051453E+00	3.00237E+00	6.4162E-04	6.4280E-01	2.4249E-01	6.329E-01	2.049E-01
6.469004E+00	3.00210E+00	5.5050E-04	5.1591E-01	2.3578E-01	5.080E-01	1.917E-01
6.915365E+00	3.00186E+00	4.7232E-04	4.1407E-01	2.2941E-01	4.077E-01	1.793E-01
7.392525E+00	3.00164E+00	4.0524E-04	3.3233E-01	2.2339E-01	3.272E-01	1.677E-01
7.902609E+00	3.00145E+00	3.4768E-04	2.6673E-01	2.1772E-01	2.626E-01	1.569E-01
8.447890E+00	3.00128E+00	2.9831E-04	2.1408E-01	2.1241E-01	2.108E-01	1.468E-01
9.030794E+00	3.00113E+00	2.5574E-04	1.7168E-01	2.0745E-01	1.690E-01	1.373E-01
9.653919E+00	3.00100E+00	2.1863E-04	1.3730E-01	2.0284E-01	1.352E-01	1.284E-01
1.032004E+01	3.00088E+00	1.8691E-04	1.0980E-01	1.9857E-01	1.081E-01	1.201E-01
1.103212E+01	3.00078E+00	1.5979E-04	8.7811E-02	1.9461E-01	8.643E-02	1.124E-01
1.179334E+01	3.00069E+00	1.3661E-04	7.0225E-02	1.9097E-01	6.912E-02	1.051E-01
1.260708E+01	3.00061E+00	1.1679E-04	5.6161E-02	1.8761E-01	5.527E-02	9.834E-02
1.347697E+01	3.00053E+00	9.9841E-05	4.4913E-02	1.8453E-01	4.420E-02	9.200E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.440688E+01	3.00047E+00	8.5355E-05	3.5918E-02	1.8169E-01	3.535E-02	8.606E-02
1.540095E+01	3.00042E+00	7.2971E-05	2.8725E-02	1.7908E-01	2.827E-02	8.050E-02
1.646362E+01	3.00037E+00	6.2383E-05	2.2972E-02	1.7668E-01	2.260E-02	7.531E-02
1.759961E+01	3.00032E+00	5.3332E-05	1.8371E-02	1.7445E-01	1.808E-02	7.045E-02
1.881398E+01	3.00028E+00	4.5594E-05	1.4692E-02	1.7240E-01	1.445E-02	6.590E-02
2.011215E+01	3.00025E+00	3.8979E-05	1.1750E-02	1.7048E-01	1.156E-02	6.165E-02
2.149988E+01	3.00022E+00	3.3323E-05	9.3966E-03	1.6868E-01	9.243E-03	5.767E-02
2.298338E+01	3.00019E+00	2.8488E-05	7.5147E-03	1.6698E-01	7.392E-03	5.395E-02
2.456923E+01	3.00017E+00	2.4355E-05	6.0097E-03	1.6537E-01	5.911E-03	5.046E-02
2.626450E+01	3.00015E+00	2.0857E-05	4.8144E-03	1.6382E-01	4.735E-03	4.721E-02
2.807676E+01	3.00013E+00	1.7837E-05	3.8515E-03	1.6232E-01	3.788E-03	4.416E-02
3.001405E+01	3.00012E+00	1.5245E-05	3.0794E-03	1.6086E-01	3.028E-03	4.131E-02
3.208502E+01	3.00010E+00	1.3030E-05	2.4621E-03	1.5941E-01	2.421E-03	3.864E-02
3.429889E+01	3.00009E+00	1.1137E-05	1.9686E-03	1.5797E-01	1.935E-03	3.615E-02
3.666551E+01	3.00008E+00	9.5189E-06	1.5739E-03	1.5653E-01	1.547E-03	3.381E-02
3.919543E+01	3.00007E+00	8.1358E-06	1.2584E-03	1.5507E-01	1.237E-03	3.163E-02
4.189992E+01	3.00006E+00	6.9538E-06	1.0062E-03	1.5360E-01	9.887E-04	2.959E-02
4.479101E+01	3.00005E+00	5.9434E-06	8.0446E-04	1.5209E-01	7.904E-04	2.768E-02
4.788159E+01	3.00005E+00	5.0799E-06	6.4319E-04	1.5055E-01	6.319E-04	2.589E-02
5.118542E+01	3.00004E+00	4.3418E-06	5.1426E-04	1.4897E-01	5.052E-04	2.422E-02
5.471721E+01	3.00004E+00	3.7110E-06	4.1117E-04	1.4734E-01	4.039E-04	2.266E-02
5.849270E+01	3.00003E+00	3.1718E-06	3.2875E-04	1.4566E-01	3.229E-04	2.120E-02
6.252870E+01	3.00003E+00	2.7110E-06	2.6285E-04	1.4394E-01	2.581E-04	1.983E-02
6.684318E+01	3.00002E+00	2.3171E-06	2.1016E-04	1.4216E-01	2.063E-04	1.855E-02
7.145536E+01	3.00002E+00	1.9805E-06	1.6803E-04	1.4033E-01	1.650E-04	1.735E-02
7.638578E+01	3.00002E+00	1.6927E-06	1.3435E-04	1.3845E-01	1.319E-04	1.623E-02
8.165640E+01	3.00002E+00	1.4468E-06	1.0742E-04	1.3652E-01	1.054E-04	1.518E-02
8.729069E+01	3.00001E+00	1.2366E-06	8.5885E-05	1.3454E-01	8.428E-05	1.420E-02
9.331374E+01	3.00001E+00	1.0569E-06	6.8669E-05	1.3251E-01	6.738E-05	1.329E-02
9.975239E+01	3.00001E+00	9.0339E-07	5.4904E-05	1.3043E-01	5.386E-05	1.243E-02
1.066353E+02	3.00001E+00	7.7214E-07	4.3899E-05	1.2832E-01	4.306E-05	1.163E-02
1.139931E+02	3.00001E+00	6.5996E-07	3.5099E-05	1.2616E-01	3.442E-05	1.088E-02
1.218587E+02	3.00001E+00	5.6408E-07	2.8064E-05	1.2396E-01	2.752E-05	1.017E-02
1.302669E+02	3.00001E+00	4.8213E-07	2.2438E-05	1.2173E-01	2.200E-05	9.518E-03
1.392553E+02	3.00001E+00	4.1209E-07	1.7941E-05	1.1947E-01	1.759E-05	8.903E-03
1.488640E+02	3.00001E+00	3.5222E-07	1.4344E-05	1.1718E-01	1.406E-05	8.329E-03
1.591356E+02	3.00000E+00	3.0105E-07	1.1469E-05	1.1487E-01	1.124E-05	7.791E-03
1.701159E+02	3.00000E+00	2.5732E-07	9.1702E-06	1.1254E-01	8.986E-06	7.288E-03
1.818539E+02	3.00000E+00	2.1993E-07	7.3321E-06	1.1019E-01	7.184E-06	6.818E-03
1.944018E+02	3.00000E+00	1.8798E-07	5.8624E-06	1.0783E-01	5.743E-06	6.378E-03
2.078156E+02	3.00000E+00	1.6067E-07	4.6873E-06	1.0547E-01	4.591E-06	5.966E-03
2.221548E+02	3.00000E+00	1.3733E-07	3.7478E-06	1.0310E-01	3.670E-06	5.581E-03
2.374835E+02	3.00000E+00	1.1738E-07	2.9966E-06	1.0073E-01	2.934E-06	5.221E-03
2.538699E+02	3.00000E+00	1.0033E-07	2.3959E-06	9.8358E-02	2.346E-06	4.884E-03
2.713869E+02	3.00000E+00	8.5755E-08	1.9157E-06	9.5996E-02	1.875E-06	4.569E-03
2.901126E+02	3.00000E+00	7.3297E-08	1.5317E-06	9.3644E-02	1.499E-06	4.274E-03
3.101304E+02	3.00000E+00	6.2649E-08	1.2247E-06	9.1304E-02	1.198E-06	3.998E-03
3.315294E+02	3.00000E+00	5.3548E-08	9.7922E-07	8.8979E-02	9.581E-07	3.740E-03
3.544049E+02	3.00000E+00	4.5770E-08	7.8295E-07	8.6673E-02	7.660E-07	3.498E-03
3.788588E+02	3.00000E+00	3.9121E-08	6.2602E-07	8.4389E-02	6.123E-07	3.273E-03
4.050001E+02	3.00000E+00	3.3438E-08	5.0054E-07	8.2127E-02	4.895E-07	3.061E-03
4.329451E+02	3.00000E+00	2.8581E-08	4.0022E-07	7.9892E-02	3.913E-07	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 99

Be Z = 4

Atomic weight = 9.012180E+00 g/mol, nominal density ρ (g/cm³) = 1.8450E+00

μ_{κ} (barns/atom) = μ (cm²/g) \times 1.49651E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.66927E+06

λ edges. Edge energies (keV):

K 1.11000E-01 L I 8.42000E-03
 Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.7882E-03, -6.0000E-04 e/atom
 Nuclear Thomson correction f_{NT} = -9.7394E-04 e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{κ} cm ² /g	λ nm
8.251600E-03	1.55864E+00	0.0000E+00	0.0000E+00	3.7164E-05	0.000E+00	1.503E+02
8.377900E-03	1.50947E+00	0.0000E+00	0.0000E+00	3.9696E-05	0.000E+00	1.480E+02
8.411580E-03	1.45794E+00	0.0000E+00	0.0000E+00	4.0392E-05	0.000E+00	1.474E+02
8.462100E-03	1.50266E+00	9.7318E-02	5.3699E+04	4.1457E-05	0.000E+00	1.465E+02
8.588400E-03	1.53756E+00	1.0286E-01	5.5921E+04	4.4188E-05	0.000E+00	1.444E+02
1.069000E-02	1.58480E+00	2.1247E-01	9.2803E+04	1.1073E-04	0.000E+00	1.160E+02
1.142761E-02	1.60258E+00	2.4694E-01	1.0090E+05	1.4508E-04	0.000E+00	1.085E+02
1.221612E-02	1.62546E+00	2.7870E-01	1.0653E+05	1.8921E-04	0.000E+00	1.015E+02
1.305903E-02	1.65269E+00	3.0660E-01	1.0962E+05	2.4559E-04	0.000E+00	9.494E+01
1.396010E-02	1.68318E+00	3.2988E-01	1.1034E+05	3.1727E-04	0.000E+00	8.881E+01
1.492335E-02	1.71575E+00	3.4820E-01	1.0895E+05	4.0794E-04	0.000E+00	8.308E+01
1.595306E-02	1.74924E+00	3.6151E-01	1.0581E+05	5.2203E-04	0.000E+00	7.772E+01
1.705382E-02	1.78263E+00	3.7006E-01	1.0132E+05	6.6485E-04	0.000E+00	7.270E+01
1.823053E-02	1.81506E+00	3.7426E-01	9.5856E+04	8.4272E-04	0.000E+00	6.801E+01
1.948844E-02	1.84585E+00	3.7463E-01	8.9757E+04	1.0631E-03	0.000E+00	6.362E+01
2.083314E-02	1.87451E+00	3.7173E-01	8.3316E+04	1.3348E-03	0.000E+00	5.951E+01
2.227063E-02	1.90068E+00	3.6615E-01	7.6767E+04	1.6680E-03	0.000E+00	5.567E+01
2.380730E-02	1.92412E+00	3.5841E-01	7.0294E+04	2.0745E-03	0.000E+00	5.208E+01
2.545001E-02	1.94468E+00	3.4900E-01	6.4030E+04	2.5680E-03	0.000E+00	4.872E+01
2.720606E-02	1.96230E+00	3.3833E-01	5.8066E+04	3.1640E-03	0.000E+00	4.557E+01
2.908327E-02	1.97692E+00	3.2677E-01	5.2462E+04	3.8801E-03	0.000E+00	4.263E+01
3.109002E-02	1.98850E+00	3.1461E-01	4.7249E+04	4.7363E-03	0.000E+00	3.988E+01
3.323523E-02	1.99700E+00	3.0208E-01	4.2439E+04	5.7547E-03	0.000E+00	3.731E+01
3.552846E-02	2.00234E+00	2.8933E-01	3.8024E+04	6.9600E-03	0.000E+00	3.490E+01
3.797993E-02	2.00432E+00	2.7642E-01	3.3983E+04	8.3792E-03	0.000E+00	3.264E+01
4.060054E-02	2.00267E+00	2.6351E-01	3.0305E+04	1.0042E-02	0.000E+00	3.054E+01
4.340198E-02	1.99706E+00	2.5070E-01	2.6970E+04	1.1981E-02	0.000E+00	2.857E+01
4.639671E-02	1.98704E+00	2.3807E-01	2.3959E+04	1.4229E-02	0.000E+00	2.672E+01
4.959809E-02	1.97202E+00	2.2569E-01	2.1247E+04	1.6824E-02	0.000E+00	2.500E+01
5.302035E-02	1.95120E+00	2.1360E-01	1.8811E+04	1.9805E-02	0.000E+00	2.338E+01
5.667876E-02	1.92346E+00	2.0184E-01	1.6628E+04	2.3211E-02	0.000E+00	2.187E+01
6.058959E-02	1.88729E+00	1.9044E-01	1.4676E+04	2.7084E-02	0.000E+00	2.046E+01
6.477028E-02	1.84054E+00	1.7941E-01	1.2933E+04	3.1465E-02	0.000E+00	1.914E+01
6.923942E-02	1.78009E+00	1.6876E-01	1.1381E+04	3.6398E-02	0.000E+00	1.791E+01
7.401695E-02	1.70124E+00	1.5851E-01	9.9991E+03	4.1925E-02	0.000E+00	1.675E+01
7.912411E-02	1.59647E+00	1.4865E-01	8.7723E+03	4.8085E-02	0.000E+00	1.567E+01
8.458368E-02	1.45290E+00	1.3921E-01	7.6847E+03	5.4919E-02	0.000E+00	1.466E+01
9.041995E-02	1.24579E+00	1.3017E-01	6.7220E+03	6.2460E-02	0.000E+00	1.371E+01
9.665893E-02	9.18719E-01	1.2155E-01	5.8715E+03	7.0743E-02	0.000E+00	1.283E+01
1.033284E-01	2.91953E-01	1.1333E-01	5.1214E+03	7.9795E-02	0.000E+00	1.200E+01
1.087800E-01	-1.10059E+00	1.0728E-01	4.6051E+03	8.7308E-02	0.000E+00	1.140E+01
1.104581E-01	-2.81138E+00	1.0553E-01	4.4610E+03	8.9636E-02	0.000E+00	1.122E+01
1.108890E-01	-4.79732E+00	1.0509E-01	4.4250E+03	9.0236E-02	0.000E+00	1.118E+01
1.115550E-01	-2.70425E+00	4.0732E+00	1.7049E+05	9.1162E-02	1.661E+05	1.111E+01
1.132200E-01	-8.67705E-01	4.0070E+00	1.6525E+05	9.3483E-02	1.610E+05	1.095E+01
1.180797E-01	7.43908E-01	3.8249E+00	1.5125E+05	1.0028E-01	1.474E+05	1.050E+01
1.262272E-01	1.85031E+00	3.5508E+00	1.3135E+05	1.1175E-01	1.280E+05	9.822E+00
1.349368E-01	2.50334E+00	3.2850E+00	1.1367E+05	1.2402E-01	1.107E+05	9.188E+00
1.442475E-01	2.95829E+00	3.0279E+00	9.8012E+04	1.3710E-01	9.548E+04	8.595E+00
1.542005E-01	3.29619E+00	2.7813E+00	8.4219E+04	1.5097E-01	8.202E+04	8.040E+00
1.648404E-01	3.55465E+00	2.5461E+00	7.2122E+04	1.6560E-01	7.024E+04	7.521E+00
1.762144E-01	3.75464E+00	2.3237E+00	6.1572E+04	1.8094E-01	5.997E+04	7.036E+00
1.883732E-01	3.90990E+00	2.1149E+00	5.2422E+04	1.9695E-01	5.106E+04	6.582E+00
2.013709E-01	4.03003E+00	1.9199E+00	4.4519E+04	2.1357E-01	4.336E+04	6.157E+00

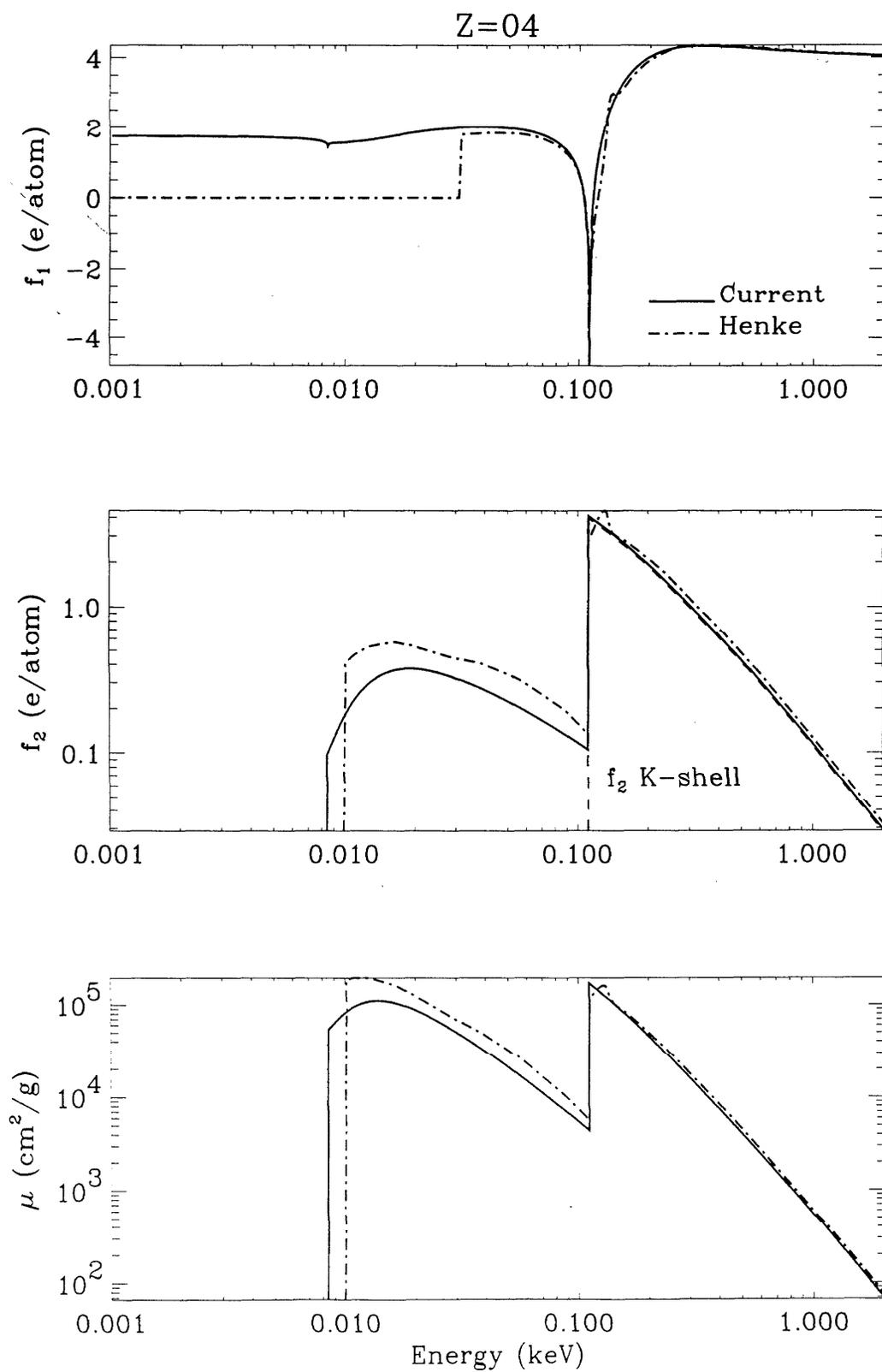
TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

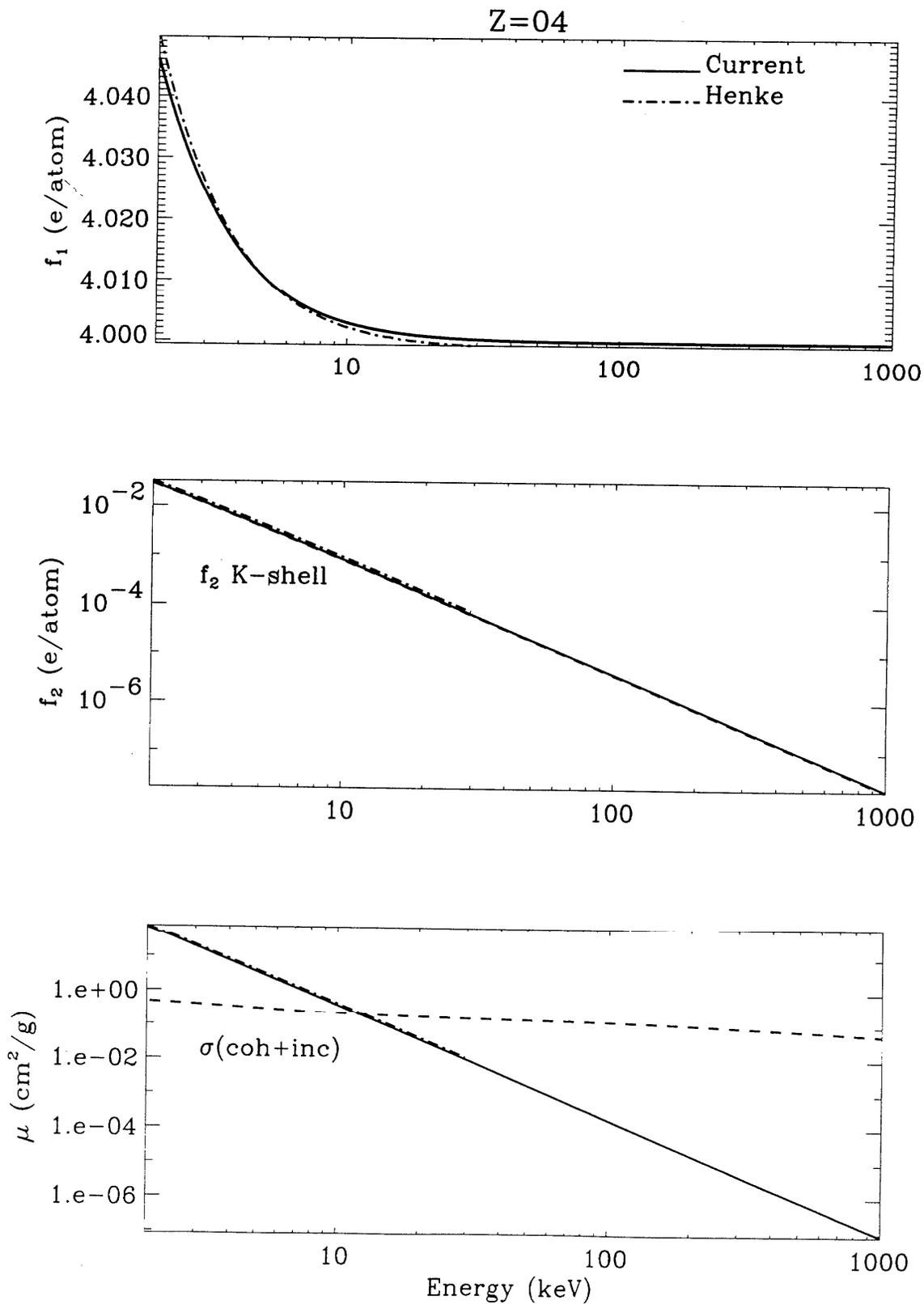
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.152655E-01	4.12212E+00	1.7389E+00	3.7718E+04	2.3073E-01	3.674E+04	5.760E+00
2.301188E-01	4.19162E+00	1.5715E+00	3.1887E+04	2.4834E-01	3.106E+04	5.388E+00
2.439970E-01	4.24285E+00	1.4173E+00	2.6902E+04	2.6631E-01	2.621E+04	5.040E+00
2.629708E-01	4.27928E+00	1.2758E+00	2.2654E+04	2.8456E-01	2.207E+04	4.715E+00
2.811158E-01	4.30376E+00	1.1464E+00	1.9042E+04	3.0296E-01	1.855E+04	4.410E+00
3.005128E-01	4.31861E+00	1.0285E+00	1.5980E+04	3.2140E-01	1.556E+04	4.126E+00
3.212482E-01	4.32576E+00	9.2117E-01	1.3389E+04	3.3977E-01	1.304E+04	3.859E+00
3.434143E-01	4.32684E+00	8.2386E-01	1.1202E+04	3.5794E-01	1.091E+04	3.610E+00
3.671099E-01	4.32314E+00	7.3579E-01	9.3585E+03	3.7578E-01	9.113E+03	3.377E+00
3.924405E-01	4.31578E+00	6.5626E-01	7.8082E+03	3.9318E-01	7.603E+03	3.159E+00
4.195189E-01	4.30567E+00	5.8459E-01	6.5065E+03	4.1000E-01	6.335E+03	2.955E+00
4.484657E-01	4.29356E+00	5.2011E-01	5.4152E+03	4.2612E-01	5.272E+03	2.765E+00
4.794098E-01	4.28005E+00	4.6212E-01	4.5008E+03	4.4144E-01	4.381E+03	2.586E+00
5.124891E-01	4.26557E+00	4.1004E-01	3.7359E+03	4.5582E-01	3.636E+03	2.419E+00
5.478508E-01	4.25050E+00	3.6339E-01	3.0971E+03	4.6918E-01	3.014E+03	2.263E+00
5.856525E-01	4.23517E+00	3.2168E-01	2.5647E+03	4.8142E-01	2.495E+03	2.117E+00
6.260625E-01	4.21985E+00	2.8447E-01	2.1216E+03	4.9245E-01	2.064E+03	1.980E+00
6.692609E-01	4.20476E+00	2.5134E-01	1.7535E+03	5.0221E-01	1.705E+03	1.853E+00
7.154399E-01	4.19008E+00	2.2187E-01	1.4481E+03	5.1062E-01	1.408E+03	1.733E+00
7.648052E-01	4.17592E+00	1.9572E-01	1.1949E+03	5.1766E-01	1.162E+03	1.621E+00
8.175768E-01	4.16240E+00	1.7254E-01	9.8537E+02	5.2328E-01	9.577E+02	1.516E+00
8.739896E-01	4.14957E+00	1.5201E-01	8.1210E+02	5.2746E-01	7.891E+02	1.419E+00
9.342948E-01	4.13749E+00	1.3385E-01	6.6896E+02	5.3020E-01	6.498E+02	1.327E+00
9.987612E-01	4.12618E+00	1.1782E-01	5.5081E+02	5.3152E-01	5.349E+02	1.241E+00
1.067676E+00	4.11586E+00	1.0297E-01	4.5031E+02	5.3143E-01	4.373E+02	1.161E+00
1.141345E+00	4.10588E+00	8.9977E-02	3.6810E+02	5.2997E-01	3.575E+02	1.086E+00
1.220098E+00	4.09645E+00	7.8625E-02	3.0090E+02	5.2718E-01	2.922E+02	1.016E+00
1.304285E+00	4.08767E+00	6.8705E-02	2.4596E+02	5.2313E-01	2.388E+02	9.506E-01
1.394281E+00	4.07955E+00	6.0037E-02	2.0106E+02	5.1788E-01	1.952E+02	8.892E-01
1.490486E+00	4.07207E+00	5.2463E-02	1.6435E+02	5.1152E-01	1.596E+02	8.318E-01
1.593329E+00	4.06521E+00	4.5844E-02	1.3435E+02	5.0412E-01	1.305E+02	7.781E-01
1.703269E+00	4.05894E+00	4.0060E-02	1.0982E+02	4.9577E-01	1.066E+02	7.279E-01
1.820795E+00	4.05324E+00	3.5006E-02	8.9769E+01	4.8658E-01	8.717E+01	6.809E-01
1.946430E+00	4.04805E+00	3.0589E-02	7.3380E+01	4.7664E-01	7.125E+01	6.370E-01
2.080733E+00	4.04336E+00	2.6730E-02	5.9983E+01	4.6604E-01	5.824E+01	5.959E-01
2.224304E+00	4.03909E+00	2.3204E-02	4.8710E+01	4.5491E-01	4.729E+01	5.574E-01
2.377781E+00	4.03518E+00	2.0139E-02	3.9548E+01	4.4332E-01	3.838E+01	5.214E-01
2.541848E+00	4.03162E+00	1.7480E-02	3.2110E+01	4.3139E-01	3.116E+01	4.878E-01
2.717235E+00	4.02839E+00	1.5171E-02	2.6070E+01	4.1920E-01	2.529E+01	4.563E-01
2.904724E+00	4.02551E+00	1.3168E-02	2.1167E+01	4.0686E-01	2.053E+01	4.268E-01
3.105150E+00	4.02306E+00	1.1388E-02	1.7124E+01	3.9444E-01	1.661E+01	3.993E-01
3.319406E+00	4.02063E+00	9.8151E-03	1.3806E+01	3.8204E-01	1.339E+01	3.735E-01
3.548445E+00	4.01844E+00	8.4596E-03	1.1132E+01	3.6973E-01	1.079E+01	3.494E-01
3.793288E+00	4.01646E+00	7.2914E-03	8.9752E+00	3.5757E-01	8.699E+00	3.269E-01
4.055024E+00	4.01468E+00	6.2835E-03	7.2353E+00	3.4563E-01	7.012E+00	3.058E-01
4.334821E+00	4.01308E+00	5.4148E-03	5.8325E+00	3.3397E-01	5.653E+00	2.860E-01
4.633924E+00	4.01165E+00	4.6662E-03	4.7018E+00	3.2264E-01	4.557E+00	2.676E-01
4.953664E+00	4.01037E+00	4.0211E-03	3.7902E+00	3.1167E-01	3.673E+00	2.503E-01
5.295467E+00	4.00923E+00	3.4651E-03	3.0554E+00	3.0111E-01	2.961E+00	2.341E-01
5.660855E+00	4.00820E+00	2.9861E-03	2.4630E+00	2.9098E-01	2.387E+00	2.190E-01
6.051453E+00	4.00729E+00	2.5732E-03	1.9855E+00	2.8130E-01	1.924E+00	2.049E-01
6.469004E+00	4.00647E+00	2.2175E-03	1.6006E+00	2.7209E-01	1.551E+00	1.917E-01
6.915365E+00	4.00574E+00	1.9109E-03	1.2903E+00	2.6336E-01	1.250E+00	1.793E-01
7.392525E+00	4.00510E+00	1.6467E-03	1.0401E+00	2.5511E-01	1.008E+00	1.677E-01
7.902609E+00	4.00452E+00	1.4191E-03	8.3845E-01	2.4735E-01	8.126E-01	1.569E-01
8.447890E+00	4.00401E+00	1.2229E-03	6.7590E-01	2.4006E-01	6.550E-01	1.468E-01
9.030794E+00	4.00356E+00	1.0525E-03	5.4417E-01	2.3323E-01	5.274E-01	1.373E-01
9.653919E+00	4.00316E+00	9.0177E-04	4.3616E-01	2.2687E-01	4.226E-01	1.284E-01
1.032004E+01	4.00280E+00	7.7264E-04	3.4958E-01	2.2094E-01	3.387E-01	1.201E-01
1.103212E+01	4.00248E+00	6.6200E-04	2.8019E-01	2.1543E-01	2.714E-01	1.124E-01
1.179334E+01	4.00219E+00	5.6721E-04	2.2457E-01	2.1032E-01	2.175E-01	1.051E-01
1.260708E+01	4.00194E+00	4.8599E-04	1.8000E-01	2.0559E-01	1.743E-01	9.834E-02
1.347697E+01	4.00171E+00	4.1640E-04	1.4427E-01	2.0122E-01	1.397E-01	9.200E-02
1.440688E+01	4.00151E+00	3.5677E-04	1.1563E-01	1.9717E-01	1.120E-01	8.606E-02
1.540095E+01	4.00134E+00	3.0569E-04	9.2679E-02	1.9343E-01	8.973E-02	8.050E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 101

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.646362E+01	4.00118E+00	2.6192E-04	7.4282E-02	1.8997E-01	7.191E-02	7.531E-02
1.759961E+01	4.00104E+00	2.2441E-04	5.9538E-02	1.8677E-01	5.763E-02	7.045E-02
1.881398E+01	4.00092E+00	1.9228E-04	4.7720E-02	1.8379E-01	4.619E-02	6.590E-02
2.011215E+01	4.00081E+00	1.6475E-04	3.8248E-02	1.8102E-01	3.701E-02	6.165E-02
2.149988E+01	4.00072E+00	1.4116E-04	3.0656E-02	1.7844E-01	2.966E-02	5.767E-02
2.298338E+01	4.00063E+00	1.2094E-04	2.4571E-02	1.7602E-01	2.377E-02	5.395E-02
2.456923E+01	4.00056E+00	1.0363E-04	1.9694E-02	1.7373E-01	1.905E-02	5.046E-02
2.626450E+01	4.00049E+00	8.8788E-05	1.5785E-02	1.7157E-01	1.527E-02	4.721E-02
2.807676E+01	4.00043E+00	7.5940E-05	1.2629E-02	1.6951E-01	1.221E-02	4.416E-02
3.001405E+01	4.00038E+00	6.4915E-05	1.0099E-02	1.6752E-01	9.764E-03	4.131E-02
3.208502E+01	4.00034E+00	5.5490E-05	8.0753E-03	1.6561E-01	7.806E-03	3.864E-02
3.429889E+01	4.00030E+00	4.7433E-05	6.4573E-03	1.6374E-01	6.240E-03	3.615E-02
3.666551E+01	4.00026E+00	4.0546E-05	5.1635E-03	1.6192E-01	4.989E-03	3.381E-02
3.919543E+01	4.00023E+00	3.4660E-05	4.1289E-03	1.6011E-01	3.988E-03	3.163E-02
4.189992E+01	4.00020E+00	2.9628E-05	3.3017E-03	1.5833E-01	3.188E-03	2.959E-02
4.479101E+01	4.00018E+00	2.5326E-05	2.6401E-03	1.5654E-01	2.549E-03	2.768E-02
4.788159E+01	4.00016E+00	2.1649E-05	2.1112E-03	1.5475E-01	2.038E-03	2.589E-02
5.118542E+01	4.00014E+00	1.8512E-05	1.6887E-03	1.5295E-01	1.629E-03	2.422E-02
5.471721E+01	4.00012E+00	1.5845E-05	1.3522E-03	1.5113E-01	1.304E-03	2.266E-02
5.849270E+01	4.00011E+00	1.3563E-05	1.0827E-03	1.4928E-01	1.044E-03	2.120E-02
6.252870E+01	4.00009E+00	1.1610E-05	8.6693E-04	1.4741E-01	8.360E-04	1.983E-02
6.684318E+01	4.00008E+00	9.9374E-06	6.9417E-04	1.4550E-01	6.692E-04	1.855E-02
7.145536E+01	4.00007E+00	8.5061E-06	5.5584E-04	1.4357E-01	5.358E-04	1.735E-02
7.638578E+01	4.00006E+00	7.2810E-06	4.4507E-04	1.4159E-01	4.289E-04	1.623E-02
8.165640E+01	4.00006E+00	6.2323E-06	3.5638E-04	1.3958E-01	3.434E-04	1.518E-02
8.729069E+01	4.00005E+00	5.3347E-06	2.8536E-04	1.3753E-01	2.749E-04	1.420E-02
9.331374E+01	4.00004E+00	4.5664E-06	2.2849E-04	1.3544E-01	2.201E-04	1.329E-02
9.975239E+01	4.00004E+00	3.9087E-06	1.8296E-04	1.3332E-01	1.762E-04	1.243E-02
1.066353E+02	4.00003E+00	3.3457E-06	1.4650E-04	1.3116E-01	1.410E-04	1.163E-02
1.139931E+02	4.00003E+00	2.8639E-06	1.1731E-04	1.2896E-01	1.129E-04	1.088E-02
1.218587E+02	4.00003E+00	2.4514E-06	9.3931E-05	1.2674E-01	9.038E-05	1.017E-02
1.302669E+02	4.00002E+00	2.0984E-06	7.5214E-05	1.2448E-01	7.235E-05	9.518E-03
1.392553E+02	4.00002E+00	1.7962E-06	6.0226E-05	1.2220E-01	5.792E-05	8.903E-03
1.488640E+02	4.00002E+00	1.5375E-06	4.8225E-05	1.1989E-01	4.637E-05	8.329E-03
1.591356E+02	4.00002E+00	1.3161E-06	3.8615E-05	1.1756E-01	3.712E-05	7.791E-03
1.701159E+02	4.00001E+00	1.1265E-06	3.0920E-05	1.1522E-01	2.972E-05	7.288E-03
1.818539E+02	4.00001E+00	9.6428E-07	2.4759E-05	1.1286E-01	2.379E-05	6.818E-03
1.944018E+02	4.00001E+00	8.2541E-07	1.9825E-05	1.1048E-01	1.905E-05	6.378E-03
2.078156E+02	4.00001E+00	7.0654E-07	1.5875E-05	1.0810E-01	1.525E-05	5.966E-03
2.221548E+02	4.00001E+00	6.0479E-07	1.2712E-05	1.0571E-01	1.221E-05	5.581E-03
2.374835E+02	4.00001E+00	5.1770E-07	1.0179E-05	1.0332E-01	9.771E-06	5.221E-03
2.538699E+02	4.00001E+00	4.4314E-07	8.1504E-06	1.0093E-01	7.823E-06	4.884E-03
2.713869E+02	4.00001E+00	3.7933E-07	6.5264E-06	9.8543E-02	6.262E-06	4.569E-03
2.901126E+02	4.00000E+00	3.2470E-07	5.2259E-06	9.6164E-02	5.013E-06	4.274E-03
3.101304E+02	4.00000E+00	2.7794E-07	4.1846E-06	9.3795E-02	4.013E-06	3.998E-03
3.315294E+02	4.00000E+00	2.3792E-07	3.3508E-06	9.1439E-02	3.213E-06	3.740E-03
3.544049E+02	4.00000E+00	2.0366E-07	2.6832E-06	8.9098E-02	2.572E-06	3.498E-03
3.788588E+02	4.00000E+00	1.7433E-07	2.1485E-06	8.6776E-02	2.059E-06	3.273E-03
4.050001E+02	4.00000E+00	1.4923E-07	1.7704E-06	8.4474E-02	1.648E-06	3.061E-03
4.329451E+02	4.00000E+00	1.2774E-07	1.3776E-06	8.2195E-02	1.320E-06	2.864E-03





B Z = 5Atomic weight = 1.081000E+01 g/mol, nominal density ρ (g/cm³) = 2.3400E+00 μ_a (barns/atom) = μ (cm²/g) \times 1.79504E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.89272E+06

3 edges. Edge energies (keV):

K 1.88000E-01 L I 1.34700E-02 L II 4.70000E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.8487E-03, -1.2000E-03 e/atomNuclear Thomson correction f_{NT} = -1.2687E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
4.606000E-03	8.03768E-01	0.0000E+00	0.0000E+00	6.1552E-05	0.000E+00	2.692E+02
4.676500E-03	3.03582E-01	0.0000E+00	0.0000E+00	6.5531E-05	0.000E+00	2.651E+02
4.695300E-03	-2.92582E-01	0.0000E+00	0.0000E+00	6.6621E-05	0.000E+00	2.641E+02
4.723500E-03	3.23173E-01	1.1721E+00	9.6591E+05	6.8281E-05	0.000E+00	2.625E+02
4.794000E-03	8.61328E-01	1.1548E+00	9.3769E+05	7.2554E-05	0.000E+00	2.586E+02
1.069000E-02	2.36087E+00	6.3908E-01	2.3272E+05	1.3920E-03	0.000E+00	1.160E+02
1.142761E-02	2.37363E+00	6.0622E-01	2.0650E+05	1.7295E-03	0.000E+00	1.085E+02
1.221612E-02	2.37133E+00	5.7327E-01	1.8267E+05	2.1398E-03	0.000E+00	1.015E+02
1.305903E-02	2.33137E+00	5.4038E-01	1.6108E+05	2.6362E-03	0.000E+00	9.494E+01
1.320060E-02	2.31282E+00	5.3508E-01	1.5779E+05	2.7255E-03	0.000E+00	9.392E+01
1.340265E-02	2.25109E+00	5.2763E-01	1.5325E+05	2.8559E-03	0.000E+00	9.251E+01
1.345653E-02	2.18102E+00	5.2567E-01	1.5207E+05	2.8913E-03	0.000E+00	9.214E+01
1.353735E-02	2.24636E+00	6.5844E-01	1.8934E+05	2.9448E-03	0.000E+00	9.159E+01
1.373940E-02	2.30171E+00	6.5819E-01	1.8648E+05	3.0811E-03	0.000E+00	9.024E+01
1.396010E-02	2.32499E+00	6.5834E-01	1.8358E+05	3.2340E-03	0.000E+00	8.881E+01
1.492335E-02	2.36971E+00	6.6435E-01	1.7329E+05	3.9507E-03	0.000E+00	8.308E+01
1.595306E-02	2.40102E+00	6.7606E-01	1.6497E+05	4.8061E-03	0.000E+00	7.772E+01
1.705382E-02	2.43266E+00	6.8985E-01	1.5746E+05	5.8225E-03	0.000E+00	7.270E+01
1.823053E-02	2.46722E+00	7.0420E-01	1.5037E+05	7.0249E-03	0.000E+00	6.801E+01
1.948844E-02	2.50542E+00	7.1767E-01	1.4335E+05	8.4409E-03	0.000E+00	6.362E+01
2.083314E-02	2.54708E+00	7.2892E-01	1.3620E+05	1.0101E-02	0.000E+00	5.951E+01
2.227063E-02	2.59154E+00	7.3700E-01	1.2882E+05	1.2039E-02	0.000E+00	5.567E+01
2.380730E-02	2.63793E+00	7.4132E-01	1.2121E+05	1.4291E-02	0.000E+00	5.208E+01
2.545001E-02	2.68534E+00	7.4153E-01	1.1342E+05	1.6897E-02	0.000E+00	4.872E+01
2.720606E-02	2.73282E+00	7.3754E-01	1.0553E+05	1.9899E-02	0.000E+00	4.557E+01
2.908327E-02	2.77952E+00	7.2948E-01	9.7639E+04	2.3342E-02	0.000E+00	4.263E+01
3.109002E-02	2.82470E+00	7.1764E-01	8.9854E+04	2.7273E-02	0.000E+00	3.988E+01
3.323523E-02	2.86772E+00	7.0241E-01	8.2270E+04	3.1743E-02	0.000E+00	3.731E+01
3.552846E-02	2.90809E+00	6.8424E-01	7.4970E+04	3.6803E-02	0.000E+00	3.490E+01
3.797993E-02	2.94544E+00	6.6364E-01	6.8019E+04	4.2507E-02	0.000E+00	3.264E+01
4.060054E-02	2.97932E+00	6.4107E-01	6.1464E+04	4.8907E-02	0.000E+00	3.054E+01
4.340198E-02	3.00989E+00	6.1699E-01	5.5338E+04	5.6058E-02	0.000E+00	2.857E+01
4.639671E-02	3.03686E+00	5.9184E-01	4.9655E+04	6.4014E-02	0.000E+00	2.672E+01
4.959809E-02	3.06015E+00	5.6597E-01	4.4421E+04	7.2827E-02	0.000E+00	2.500E+01
5.302035E-02	3.07973E+00	5.3974E-01	3.9627E+04	8.2546E-02	0.000E+00	2.338E+01
5.667876E-02	3.09557E+00	5.1332E-01	3.5255E+04	9.3218E-02	0.000E+00	2.187E+01
6.058959E-02	3.10748E+00	4.8680E-01	3.1276E+04	1.0489E-01	0.000E+00	2.046E+01
6.477028E-02	3.11523E+00	4.6045E-01	2.7673E+04	1.1759E-01	0.000E+00	1.914E+01
6.923942E-02	3.11858E+00	4.3449E-01	2.4428E+04	1.3135E-01	0.000E+00	1.791E+01
7.401695E-02	3.11726E+00	4.0910E-01	2.1515E+04	1.4620E-01	0.000E+00	1.675E+01
7.912411E-02	3.11091E+00	3.8440E-01	1.8912E+04	1.6216E-01	0.000E+00	1.567E+01
8.458368E-02	3.09899E+00	3.6052E-01	1.6592E+04	1.7922E-01	0.000E+00	1.466E+01
9.041995E-02	3.08080E+00	3.3727E-01	1.4520E+04	1.9739E-01	0.000E+00	1.371E+01
9.665893E-02	3.05508E+00	3.1461E-01	1.2670E+04	2.1664E-01	0.000E+00	1.283E+01
1.033284E-01	3.02038E+00	2.9304E-01	1.1040E+04	2.3696E-01	0.000E+00	1.200E+01
1.104581E-01	2.97471E+00	2.7258E-01	9.6060E+03	2.5830E-01	0.000E+00	1.122E+01
1.180797E-01	2.91504E+00	2.5321E-01	8.3475E+03	2.8061E-01	0.000E+00	1.050E+01
1.262272E-01	2.83673E+00	2.3492E-01	7.2448E+03	3.0382E-01	0.000E+00	9.822E+00
1.349368E-01	2.73225E+00	2.1770E-01	6.2804E+03	3.2785E-01	0.000E+00	9.188E+00
1.442475E-01	2.58847E+00	2.0152E-01	5.4383E+03	3.5262E-01	0.000E+00	8.595E+00
1.542005E-01	2.37982E+00	1.8634E-01	4.7041E+03	3.7801E-01	0.000E+00	8.040E+00
1.648404E-01	2.04643E+00	1.7213E-01	4.0649E+03	4.0392E-01	0.000E+00	7.521E+00
1.762144E-01	1.38697E+00	1.5886E-01	3.5093E+03	4.3022E-01	0.000E+00	7.036E+00

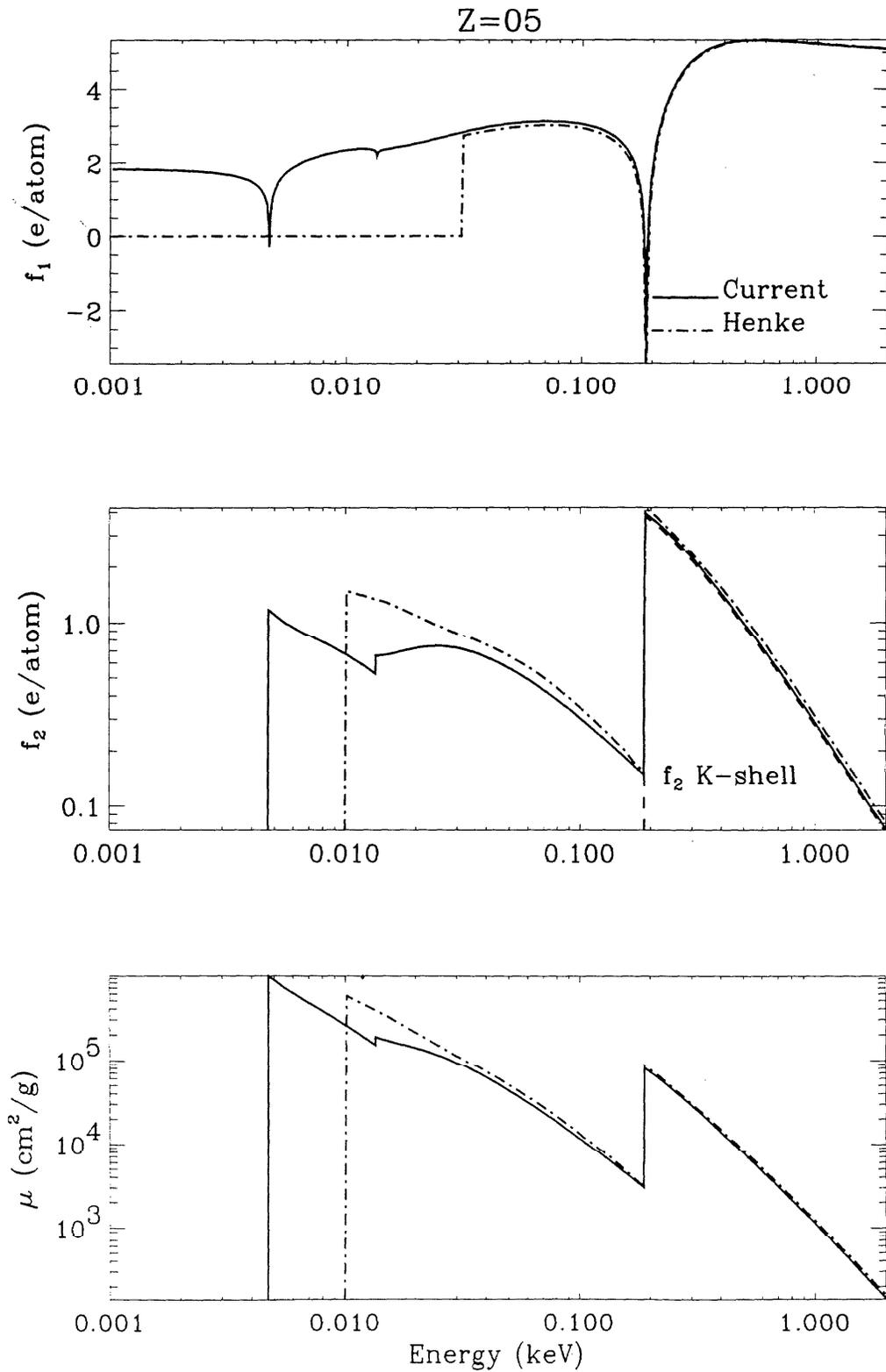
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 105

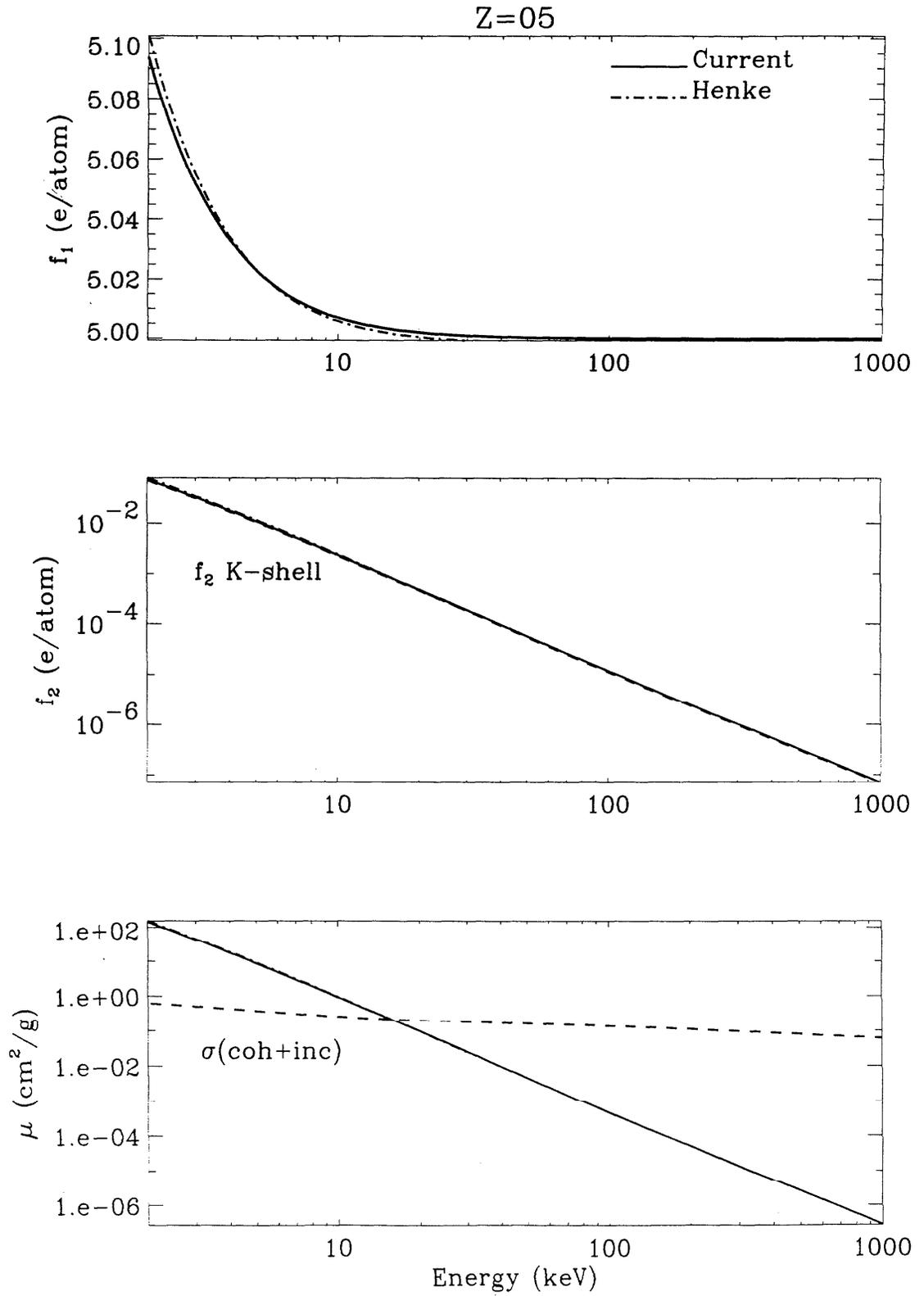
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.842400E-01	1.47973E-01	1.5049E-01	3.1797E+03	4.4792E-01	0.000E+00	6.729E+00
1.870600E-01	-1.46533E+00	1.4773E-01	3.0743E+03	4.5397E-01	0.000E+00	6.628E+00
1.878120E-01	-3.39747E+00	1.4701E-01	3.0470E+03	4.5557E-01	0.000E+00	6.602E+00
1.883732E-01	-2.53721E+00	3.9624E+00	8.1883E+04	4.5676E-01	7.886E+04	6.582E+00
1.889400E-01	-1.39355E+00	3.9498E+00	8.1378E+04	4.5796E-01	7.837E+04	6.562E+00
1.917600E-01	3.64335E-01	3.8885E+00	7.8936E+04	4.6387E-01	7.603E+04	6.466E+00
2.013709E-01	2.05708E+00	3.6926E+00	7.1382E+04	4.8341E-01	6.877E+04	6.157E+00
2.152655E-01	3.05311E+00	3.4372E+00	6.2155E+04	5.1000E-01	5.991E+04	5.760E+00
2.301188E-01	3.66377E+00	3.1815E+00	5.3819E+04	5.3639E-01	5.189E+04	5.388E+00
2.459970E-01	4.09461E+00	2.9293E+00	4.6354E+04	5.6241E-01	4.469E+04	5.040E+00
2.629708E-01	4.41524E+00	2.6840E+00	3.9731E+04	5.8789E-01	3.831E+04	4.715E+00
2.811158E-01	4.65896E+00	2.4491E+00	3.3914E+04	6.1267E-01	3.271E+04	4.410E+00
3.005128E-01	4.84566E+00	2.2270E+00	2.8848E+04	6.3658E-01	2.783E+04	4.126E+00
3.212482E-01	4.98856E+00	2.0189E+00	2.4464E+04	6.5948E-01	2.360E+04	3.859E+00
3.434143E-01	5.09713E+00	1.8254E+00	2.0692E+04	6.8119E-01	1.996E+04	3.610E+00
3.671099E-01	5.17848E+00	1.6466E+00	1.7460E+04	7.0158E-01	1.684E+04	3.377E+00
3.924405E-01	5.23814E+00	1.4821E+00	1.4702E+04	7.2051E-01	1.418E+04	3.159E+00
4.195189E-01	5.28048E+00	1.3316E+00	1.2356E+04	7.3785E-01	1.192E+04	2.955E+00
4.484657E-01	5.30900E+00	1.1942E+00	1.0366E+04	7.5350E-01	9.998E+03	2.765E+00
4.794098E-01	5.32654E+00	1.0694E+00	8.6832E+03	7.6735E-01	8.374E+03	2.586E+00
5.124891E-01	5.33541E+00	9.5617E-01	7.2628E+03	7.7932E-01	7.003E+03	2.419E+00
5.478508E-01	5.33746E+00	8.5376E-01	6.0663E+03	7.8935E-01	5.848E+03	2.263E+00
5.856525E-01	5.33457E+00	7.6132E-01	5.0604E+03	7.9738E-01	4.878E+03	2.117E+00
6.260625E-01	5.32733E+00	6.7805E-01	4.2160E+03	8.0339E-01	4.063E+03	1.980E+00
6.692609E-01	5.31709E+00	6.0317E-01	3.5083E+03	8.0735E-01	3.380E+03	1.853E+00
7.154399E-01	5.30466E+00	5.3594E-01	2.9161E+03	8.0927E-01	2.809E+03	1.733E+00
7.648052E-01	5.29073E+00	4.7567E-01	2.4211E+03	8.0917E-01	2.331E+03	1.621E+00
8.175768E-01	5.27579E+00	4.2165E-01	2.0076E+03	8.0709E-01	1.932E+03	1.516E+00
8.739896E-01	5.26025E+00	3.7337E-01	1.6630E+03	8.0308E-01	1.600E+03	1.419E+00
9.342948E-01	5.24449E+00	3.3033E-01	1.3763E+03	7.9720E-01	1.324E+03	1.327E+00
9.987612E-01	5.22885E+00	2.9207E-01	1.1384E+03	7.8954E-01	1.095E+03	1.241E+00
1.067676E+00	5.21494E+00	2.5600E-01	9.3338E+02	7.8020E-01	8.973E+02	1.161E+00
1.141345E+00	5.19961E+00	2.2436E-01	7.6520E+02	7.6926E-01	7.356E+02	1.086E+00
1.220098E+00	5.18432E+00	1.9667E-01	6.2737E+02	7.5686E-01	6.079E+02	1.016E+00
1.304285E+00	5.16952E+00	1.7231E-01	5.1428E+02	7.4311E-01	4.942E+02	9.506E-01
1.394281E+00	5.15544E+00	1.5101E-01	4.2162E+02	7.2814E-01	4.051E+02	8.892E-01
1.490486E+00	5.14217E+00	1.3235E-01	3.4565E+02	7.1208E-01	3.321E+02	8.318E-01
1.593329E+00	5.12975E+00	1.1599E-01	2.8337E+02	6.9507E-01	2.722E+02	7.781E-01
1.703269E+00	5.11821E+00	1.0165E-01	2.3231E+02	6.7725E-01	2.231E+02	7.279E-01
1.820795E+00	5.10752E+00	8.9083E-02	1.9045E+02	6.5876E-01	1.829E+02	6.809E-01
1.946430E+00	5.09766E+00	7.8072E-02	1.5614E+02	6.3972E-01	1.499E+02	6.370E-01
2.080733E+00	5.08860E+00	6.8421E-02	1.2801E+02	6.2029E-01	1.229E+02	5.959E-01
2.224304E+00	5.08029E+00	5.9964E-02	1.0494E+02	6.0057E-01	1.008E+02	5.574E-01
2.377781E+00	5.07270E+00	5.2552E-02	8.6034E+01	5.8070E-01	8.259E+01	5.214E-01
2.541848E+00	5.06577E+00	4.6056E-02	7.0532E+01	5.6080E-01	6.770E+01	4.878E-01
2.717235E+00	5.05947E+00	4.0363E-02	5.7824E+01	5.4097E-01	5.549E+01	4.563E-01
2.904724E+00	5.05375E+00	3.5374E-02	4.7406E+01	5.2131E-01	4.549E+01	4.268E-01
3.105150E+00	5.04875E+00	3.0872E-02	3.8702E+01	5.0193E-01	3.714E+01	3.993E-01
3.319406E+00	5.04408E+00	2.6837E-02	3.1473E+01	4.8291E-01	3.020E+01	3.735E-01
3.548445E+00	5.03978E+00	2.3320E-02	2.5583E+01	4.6432E-01	2.455E+01	3.494E-01
3.793288E+00	5.03582E+00	2.0164E-02	2.0693E+01	4.4623E-01	1.985E+01	3.269E-01
4.055024E+00	5.03219E+00	1.7435E-02	1.6737E+01	4.2870E-01	1.605E+01	3.058E-01
4.334821E+00	5.02888E+00	1.5075E-02	1.3538E+01	4.1178E-01	1.298E+01	2.860E-01
4.633924E+00	5.02588E+00	1.3035E-02	1.0950E+01	3.9551E-01	1.050E+01	2.676E-01
4.953664E+00	5.02316E+00	1.1271E-02	8.8568E+00	3.7992E-01	8.491E+00	2.503E-01
5.295467E+00	5.02071E+00	9.7453E-03	7.1638E+00	3.6503E-01	6.866E+00	2.341E-01
5.660855E+00	5.01850E+00	8.4264E-03	5.7945E+00	3.5086E-01	5.553E+00	2.190E-01
6.051453E+00	5.01652E+00	7.2860E-03	4.6868E+00	3.3742E-01	4.490E+00	2.049E-01
6.469004E+00	5.01474E+00	6.2986E-03	3.7902E+00	3.2471E-01	3.631E+00	1.917E-01
6.915365E+00	5.01314E+00	5.4448E-03	3.0649E+00	3.1272E-01	2.937E+00	1.793E-01
7.392525E+00	5.01172E+00	4.7067E-03	2.4785E+00	3.0145E-01	2.375E+00	1.677E-01
7.902609E+00	5.01044E+00	4.0687E-03	2.0042E+00	2.9088E-01	1.921E+00	1.569E-01
8.447890E+00	5.00930E+00	3.5172E-03	1.6207E+00	2.8098E-01	1.553E+00	1.468E-01
9.030794E+00	5.00828E+00	3.0360E-03	1.3087E+00	2.7175E-01	1.254E+00	1.373E-01
9.653919E+00	5.00737E+00	2.6070E-03	1.0512E+00	2.6314E-01	1.007E+00	1.284E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.032004E+01	5.00654E+00	2.2386E-03	8.4441E-01	2.5514E-01	8.090E-01	1.201E-01
1.103212E+01	5.00581E+00	1.9223E-03	6.7829E-01	2.4771E-01	6.497E-01	1.124E-01
1.179334E+01	5.00516E+00	1.6507E-03	5.4485E-01	2.4081E-01	5.218E-01	1.051E-01
1.260708E+01	5.00457E+00	1.4174E-03	4.3766E-01	2.3442E-01	4.191E-01	9.834E-02
1.347697E+01	5.00405E+00	1.2171E-03	3.5156E-01	2.2850E-01	3.366E-01	9.200E-02
1.440688E+01	5.00359E+00	1.0451E-03	2.8240E-01	2.2302E-01	2.704E-01	8.606E-02
1.540095E+01	5.00318E+00	8.9746E-04	2.2684E-01	2.1794E-01	2.171E-01	8.050E-02
1.646362E+01	5.00282E+00	7.7065E-04	1.8221E-01	2.1322E-01	1.744E-01	7.531E-02
1.759961E+01	5.00249E+00	6.6175E-04	1.4637E-01	2.0884E-01	1.401E-01	7.045E-02
1.881398E+01	5.00220E+00	5.6825E-04	1.1757E-01	2.0476E-01	1.125E-01	6.590E-02
2.011215E+01	5.00195E+00	4.8795E-04	9.4443E-02	2.0095E-01	9.036E-02	6.165E-02
2.149988E+01	5.00172E+00	4.1900E-04	7.5864E-02	1.9738E-01	7.257E-02	5.767E-02
2.298338E+01	5.00152E+00	3.5980E-04	6.0940E-02	1.9403E-01	5.829E-02	5.395E-02
2.456923E+01	5.00135E+00	3.0896E-04	4.8951E-02	1.9086E-01	4.681E-02	5.046E-02
2.626450E+01	5.00119E+00	2.6530E-04	3.9321E-02	1.8786E-01	3.760E-02	4.721E-02
2.807676E+01	5.00105E+00	2.2730E-04	3.1514E-02	1.8499E-01	3.013E-02	4.416E-02
3.001405E+01	5.00093E+00	1.9460E-04	2.5239E-02	1.8224E-01	2.412E-02	4.131E-02
3.208502E+01	5.00082E+00	1.6660E-04	2.0213E-02	1.7959E-01	1.931E-02	3.864E-02
3.429889E+01	5.00072E+00	1.4263E-04	1.6188E-02	1.7702E-01	1.546E-02	3.615E-02
3.666551E+01	5.00064E+00	1.2211E-04	1.2965E-02	1.7451E-01	1.238E-02	3.381E-02
3.919543E+01	5.00056E+00	1.0455E-04	1.0383E-02	1.7206E-01	9.914E-03	3.163E-02
4.189992E+01	5.00049E+00	8.9505E-05	8.3155E-03	1.6964E-01	7.938E-03	2.959E-02
4.479101E+01	5.00044E+00	7.6628E-05	6.6597E-03	1.6724E-01	6.356E-03	2.768E-02
4.788159E+01	5.00038E+00	6.5604E-05	5.3336E-03	1.6487E-01	5.089E-03	2.589E-02
5.118542E+01	5.00034E+00	5.6166E-05	4.2715E-03	1.6250E-01	4.075E-03	2.422E-02
5.471721E+01	5.00030E+00	4.8086E-05	3.4210E-03	1.6013E-01	3.262E-03	2.266E-02
5.849270E+01	5.00026E+00	4.1169E-05	2.7398E-03	1.5776E-01	2.612E-03	2.120E-02
6.252870E+01	5.00023E+00	3.5246E-05	2.1942E-03	1.5538E-01	2.091E-03	1.983E-02
6.684318E+01	5.00020E+00	3.0176E-05	1.7573E-03	1.5298E-01	1.675E-03	1.855E-02
7.145536E+01	5.00018E+00	2.5835E-05	1.4074E-03	1.5057E-01	1.341E-03	1.735E-02
7.638578E+01	5.00016E+00	2.2118E-05	1.1272E-03	1.4815E-01	1.074E-03	1.623E-02
8.165640E+01	5.00014E+00	1.8973E-05	9.0450E-04	1.4571E-01	8.613E-04	1.518E-02
8.729069E+01	5.00012E+00	1.6348E-05	7.2902E-04	1.4325E-01	6.943E-04	1.420E-02
9.331374E+01	5.00011E+00	1.4085E-05	5.8758E-04	1.4077E-01	5.596E-04	1.329E-02
9.975239E+01	5.00009E+00	1.2136E-05	4.7359E-04	1.3828E-01	4.511E-04	1.243E-02
1.066353E+02	5.00008E+00	1.0456E-05	3.8171E-04	1.3577E-01	3.636E-04	1.163E-02
1.139931E+02	5.00007E+00	9.0092E-06	3.0765E-04	1.3325E-01	2.931E-04	1.088E-02
1.218587E+02	5.00006E+00	7.7624E-06	2.4797E-04	1.3072E-01	2.362E-04	1.017E-02
1.302669E+02	5.00006E+00	6.6881E-06	1.9986E-04	1.2818E-01	1.904E-04	9.518E-03
1.392553E+02	5.00005E+00	5.7625E-06	1.6108E-04	1.2564E-01	1.535E-04	8.903E-03
1.488640E+02	5.00004E+00	4.9650E-06	1.2983E-04	1.2309E-01	1.237E-04	8.329E-03
1.591356E+02	5.00004E+00	4.2779E-06	1.0464E-04	1.2054E-01	9.971E-05	7.791E-03
1.701159E+02	5.00003E+00	3.6858E-06	8.4342E-05	1.1800E-01	8.037E-05	7.288E-03
1.818539E+02	5.00003E+00	3.1757E-06	6.7979E-05	1.1546E-01	6.478E-05	6.818E-03
1.944018E+02	5.00003E+00	2.7362E-06	5.4790E-05	1.1294E-01	5.222E-05	6.378E-03
2.078156E+02	5.00002E+00	2.3575E-06	4.4161E-05	1.1042E-01	4.209E-05	5.966E-03
2.221548E+02	5.00002E+00	2.0313E-06	3.5593E-05	1.0792E-01	3.392E-05	5.581E-03
2.374835E+02	5.00002E+00	1.7502E-06	2.8688E-05	1.0544E-01	2.734E-05	5.221E-03
2.538699E+02	5.00002E+00	1.5079E-06	2.3122E-05	1.0298E-01	2.204E-05	4.884E-03
2.713869E+02	5.00001E+00	1.2993E-06	1.8636E-05	1.0055E-01	1.777E-05	4.569E-03
2.901126E+02	5.00001E+00	1.1194E-06	1.5021E-05	9.8137E-02	1.432E-05	4.274E-03
3.101304E+02	5.00001E+00	9.6452E-07	1.2107E-05	9.5756E-02	1.154E-05	3.998E-03
3.315294E+02	5.00001E+00	8.3104E-07	9.7578E-06	9.3406E-02	9.304E-06	3.740E-03
3.544049E+02	5.00001E+00	7.1603E-07	7.8647E-06	9.1089E-02	7.499E-06	3.498E-03
3.788588E+02	5.00001E+00	6.1693E-07	6.3389E-06	8.8808E-02	6.045E-06	3.273E-03
4.050001E+02	5.00001E+00	5.3155E-07	5.1091E-06	8.6563E-02	4.872E-06	3.061E-03
4.329451E+02	5.00001E+00	4.5799E-07	4.1179E-06	8.4356E-02	3.927E-06	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 109

C Z = 6

Atomic weight = 1.201100E+01 g/mol, nominal density ρ (g/cm³) = 2.2600E+00
 $\mu_{\text{ph}}(\text{barns/atom}) = \mu(\text{cm}^2/\text{g}) \times 1.99447\text{E}+01$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 3.50348\text{E}+06$

Edges. Edge energies (keV):

K 2.83800E-01 L I 1.95100E-02 L II 6.40000E-03
 Relativistic correction estimate f_{rel} (H82,3/5CL) = -4.1810E-03, -1.8000E-03 e/atom
 Nuclear Thomson correction $f_{\text{NT}} = -1.6442\text{E}-03$ e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
6.272000E-03	-3.20134E-01	0.0000E+00	0.0000E+00	6.6098E-04	0.000E+00	1.977E+02
6.368000E-03	-1.17579E+00	0.0000E+00	0.0000E+00	6.9744E-04	0.000E+00	1.947E+02
6.393600E-03	-2.18154E+00	0.0000E+00	0.0000E+00	7.0737E-04	0.000E+00	1.939E+02
6.432000E-03	-1.16186E+00	1.9697E+00	1.0729E+06	7.2244E-04	0.000E+00	1.928E+02
6.528000E-03	-2.76671E-01	1.9598E+00	1.0518E+06	7.6100E-04	0.000E+00	1.899E+02
1.069000E-02	2.10173E+00	1.7392E+00	5.6999E+05	3.8208E-03	0.000E+00	1.160E+02
1.142761E-02	2.22488E+00	1.7134E+00	5.2530E+05	4.6715E-03	0.000E+00	1.085E+02
1.221612E-02	2.33994E+00	1.6847E+00	4.8316E+05	5.6888E-03	0.000E+00	1.015E+02
1.305903E-02	2.44742E+00	1.6524E+00	4.4330E+05	6.8997E-03	0.000E+00	9.494E+01
1.396010E-02	2.54710E+00	1.6161E+00	4.0558E+05	8.3352E-03	0.000E+00	8.881E+01
1.492335E-02	2.63805E+00	1.5757E+00	3.6992E+05	1.0029E-02	0.000E+00	8.308E+01
1.595306E-02	2.71844E+00	1.5311E+00	3.3626E+05	1.2021E-02	0.000E+00	7.772E+01
1.705382E-02	2.78446E+00	1.4826E+00	3.0459E+05	1.4351E-02	0.000E+00	7.270E+01
1.823053E-02	2.82559E+00	1.4304E+00	2.7489E+05	1.7066E-02	0.000E+00	6.801E+01
1.911980E-02	2.80931E+00	1.3911E+00	2.5491E+05	1.9268E-02	0.000E+00	6.485E+01
1.941245E-02	2.75154E+00	1.3783E+00	2.4874E+05	2.0019E-02	0.000E+00	6.387E+01
1.948844E-02	2.67983E+00	1.3749E+00	2.4718E+05	2.0217E-02	0.000E+00	6.362E+01
1.949049E-02	2.67501E+00	1.3748E+00	2.4713E+05	2.0222E-02	0.000E+00	6.361E+01
1.960755E-02	2.67543E+00	1.5242E+00	2.7234E+05	2.0528E-02	0.000E+00	6.323E+01
1.990020E-02	2.82926E+00	1.5191E+00	2.6745E+05	2.1302E-02	0.000E+00	6.230E+01
2.083314E-02	2.91938E+00	1.5052E+00	2.5312E+05	2.3838E-02	0.000E+00	5.951E+01
2.227063E-02	3.00738E+00	1.4898E+00	2.3437E+05	2.8046E-02	0.000E+00	5.567E+01
2.380730E-02	3.08738E+00	1.4761E+00	2.1723E+05	3.2846E-02	0.000E+00	5.208E+01
2.545001E-02	3.16576E+00	1.4626E+00	2.0134E+05	3.8322E-02	0.000E+00	4.872E+01
2.720606E-02	3.24448E+00	1.4477E+00	1.8643E+05	4.4544E-02	0.000E+00	4.557E+01
2.908327E-02	3.32364E+00	1.4301E+00	1.7227E+05	5.1583E-02	0.000E+00	4.263E+01
3.109002E-02	3.40280E+00	1.4091E+00	1.5879E+05	5.9515E-02	0.000E+00	3.988E+01
3.323523E-02	3.48136E+00	1.3844E+00	1.4594E+05	6.8414E-02	0.000E+00	3.731E+01
3.552846E-02	3.55864E+00	1.3557E+00	1.3369E+05	7.8357E-02	0.000E+00	3.490E+01
3.797993E-02	3.63385E+00	1.3230E+00	1.2204E+05	8.9421E-02	0.000E+00	3.264E+01
4.060054E-02	3.70629E+00	1.2864E+00	1.1100E+05	1.0168E-01	0.000E+00	3.054E+01
4.340198E-02	3.77526E+00	1.2462E+00	1.0059E+05	1.1521E-01	0.000E+00	2.857E+01
4.639671E-02	3.84022E+00	1.2028E+00	9.0829E+04	1.3007E-01	0.000E+00	2.672E+01
4.959809E-02	3.90069E+00	1.1569E+00	8.1721E+04	1.4633E-01	0.000E+00	2.500E+01
5.302035E-02	3.95635E+00	1.1089E+00	7.3276E+04	1.6405E-01	0.000E+00	2.338E+01
5.667876E-02	4.00697E+00	1.0595E+00	6.5488E+04	1.8328E-01	0.000E+00	2.187E+01
6.058959E-02	4.05263E+00	1.0091E+00	5.8347E+04	2.0405E-01	0.000E+00	2.046E+01
6.477028E-02	4.09290E+00	9.5827E-01	5.1834E+04	2.2640E-01	0.000E+00	1.914E+01
6.923942E-02	4.12801E+00	9.0756E-01	4.5922E+04	2.5035E-01	0.000E+00	1.791E+01
7.401695E-02	4.15805E+00	8.5736E-01	4.0582E+04	2.7589E-01	0.000E+00	1.675E+01
7.912411E-02	4.18316E+00	8.0800E-01	3.5777E+04	3.0302E-01	0.000E+00	1.567E+01
8.458368E-02	4.20340E+00	7.5955E-01	3.1461E+04	3.3170E-01	0.000E+00	1.466E+01
9.041995E-02	4.21865E+00	7.1222E-01	2.7596E+04	3.6190E-01	0.000E+00	1.371E+01
9.665893E-02	4.22883E+00	6.6630E-01	2.4151E+04	3.9356E-01	0.000E+00	1.283E+01
1.033284E-01	4.23389E+00	6.2204E-01	2.1091E+04	4.2659E-01	0.000E+00	1.200E+01
1.104581E-01	4.23373E+00	5.7959E-01	1.8383E+04	4.6090E-01	0.000E+00	1.122E+01
1.180797E-01	4.22817E+00	5.3908E-01	1.5995E+04	4.9637E-01	0.000E+00	1.050E+01
1.262272E-01	4.21665E+00	4.9886E-01	1.3846E+04	5.3287E-01	0.000E+00	9.822E+00
1.349368E-01	4.19786E+00	4.6044E-01	1.1955E+04	5.7025E-01	0.000E+00	9.188E+00
1.442475E-01	4.17119E+00	4.2445E-01	1.0309E+04	6.0834E-01	0.000E+00	8.595E+00
1.542005E-01	4.13557E+00	3.9083E-01	8.7999E+03	6.4696E-01	0.000E+00	8.040E+00
1.648404E-01	4.08928E+00	3.5950E-01	7.6408E+03	6.8590E-01	0.000E+00	7.521E+00
1.762144E-01	4.02965E+00	3.3037E-01	6.5684E+03	7.2497E-01	0.000E+00	7.036E+00
1.883732E-01	3.95250E+00	3.0333E-01	5.6416E+03	7.6393E-01	0.000E+00	6.582E+00
2.013709E-01	3.85169E+00	2.7829E-01	4.8417E+03	8.0257E-01	0.000E+00	6.157E+00

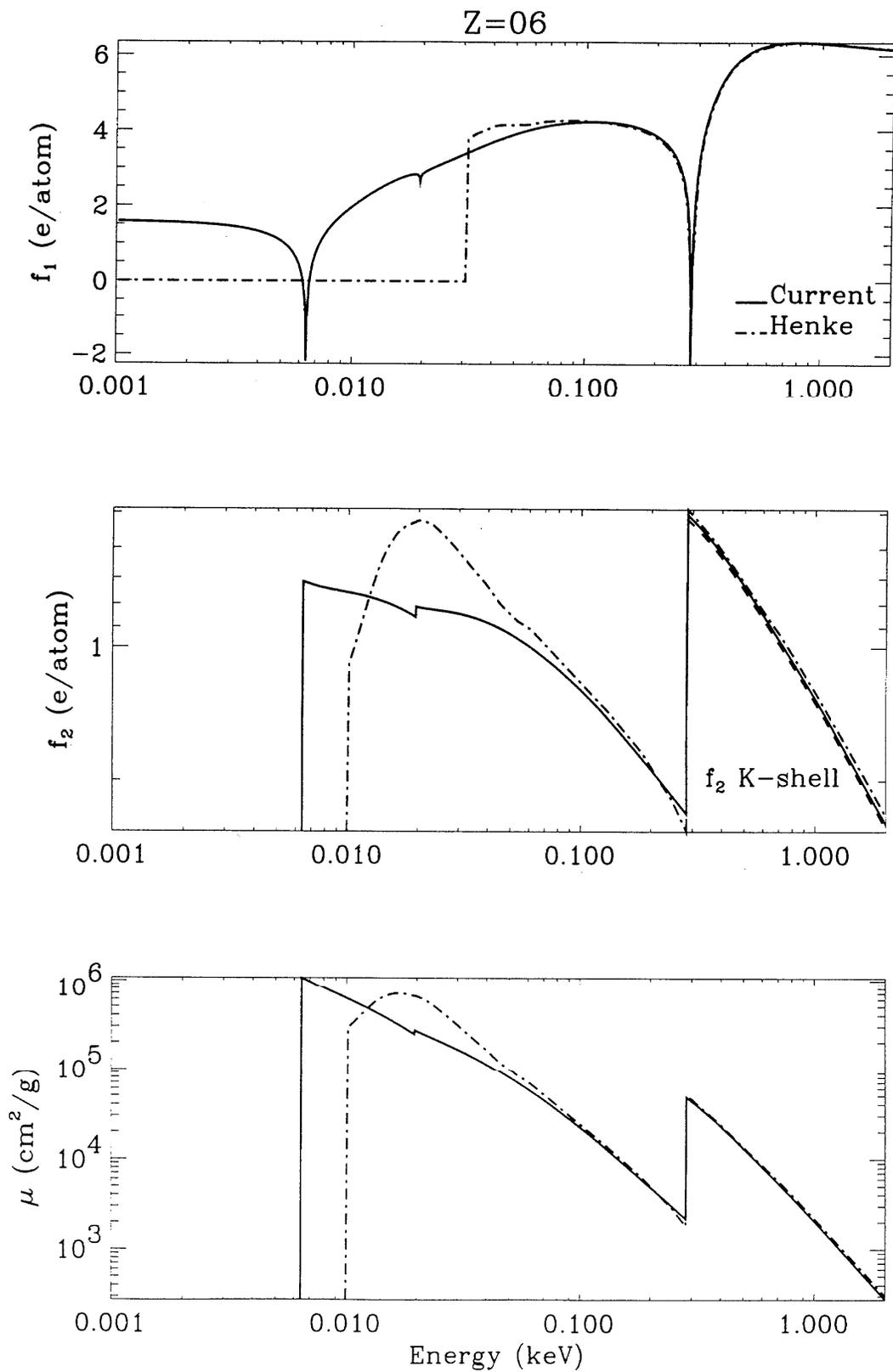
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

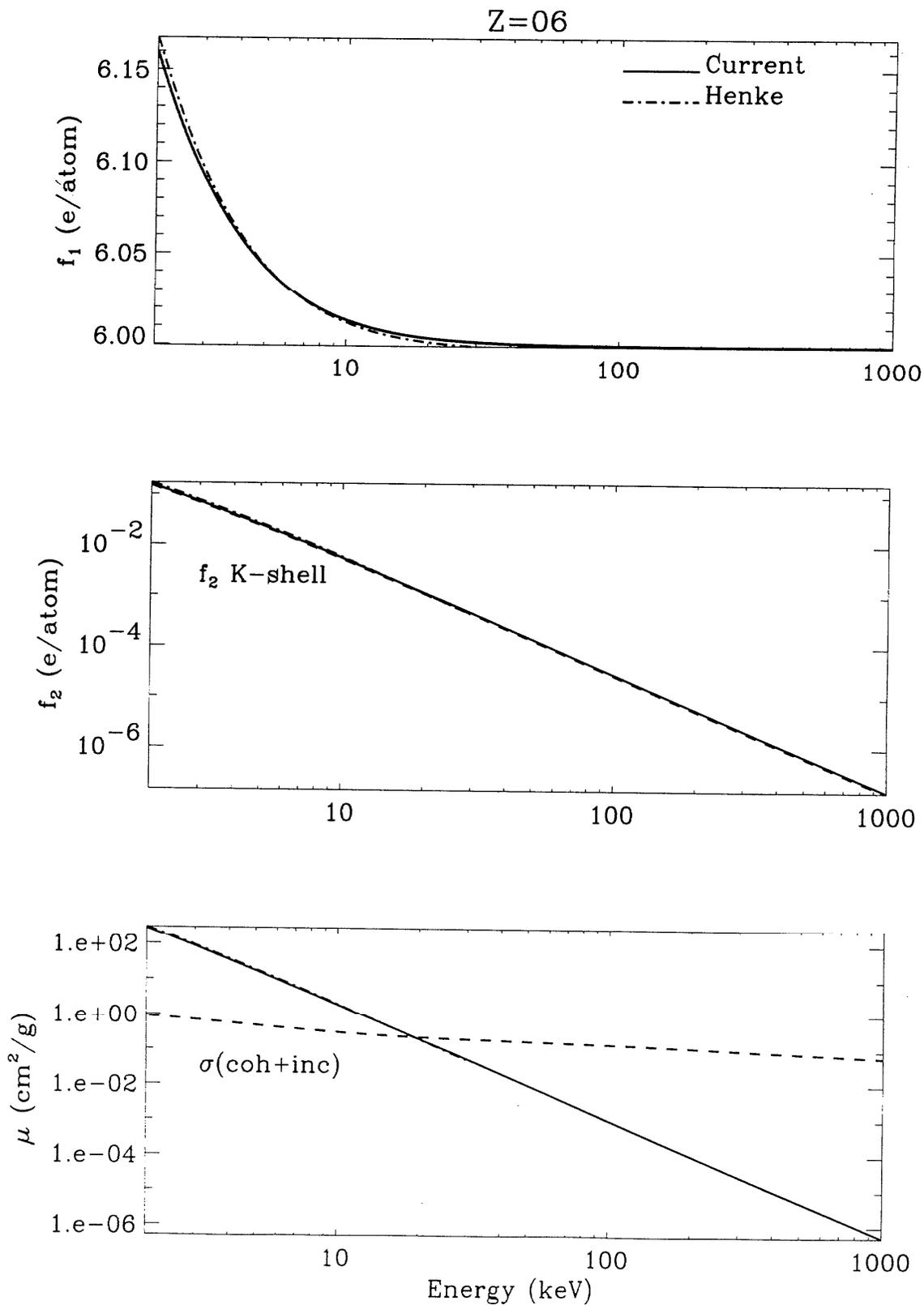
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.152655E-01	3.71374E+00	2.5513E-01	4.1523E+03	8.4066E-01	0.000E+00	5.760E+00
2.301188E-01	3.51819E+00	2.3374E-01	3.5587E+03	8.7794E-01	0.000E+00	5.388E+00
2.459970E-01	3.21423E+00	2.1403E-01	3.0481E+03	9.1419E-01	0.000E+00	5.040E+00
2.629708E-01	2.64704E+00	1.9587E-01	2.6095E+03	9.4918E-01	0.000E+00	4.715E+00
2.781240E-01	1.26093E+00	1.8175E-01	2.2894E+03	9.7741E-01	0.000E+00	4.458E+00
2.811158E-01	4.07656E-01	1.7916E-01	2.2329E+03	9.8267E-01	0.000E+00	4.410E+00
2.823810E-01	-3.35665E-01	1.7809E-01	2.2095E+03	9.8486E-01	0.000E+00	4.391E+00
2.835162E-01	-2.24717E+00	1.7713E-01	2.1889E+03	9.8681E-01	0.000E+00	4.373E+00
2.852190E-01	-2.65349E-01	3.9387E+00	4.8381E+04	9.8972E-01	4.622E+04	4.347E+00
2.894760E-01	1.47293E+00	3.8777E+00	4.6931E+04	9.9684E-01	4.485E+04	4.283E+00
3.005128E-01	2.89123E+00	3.7279E+00	4.3461E+04	1.0144E+00	4.155E+04	4.126E+00
3.212482E-01	4.00159E+00	3.4725E+00	3.7871E+04	1.0443E+00	3.624E+04	3.859E+00
3.434143E-01	4.65259E+00	3.2143E+00	3.2792E+04	1.0720E+00	3.140E+04	3.610E+00
3.671099E-01	5.10424E+00	2.9562E+00	2.8212E+04	1.0974E+00	2.702E+04	3.377E+00
3.924405E-01	5.43616E+00	2.7033E+00	2.4134E+04	1.1203E+00	2.312E+04	3.159E+00
4.195189E-01	5.68561E+00	2.4612E+00	2.0554E+04	1.1406E+00	1.970E+04	2.955E+00
4.484657E-01	5.87450E+00	2.2326E+00	1.7441E+04	1.1582E+00	1.762E+04	2.765E+00
4.794098E-01	6.01732E+00	2.0190E+00	1.4755E+04	1.1729E+00	1.415E+04	2.586E+00
5.124891E-01	6.12442E+00	1.8212E+00	1.2450E+04	1.1847E+00	1.194E+04	2.419E+00
5.478508E-01	6.20354E+00	1.6391E+00	1.0482E+04	1.1935E+00	1.005E+04	2.263E+00
5.856525E-01	6.26062E+00	1.4724E+00	8.8081E+03	1.1993E+00	8.446E+03	2.117E+00
6.260625E-01	6.30033E+00	1.3204E+00	7.3890E+03	1.2020E+00	7.085E+03	1.980E+00
6.692609E-01	6.32635E+00	1.1823E+00	6.1889E+03	1.2018E+00	5.933E+03	1.853E+00
7.154399E-01	6.34162E+00	1.0571E+00	5.1765E+03	1.1986E+00	4.962E+03	1.733E+00
7.648052E-01	6.34849E+00	9.4391E-01	4.3239E+03	1.1926E+00	4.144E+03	1.621E+00
8.175768E-01	6.34886E+00	8.4179E-01	3.6072E+03	1.1838E+00	3.456E+03	1.516E+00
8.739896E-01	6.34469E+00	7.4981E-01	3.0057E+03	1.1722E+00	2.879E+03	1.419E+00
9.342948E-01	6.33647E+00	6.6709E-01	2.5015E+03	1.1582E+00	2.395E+03	1.327E+00
9.987612E-01	6.32562E+00	5.9282E-01	2.0795E+03	1.1417E+00	1.990E+03	1.241E+00
1.067676E+00	6.31267E+00	5.2585E-01	1.7255E+03	1.1229E+00	1.652E+03	1.161E+00
1.141345E+00	6.29863E+00	4.6573E-01	1.4296E+03	1.1021E+00	1.369E+03	1.086E+00
1.220098E+00	6.28281E+00	4.0956E-01	1.1760E+03	1.0794E+00	1.126E+03	1.016E+00
1.304285E+00	6.26551E+00	3.6016E-01	9.6744E+02	1.0550E+00	9.260E+02	9.506E-01
1.394281E+00	6.24774E+00	3.1672E-01	7.9585E+02	1.0291E+00	7.616E+02	8.892E-01
1.490486E+00	6.23009E+00	2.7853E-01	6.5469E+02	1.0018E+00	6.264E+02	8.318E-01
1.593329E+00	6.21289E+00	2.4494E-01	5.3858E+02	9.7349E-01	5.152E+02	7.781E-01
1.703269E+00	6.19636E+00	2.1540E-01	4.4306E+02	9.4424E-01	4.238E+02	7.279E-01
1.820795E+00	6.18064E+00	1.8942E-01	3.6448E+02	9.1427E-01	3.485E+02	6.809E-01
1.946430E+00	6.16581E+00	1.6658E-01	2.9984E+02	8.8379E-01	2.867E+02	6.370E-01
2.080733E+00	6.15192E+00	1.4650E-01	2.4667E+02	8.5298E-01	2.358E+02	5.959E-01
2.224304E+00	6.13897E+00	1.2883E-01	2.0292E+02	8.2201E-01	1.939E+02	5.574E-01
2.377781E+00	6.12696E+00	1.1330E-01	1.6694E+02	7.9106E-01	1.595E+02	5.214E-01
2.541848E+00	6.11588E+00	9.9638E-02	1.3733E+02	7.6028E-01	1.312E+02	4.878E-01
2.717235E+00	6.10571E+00	8.7625E-02	1.1298E+02	7.2982E-01	1.079E+02	4.563E-01
2.904724E+00	6.09643E+00	7.7061E-02	9.2946E+01	6.9982E-01	8.875E+01	4.268E-01
3.105150E+00	6.08790E+00	6.7420E-02	7.6069E+01	6.7040E-01	7.263E+01	3.993E-01
3.319406E+00	6.07984E+00	5.8701E-02	6.1956E+01	6.4168E-01	5.915E+01	3.735E-01
3.548445E+00	6.07234E+00	5.1109E-02	5.0461E+01	6.1373E-01	4.818E+01	3.494E-01
3.793288E+00	6.06543E+00	4.4499E-02	4.1099E+01	5.8666E-01	3.924E+01	3.269E-01
4.055024E+00	6.05909E+00	3.8744E-02	3.3474E+01	5.6054E-01	3.196E+01	3.058E-01
4.334821E+00	6.05329E+00	3.3733E-02	2.7264E+01	5.3541E-01	2.603E+01	2.860E-01
4.633924E+00	6.04802E+00	2.9370E-02	2.2206E+01	5.1132E-01	2.121E+01	2.676E-01
4.953664E+00	6.04323E+00	2.5572E-02	1.8086E+01	4.8832E-01	1.727E+01	2.503E-01
5.295467E+00	6.03890E+00	2.2265E-02	1.4731E+01	4.6642E-01	1.407E+01	2.341E-01
5.660855E+00	6.03498E+00	1.9289E-02	1.1938E+01	4.4563E-01	1.140E+01	2.190E-01
6.051453E+00	6.03140E+00	1.6703E-02	9.6701E+00	4.2596E-01	9.231E+00	2.049E-01
6.469004E+00	6.02815E+00	1.4463E-02	7.8329E+00	4.0741E-01	7.475E+00	1.917E-01
6.915365E+00	6.02520E+00	1.2524E-02	6.3448E+00	3.8995E-01	6.054E+00	1.793E-01
7.392525E+00	6.02255E+00	1.0844E-02	5.1394E+00	3.7356E-01	4.902E+00	1.677E-01
7.902609E+00	6.02016E+00	9.3904E-03	4.1630E+00	3.5823E-01	3.970E+00	1.569E-01
8.447890E+00	6.01801E+00	8.1313E-03	3.3722E+00	3.4390E-01	3.215E+00	1.468E-01
9.030794E+00	6.01610E+00	7.0314E-03	2.7278E+00	3.3056E-01	3.056E+00	1.373E-01
9.653919E+00	6.01439E+00	6.0514E-03	2.1961E+00	3.1815E-01	2.093E+00	1.284E-01
1.032004E+01	6.01284E+00	5.2079E-03	1.7680E+00	3.0663E-01	1.685E+00	1.201E-01
1.103212E+01	6.01144E+00	4.4820E-03	1.4234E+00	2.9595E-01	1.356E+00	1.124E-01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 111

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.179334E+01	6.01018E+00	3.8573E-03	1.1459E+00	2.8607E-01	1.092E+00	1.051E-01
1.260708E+01	6.00906E+00	3.3197E-03	9.2254E-01	2.7693E-01	8.788E-01	9.834E-02
1.347697E+01	6.00805E+00	2.8570E-03	7.4271E-01	2.6848E-01	7.074E-01	9.200E-02
1.440688E+01	6.00715E+00	2.4588E-03	5.9793E-01	2.6068E-01	5.694E-01	8.606E-02
1.540095E+01	6.00635E+00	2.1161E-03	4.8138E-01	2.5347E-01	4.583E-01	8.050E-02
1.646362E+01	6.00563E+00	1.8212E-03	3.8755E-01	2.4680E-01	3.689E-01	7.531E-02
1.759961E+01	6.00499E+00	1.5673E-03	3.1200E-01	2.4063E-01	2.970E-01	7.045E-02
1.881398E+01	6.00443E+00	1.3489E-03	2.5119E-01	2.3491E-01	2.391E-01	6.590E-02
2.011215E+01	6.00392E+00	1.1609E-03	2.0222E-01	2.2959E-01	1.924E-01	6.165E-02
2.149988E+01	6.00348E+00	9.9909E-04	1.6281E-01	2.2464E-01	1.549E-01	5.767E-02
2.298338E+01	6.00308E+00	8.5985E-04	1.3107E-01	2.2002E-01	1.247E-01	5.395E-02
2.456923E+01	6.00272E+00	7.4001E-04	1.0552E-01	2.1568E-01	1.004E-01	5.046E-02
2.626450E+01	6.00241E+00	6.3687E-04	8.4954E-02	2.1159E-01	8.079E-02	4.721E-02
2.807676E+01	6.00213E+00	5.4642E-04	6.8184E-02	2.0772E-01	6.483E-02	4.416E-02
3.001405E+01	6.00189E+00	4.6835E-04	5.4669E-02	2.0404E-01	5.197E-02	4.131E-02
3.208502E+01	6.00167E+00	4.0143E-04	4.3834E-02	2.0052E-01	4.166E-02	3.864E-02
3.429889E+01	6.00148E+00	3.4407E-04	3.5146E-02	1.9714E-01	3.339E-02	3.615E-02
3.666551E+01	6.00130E+00	2.9491E-04	2.8180E-02	1.9388E-01	2.677E-02	3.381E-02
3.919543E+01	6.00115E+00	2.5277E-04	2.2594E-02	1.9071E-01	2.146E-02	3.163E-02
4.189992E+01	6.00102E+00	2.1666E-04	1.8116E-02	1.8761E-01	1.720E-02	2.959E-02
4.479101E+01	6.00090E+00	1.8570E-04	1.4525E-02	1.8458E-01	1.379E-02	2.768E-02
4.788159E+01	6.00079E+00	1.5917E-04	1.1646E-02	1.8160E-01	1.105E-02	2.589E-02
5.118542E+01	6.00070E+00	1.3643E-04	9.3381E-03	1.7865E-01	8.861E-03	2.422E-02
5.471721E+01	6.00062E+00	1.1694E-04	7.4873E-03	1.7573E-01	7.103E-03	2.266E-02
5.849270E+01	6.00054E+00	1.0023E-04	6.0033E-03	1.7283E-01	5.694E-03	2.120E-02
6.252870E+01	6.00048E+00	8.5909E-05	4.8135E-03	1.6993E-01	4.564E-03	1.983E-02
6.684318E+01	6.00042E+00	7.3635E-05	3.8595E-03	1.6705E-01	3.659E-03	1.855E-02
7.145536E+01	6.00037E+00	6.3115E-05	3.0945E-03	1.6417E-01	2.933E-03	1.735E-02
7.638578E+01	6.00033E+00	5.4098E-05	2.4812E-03	1.6128E-01	2.351E-03	1.623E-02
8.165640E+01	6.00029E+00	4.6381E-05	1.9900E-03	1.5840E-01	1.885E-03	1.518E-02
8.729069E+01	6.00025E+00	3.9791E-05	1.5970E-03	1.5551E-01	1.513E-03	1.420E-02
9.331374E+01	6.00022E+00	3.4136E-05	1.2816E-03	1.5262E-01	1.214E-03	1.329E-02
9.975239E+01	6.00020E+00	2.9285E-05	1.0286E-03	1.4973E-01	9.737E-04	1.243E-02
1.066353E+02	6.00017E+00	2.5124E-05	8.2544E-04	1.4683E-01	7.813E-04	1.163E-02
1.139931E+02	6.00015E+00	2.1554E-05	6.6244E-04	1.4394E-01	6.269F-04	1.088E-02
1.218587E+02	6.00013E+00	1.8491E-05	5.3162E-04	1.4105E-01	5.030E-04	1.017E-02
1.302669E+02	6.00012E+00	1.5863E-05	4.2664E-04	1.3816E-01	4.036E-04	9.518E-03
1.392553E+02	6.00010E+00	1.3609E-05	3.4239E-04	1.3528E-01	3.238E-04	8.903E-03
1.488640E+02	6.00009E+00	1.1675E-05	2.7478E-04	1.3241E-01	2.598E-04	8.329E-03
1.591356E+02	6.00008E+00	1.0016E-05	2.2052E-04	1.2956E-01	2.085E-04	7.791E-03
1.701159E+02	6.00007E+00	8.5931E-06	1.7697E-04	1.2672E-01	1.673E-04	7.288E-03
1.818539E+02	6.00006E+00	7.3720E-06	1.4203E-04	1.2390E-01	1.342E-04	6.818E-03
1.944018E+02	6.00005E+00	6.3245E-06	1.1398E-04	1.2111E-01	1.077E-04	6.378E-03
2.078156E+02	6.00005E+00	5.4258E-06	9.1472E-05	1.1834E-01	8.641E-05	5.966E-03
2.221548E+02	6.00004E+00	4.6549E-06	7.3409E-05	1.1560E-01	6.933E-05	5.581E-03
2.374835E+02	6.00004E+00	3.9934E-06	5.8913E-05	1.1290E-01	5.563E-05	5.221E-03
2.538699E+02	6.00003E+00	3.4260E-06	4.7280E-05	1.1022E-01	4.463E-05	4.884E-03
2.713869E+02	6.00003E+00	2.9392E-06	3.7944E-05	1.0759E-01	3.581E-05	4.569E-03
2.901126E+02	6.00003E+00	2.5216E-06	3.0451E-05	1.0500E-01	2.873E-05	4.274E-03
3.101304E+02	6.00002E+00	2.1633E-06	2.4438E-05	1.0245E-01	2.306E-05	3.998E-03
3.315294E+02	6.00002E+00	1.8559E-06	1.9612E-05	9.9939E-02	1.850E-05	3.740E-03
3.544049E+02	6.00002E+00	1.5922E-06	1.5740E-05	9.7479E-02	1.484E-05	3.498E-03
3.788588E+02	6.00001E+00	1.3660E-06	1.2632E-05	9.5068E-02	1.191E-05	3.273E-03
4.050001E+02	6.00001E+00	1.1719E-06	1.0137E-05	9.2706E-02	9.556E-06	3.061E-03
4.329451E+02	6.00001E+00	1.0054E-06	8.1356E-06	9.0395E-02	7.667E-06	2.864E-03





N $Z = 7$ Atomic weight = 1.400670E+01 g/mol, nominal density ρ (g/cm³) = 1.1650E-03 μ_a (barns/atom) = μ (cm²/g) \times 2.32587E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.00430E+06

4 edges. Edge energies (keV):

K 4.01600E-01 L I 2.63100E-02 L II 9.20000E-03 L III 9.20000E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -5.7982E-03, -3.0000E-03 e/atomNuclear Thomson correction f_{NT} = -1.9191E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
9.016000E-03	-9.91623E-01	0.0000E+00	0.0000E+00	1.3099E-03	0.000E+00	1.375E+02
9.154000E-03	-1.99965E+00	0.0000E+00	0.0000E+00	1.3815E-03	0.000E+00	1.354E+02
9.190800E-03	-3.16894E+00	0.0000E+00	0.0000E+00	1.4010E-03	0.000E+00	1.349E+02
9.246000E-03	-2.00383E+00	2.2815E+00	7.4131E+05	1.4306E-03	0.000E+00	1.341E+02
9.384000E-03	-1.00020E+00	2.2891E+00	7.3286E+05	1.5063E-03	0.000E+00	1.321E+02
1.069000E-02	5.47159E-01	2.3575E+00	6.6255E+05	2.3477E-03	0.000E+00	1.160E+02
1.142761E-02	8.70870E-01	2.3922E+00	6.2891E+05	2.9276E-03	0.000E+00	1.085E+02
1.221612E-02	1.13142E+00	2.4252E+00	5.9643E+05	3.6348E-03	0.000E+00	1.015E+02
1.305903E-02	1.35881E+00	2.4553E+00	5.6486E+05	4.4931E-03	0.000E+00	9.494E+01
1.396010E-02	1.56675E+00	2.4814E+00	5.3402E+05	5.5303E-03	0.000E+00	8.881E+01
1.492335E-02	1.76235E+00	2.5024E+00	5.0377E+05	6.7776E-03	0.000E+00	8.308E+01
1.595306E-02	1.94939E+00	2.5171E+00	4.7403E+05	8.2709E-03	0.000E+00	7.772E+01
1.705382E-02	2.12978E+00	2.5248E+00	4.4479E+05	1.0050E-02	0.000E+00	7.270E+01
1.823053E-02	2.30416E+00	2.5246E+00	4.1603E+05	1.2161E-02	0.000E+00	6.801E+01
1.948844E-02	2.47213E+00	2.5157E+00	3.8782E+05	1.4654E-02	0.000E+00	6.362E+01
2.083314E-02	2.63228E+00	2.4977E+00	3.6019E+05	1.7585E-02	0.000E+00	5.951E+01
2.227063E-02	2.78168E+00	2.4704E+00	3.3325E+05	2.1014E-02	0.000E+00	5.567E+01
2.380730E-02	2.91376E+00	2.4334E+00	3.0708E+05	2.5009E-02	0.000E+00	5.208E+01
2.545001E-02	3.00357E+00	2.3870E+00	2.8178E+05	2.9642E-02	0.000E+00	4.872E+01
2.578380E-02	3.00473E+00	2.3769E+00	2.7695E+05	3.0628E-02	0.000E+00	4.809E+01
2.617845E-02	2.96440E+00	2.3646E+00	2.7137E+05	3.1813E-02	0.000E+00	4.736E+01
2.628369E-02	2.89288E+00	2.3613E+00	2.6990E+05	3.2132E-02	0.000E+00	4.717E+01
2.644155E-02	2.97828E+00	2.5098E+00	2.8517E+05	3.2614E-02	0.000E+00	4.689E+01
2.683620E-02	3.06936E+00	2.5052E+00	2.8046E+05	3.3832E-02	0.000E+00	4.620E+01
2.720606E-02	3.11898E+00	2.5010E+00	2.7618E+05	3.4992E-02	0.000E+00	4.557E+01
2.908327E-02	3.29678E+00	2.4810E+00	2.5629E+05	4.1141E-02	0.000E+00	4.263E+01
3.109002E-02	3.45322E+00	2.4598E+00	2.3770E+05	4.8177E-02	0.000E+00	3.988E+01
3.323523E-02	3.60471E+00	2.4340E+00	2.2002E+05	5.6193E-02	0.000E+00	3.731E+01
3.552846E-02	3.75399E+00	2.4027E+00	2.0317E+05	6.5284E-02	0.000E+00	3.490E+01
3.797993E-02	3.90190E+00	2.3648E+00	1.8706E+05	7.5549E-02	0.000E+00	3.264E+01
4.060054E-02	4.04756E+00	2.3181E+00	1.7153E+05	8.7089E-02	0.000E+00	3.054E+01
4.340198E-02	4.18906E+00	2.2628E+00	1.5663E+05	1.0000E-01	0.000E+00	2.857E+01
4.639671E-02	4.32493E+00	2.1993E+00	1.4241E+05	1.1439E-01	0.000E+00	2.672E+01
4.959809E-02	4.45392E+00	2.1284E+00	1.2892E+05	1.3036E-01	0.000E+00	2.500E+01
5.302035E-02	4.57503E+00	2.0510E+00	1.1622E+05	1.4798E-01	0.000E+00	2.338E+01
5.667876E-02	4.68748E+00	1.9684E+00	1.0434E+05	1.6737E-01	0.000E+00	2.187E+01
6.058959E-02	4.79073E+00	1.8816E+00	9.3299E+04	1.8858E-01	0.000E+00	2.046E+01
6.477028E-02	4.88450E+00	1.7919E+00	8.3116E+04	2.1170E-01	0.000E+00	1.914E+01
6.923942E-02	4.96870E+00	1.7005E+00	7.3783E+04	2.3678E-01	0.000E+00	1.791E+01
7.401695E-02	5.04344E+00	1.6083E+00	6.5282E+04	2.6387E-01	0.000E+00	1.675E+01
7.912411E-02	5.10950E+00	1.5166E+00	5.7584E+04	2.9299E-01	0.000E+00	1.567E+01
8.458368E-02	5.16622E+00	1.4260E+00	5.0650E+04	3.2416E-01	0.000E+00	1.466E+01
9.041995E-02	5.21458E+00	1.3374E+00	4.4437E+04	3.5737E-01	0.000E+00	1.371E+01
9.665893E-02	5.25510E+00	1.2514E+00	3.8894E+04	3.9259E-01	0.000E+00	1.283E+01
1.033284E-01	5.28833E+00	1.1683E+00	3.3969E+04	4.2976E-01	0.000E+00	1.200E+01
1.104581E-01	5.31484E+00	1.0886E+00	2.9607E+04	4.6881E-01	0.000E+00	1.122E+01
1.180797E-01	5.33491E+00	1.0120E+00	2.5749E+04	5.0965E-01	0.000E+00	1.050E+01
1.262272E-01	5.34874E+00	9.3899E-01	2.2349E+04	5.5214E-01	0.000E+00	9.822E+00
1.349368E-01	5.35661E+00	8.6967E-01	1.9363E+04	5.9615E-01	0.000E+00	9.188E+00
1.442475E-01	5.35870E+00	8.0415E-01	1.6748E+04	6.4149E-01	0.000E+00	8.595E+00
1.542005E-01	5.35518E+00	7.4248E-01	1.4466E+04	6.8797E-01	0.000E+00	8.040E+00
1.648404E-01	5.34609E+00	6.8462E-01	1.2477E+04	7.3536E-01	0.000E+00	7.521E+00
1.762144E-01	5.33130E+00	6.2932E-01	1.0729E+04	7.8344E-01	0.000E+00	7.036E+00

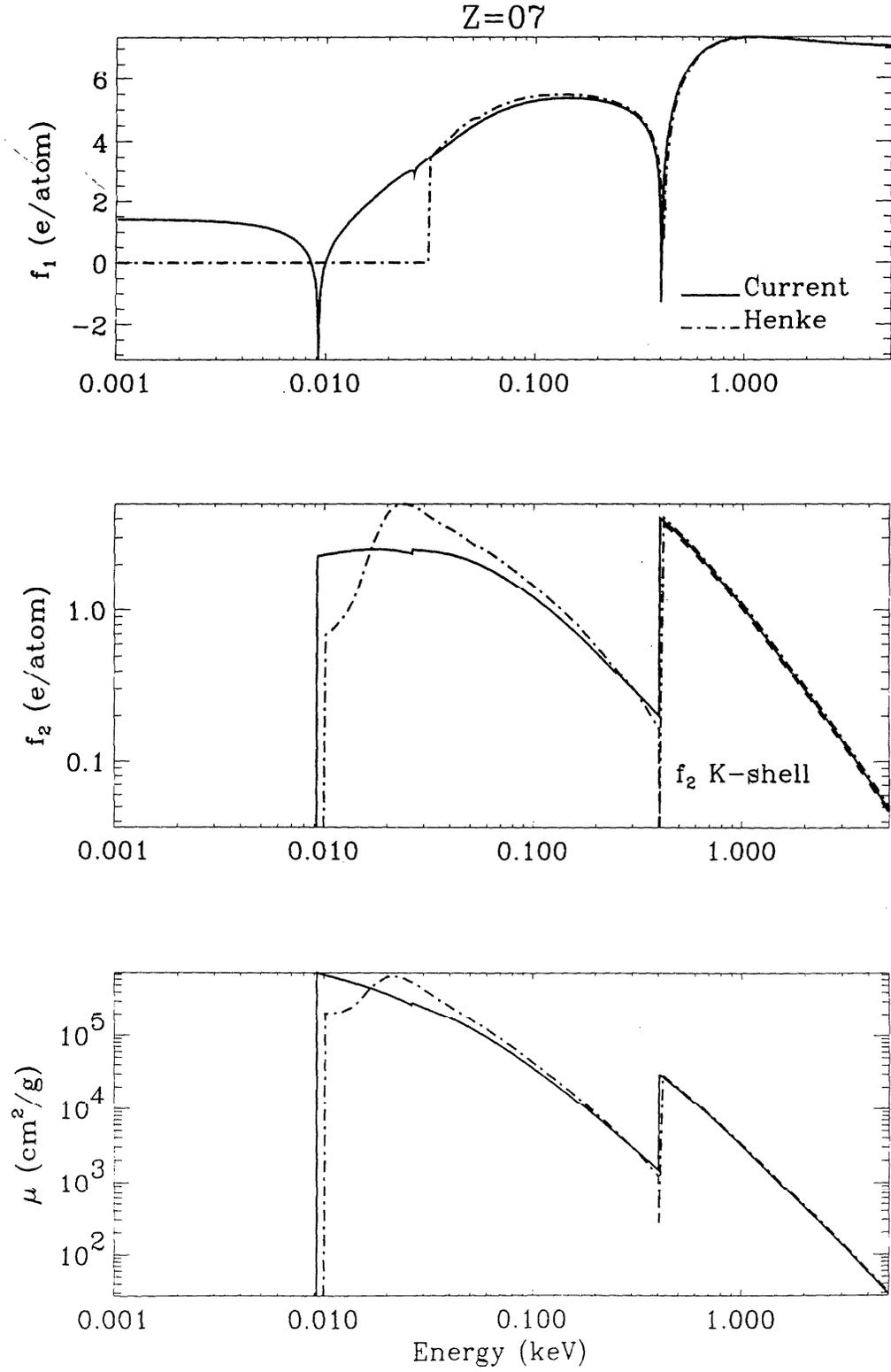
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 115

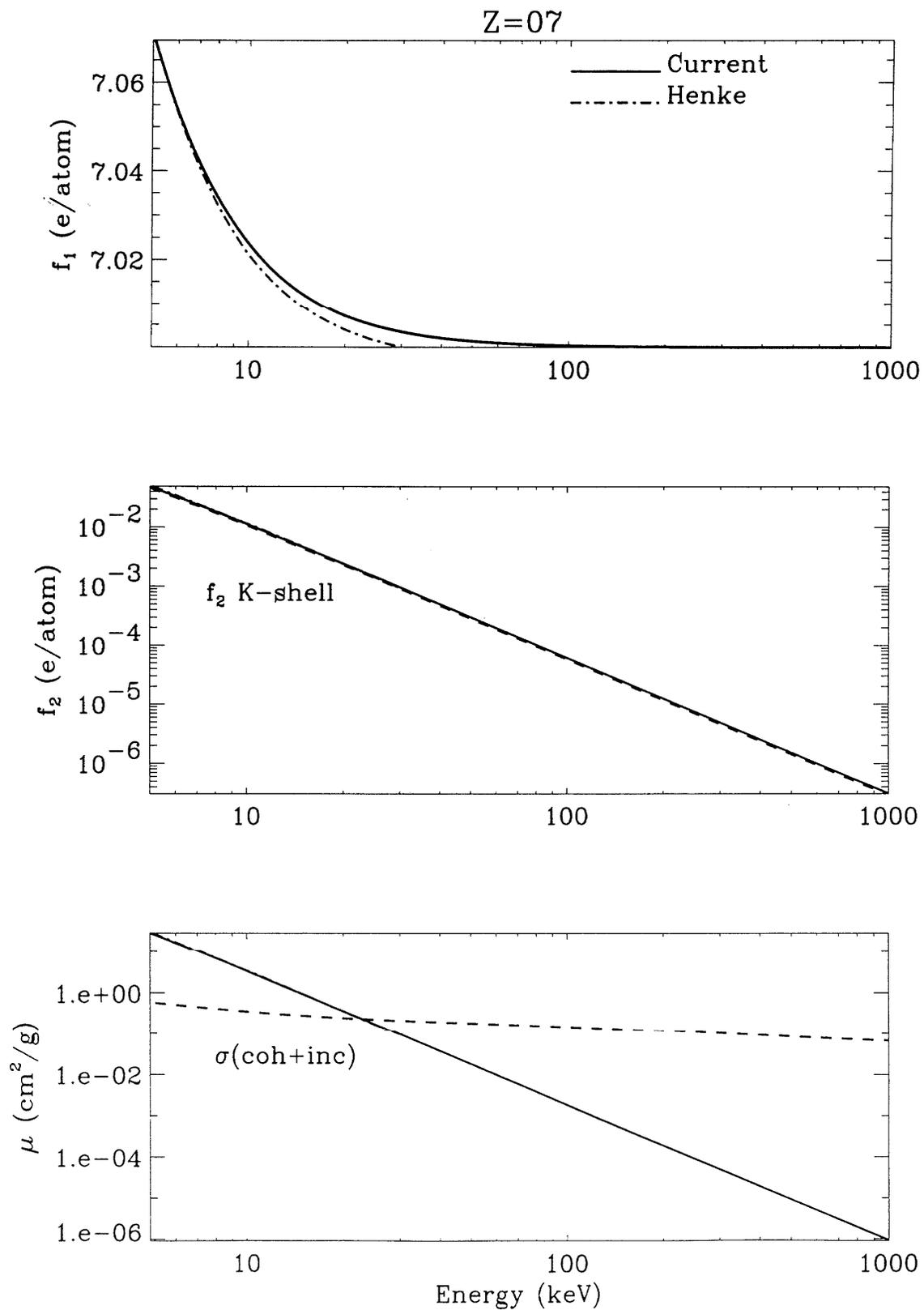
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.883732E-01	5.30915E+00	5.7532E-01	9.1756E+03	8.3194E-01	0.000E+00	6.582E+00
2.013709E-01	5.27886E+00	5.2549E-01	7.8398E+03	8.8058E-01	0.000E+00	6.157E+00
2.152655E-01	5.23972E+00	4.7959E-01	6.6933E+03	9.2907E-01	0.000E+00	5.760E+00
2.301188E-01	5.19030E+00	4.3741E-01	5.7105E+03	9.7712E-01	0.000E+00	5.388E+00
2.459970E-01	5.12826E+00	3.9869E-01	4.8691E+03	1.0244E+00	0.000E+00	5.040E+00
2.629708E-01	5.04985E+00	3.6322E-01	4.1495E+03	1.0706E+00	0.000E+00	4.715E+00
2.811158E-01	4.94898E+00	3.3075E-01	3.5347E+03	1.1155E+00	0.000E+00	4.410E+00
3.005128E-01	4.81524E+00	3.0107E-01	3.0098E+03	1.1586E+00	0.000E+00	4.126E+00
3.212482E-01	4.62915E+00	2.7396E-01	2.5621E+03	1.1998E+00	0.000E+00	3.859E+00
3.434143E-01	4.34850E+00	2.4923E-01	2.1804E+03	1.2387E+00	0.000E+00	3.610E+00
3.671099E-01	3.85352E+00	2.2669E-01	1.8551E+03	1.2751E+00	0.000E+00	3.377E+00
3.924405E-01	2.43899E+00	2.0615E-01	1.5782E+03	1.3086E+00	0.000E+00	3.159E+00
3.935680E-01	2.29017E+00	2.0531E-01	1.5673E+03	1.3100E+00	0.000E+00	3.150E+00
3.995920E-01	6.66889E-01	2.0092E-01	1.5106E+03	1.3172E+00	0.000E+00	3.103E+00
4.011984E-01	-1.27959E+00	1.9977E-01	1.4960E+03	1.3190E+00	0.000E+00	3.090E+00
4.036080E-01	7.43479E-01	4.0314E+00	3.0008E+04	1.3218E+00	2.853E+04	3.072E+00
4.096320E-01	2.51867E+00	3.9626E+00	2.9062E+04	1.3286E+00	2.764E+04	3.027E+00
4.195189E-01	3.58763E+00	3.8543E+00	2.7602E+04	1.3391E+00	2.626E+04	2.955E+00
4.484657E-01	4.91711E+00	3.5663E+00	2.3891E+04	1.3664E+00	2.275E+04	2.765E+00
4.794098E-01	5.62761E+00	3.2860E+00	2.0592E+04	1.3902E+00	1.962E+04	2.586E+00
5.124891E-01	6.10433E+00	3.0109E+00	1.7651E+04	1.4104E+00	1.683E+04	2.419E+00
5.478508E-01	6.44813E+00	2.7458E+00	1.5058E+04	1.4270E+00	1.436E+04	2.263E+00
5.856525E-01	6.70350E+00	2.4943E+00	1.2796E+04	1.4397E+00	1.221E+04	2.117E+00
6.260625E-01	6.89525E+00	2.2583E+00	1.0837E+04	1.4486E+00	1.035E+04	1.980E+00
6.692609E-01	7.03922E+00	2.0388E+00	9.1752E+03	1.4536E+00	8.739E+03	1.853E+00
7.154399E-01	7.14645E+00	1.8360E+00	7.7099E+03	1.4547E+00	7.362E+03	1.733E+00
7.648052E-01	7.22503E+00	1.6498E+00	6.4808E+03	1.4520E+00	6.189E+03	1.621E+00
8.175768E-01	7.28114E+00	1.4796E+00	5.4372E+03	1.4456E+00	5.192E+03	1.516E+00
8.739896E-01	7.31959E+00	1.3248E+00	4.5538E+03	1.4356E+00	4.348E+03	1.419E+00
9.342948E-01	7.34418E+00	1.1842E+00	3.8080E+03	1.4220E+00	3.635E+03	1.327E+00
9.987612E-01	7.35796E+00	1.0571E+00	3.1798E+03	1.4051E+00	3.035E+03	1.241E+00
1.067676E+00	7.36340E+00	9.4164E-01	2.6496E+03	1.3850E+00	2.529E+03	1.161E+00
1.141345E+00	7.36196E+00	8.3758E-01	2.2047E+03	1.3620E+00	2.105E+03	1.086E+00
1.220098E+00	7.35540E+00	7.4413E-01	1.8323E+03	1.3362E+00	1.750E+03	1.016E+00
1.304285E+00	7.34489E+00	6.6043E-01	1.5212E+03	1.3079E+00	1.453E+03	9.506E-01
1.394281E+00	7.33166E+00	5.8564E-01	1.2619E+03	1.2773E+00	1.205E+03	8.892E-01
1.490488E+00	7.31668E+00	5.1897E-01	1.0461E+03	1.2448E+00	9.992E+02	8.318E-01
1.593329E+00	7.30081E+00	4.5964E-01	8.6668E+02	1.2105E+00	8.279E+02	7.781E-01
1.703269E+00	7.28407E+00	4.0501E-01	7.1438E+02	1.1748E+00	6.822E+02	7.279E-01
1.820795E+00	7.26624E+00	3.5664E-01	5.8846E+02	1.1378E+00	5.618E+02	6.809E-01
1.946430E+00	7.24821E+00	3.1405E-01	4.8473E+02	1.0999E+00	4.626E+02	6.370E-01
2.080733E+00	7.23046E+00	2.7654E-01	3.9929E+02	1.0613E+00	3.810E+02	5.959E-01
2.224304E+00	7.21328E+00	2.4352E-01	3.2892E+02	1.0223E+00	3.137E+02	5.574E-01
2.377781E+00	7.19688E+00	2.1445E-01	2.7095E+02	9.8301E-01	2.583E+02	5.214E-01
2.541848E+00	7.18139E+00	1.8884E-01	2.2320E+02	9.4375E-01	2.127E+02	4.878E-01
2.717235E+00	7.16696E+00	1.6630E-01	1.8387E+02	9.0472E-01	1.752E+02	4.563E-01
2.904724E+00	7.15398E+00	1.4645E-01	1.5147E+02	8.6609E-01	1.443E+02	4.268E-01
3.105150E+00	7.14238E+00	1.2829E-01	1.2413E+02	8.2806E-01	1.182E+02	3.993E-01
3.319406E+00	7.13003E+00	1.1184E-01	1.0123E+02	7.9078E-01	9.638E+01	3.735E-01
3.548445E+00	7.11843E+00	9.7505E-02	8.2553E+01	7.5439E-01	7.860E+01	3.494E-01
3.793288E+00	7.10763E+00	8.5005E-02	6.7324E+01	7.1903E-01	6.410E+01	3.269E-01
4.055024E+00	7.09763E+00	7.4107E-02	5.4905E+01	6.8479E-01	5.227E+01	3.058E-01
4.334821E+00	7.08842E+00	6.4606E-02	4.4776E+01	6.5178E-01	4.263E+01	2.860E-01
4.633924E+00	7.07996E+00	5.6324E-02	3.6516E+01	6.2007E-01	3.476E+01	2.676E-01
4.953664E+00	7.07222E+00	4.9103E-02	2.9780E+01	5.8971E-01	2.835E+01	2.503E-01
5.295467E+00	7.06516E+00	4.2809E-02	2.4287E+01	5.6074E-01	2.312E+01	2.341E-01
5.660855E+00	7.05874E+00	3.7321E-02	1.9807E+01	5.3321E-01	1.885E+01	2.190E-01
6.051453E+00	7.05290E+00	3.2537E-02	1.6153E+01	5.0710E-01	1.537E+01	2.049E-01
6.469004E+00	7.04762E+00	2.8366E-02	1.3174E+01	4.8244E-01	1.254E+01	1.917E-01
6.915365E+00	7.04284E+00	2.4730E-02	1.0744E+01	4.5921E-01	1.022E+01	1.793E-01
7.392525E+00	7.03853E+00	2.1560E-02	8.7620E+00	4.3739E-01	8.338E+00	1.677E-01
7.902609E+00	7.03465E+00	1.8724E-02	7.1183E+00	4.1695E-01	6.772E+00	1.569E-01
8.447890E+00	7.03113E+00	1.6235E-02	5.7735E+00	3.9785E-01	5.490E+00	1.468E-01
9.030794E+00	7.02795E+00	1.4060E-02	4.6775E+00	3.8004E-01	4.447E+00	1.373E-01
9.653919E+00	7.02503E+00	1.2128E-02	3.7741E+00	3.6348E-01	3.587E+00	1.284E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.032004E+01	7.02238E+00	1.0461E-02	3.0452E+00	3.4811E-01	2.894E+00	1.201E-01
1.103212E+01	7.02000E+00	9.0226E-03	2.4571E+00	3.3387E-01	2.334E+00	1.124E-01
1.179334E+01	7.01785E+00	7.7825E-03	1.9825E+00	3.2069E-01	1.883E+00	1.051E-01
1.260708E+01	7.01591E+00	6.7122E-03	1.5995E+00	3.0852E-01	1.519E+00	9.834E-02
1.347697E+01	7.01418E+00	5.7889E-03	1.2905E+00	2.9729E-01	1.225E+00	9.200E-02
1.440688E+01	7.01263E+00	4.9927E-03	1.0411E+00	2.8693E-01	9.886E-01	8.606E-02
1.540095E+01	7.01123E+00	4.3060E-03	8.3998E-01	2.7738E-01	7.975E-01	8.050E-02
1.646362E+01	7.00999E+00	3.7138E-03	6.7769E-01	2.6857E-01	6.433E-01	7.531E-02
1.759961E+01	7.00888E+00	3.2030E-03	5.4676E-01	2.6045E-01	5.190E-01	7.045E-02
1.881398E+01	7.00789E+00	2.7624E-03	4.4112E-01	2.5295E-01	4.186E-01	6.590E-02
2.011215E+01	7.00701E+00	2.3825E-03	3.5589E-01	2.4601E-01	3.377E-01	6.165E-02
2.149988E+01	7.00622E+00	2.0548E-03	2.8713E-01	2.3958E-01	2.724E-01	5.767E-02
2.298338E+01	7.00552E+00	1.7722E-03	2.3166E-01	2.3361E-01	2.198E-01	5.395E-02
2.456923E+01	7.00489E+00	1.5285E-03	1.8690E-01	2.2804E-01	1.773E-01	5.046E-02
2.626450E+01	7.00435E+00	1.3183E-03	1.5079E-01	2.2284E-01	1.430E-01	4.721E-02
2.807676E+01	7.00387E+00	1.1327E-03	1.2120E-01	2.1795E-01	1.149E-01	4.416E-02
3.001405E+01	7.00343E+00	9.7197E-04	9.7291E-02	2.1334E-01	9.224E-02	4.131E-02
3.208502E+01	7.00304E+00	8.3408E-04	7.8100E-02	2.0897E-01	7.403E-02	3.864E-02
3.429889E+01	7.00269E+00	7.1576E-04	6.2695E-02	2.0481E-01	5.941E-02	3.615E-02
3.666551E+01	7.00238E+00	6.1422E-04	5.0328E-02	2.0083E-01	4.768E-02	3.381E-02
3.919543E+01	7.00210E+00	5.2709E-04	4.0401E-02	1.9700E-01	3.827E-02	3.163E-02
4.189992E+01	7.00186E+00	4.5232E-04	3.2432E-02	1.9330E-01	3.071E-02	2.959E-02
4.479101E+01	7.00164E+00	3.8815E-04	2.6035E-02	1.8971E-01	2.465E-02	2.768E-02
4.788159E+01	7.00145E+00	3.3309E-04	2.0900E-02	1.8620E-01	1.978E-02	2.589E-02
5.118542E+01	7.00128E+00	2.8584E-04	1.6777E-02	1.8277E-01	1.588E-02	2.422E-02
5.471721E+01	7.00113E+00	2.4529E-04	1.3468E-02	1.7940E-01	1.274E-02	2.266E-02
5.849270E+01	7.00100E+00	2.1050E-04	1.0812E-02	1.7608E-01	1.023E-02	2.120E-02
6.252870E+01	7.00088E+00	1.8064E-04	8.6790E-03	1.7280E-01	8.208E-03	1.983E-02
6.684318E+01	7.00078E+00	1.5501E-04	6.9672E-03	1.6955E-01	6.587E-03	1.855E-02
7.145536E+01	7.00068E+00	1.3303E-04	5.5930E-03	1.6633E-01	5.287E-03	1.735E-02
7.638578E+01	7.00060E+00	1.1416E-04	4.4898E-03	1.6313E-01	4.243E-03	1.623E-02
8.165640E+01	7.00053E+00	9.7951E-05	3.6038E-03	1.5995E-01	3.405E-03	1.518E-02
8.729069E+01	7.00047E+00	8.4023E-05	2.8918E-03	1.5678E-01	2.732E-03	1.420E-02
9.331374E+01	7.00041E+00	7.2075E-05	2.3205E-03	1.5363E-01	2.191E-03	1.329E-02
9.975239E+01	7.00036E+00	6.1826E-05	1.8621E-03	1.5049E-01	1.758E-03	1.243E-02
1.066353E+02	7.00032E+00	5.3035E-05	1.4942E-03	1.4737E-01	1.410E-03	1.163E-02
1.139931E+02	7.00028E+00	4.5494E-05	1.1990E-03	1.4427E-01	1.131E-03	1.088E-02
1.218587E+02	7.00025E+00	3.9025E-05	9.6212E-04	1.4119E-01	9.076E-04	1.017E-02
1.302669E+02	7.00022E+00	3.3476E-05	7.7205E-04	1.3813E-01	7.281E-04	9.518E-03
1.392553E+02	7.00019E+00	2.8716E-05	6.1953E-04	1.3509E-01	5.841E-04	8.903E-03
1.488640E+02	7.00017E+00	2.4633E-05	4.9713E-04	1.3208E-01	4.686E-04	8.329E-03
1.591356E+02	7.00015E+00	2.1131E-05	3.9892E-04	1.2909E-01	3.759E-04	7.791E-03
1.701159E+02	7.00013E+00	1.8126E-05	3.2011E-04	1.2614E-01	3.016E-04	7.288E-03
1.818539E+02	7.00012E+00	1.5549E-05	2.5688E-04	1.2323E-01	2.419E-04	6.818E-03
1.944018E+02	7.00010E+00	1.3338E-05	2.0613E-04	1.2035E-01	1.941E-04	6.378E-03
2.078156E+02	7.00009E+00	1.1442E-05	1.6541E-04	1.1751E-01	1.557E-04	5.966E-03
2.221548E+02	7.00008E+00	9.8150E-06	1.3273E-04	1.1472E-01	1.249E-04	5.581E-03
2.374835E+02	7.00007E+00	8.4195E-06	1.0651E-04	1.1197E-01	1.002E-04	5.221E-03
2.538699E+02	7.00006E+00	7.2224E-06	8.5470E-05	1.0927E-01	8.038E-05	4.884E-03
2.713869E+02	7.00005E+00	6.1956E-06	6.8586E-05	1.0662E-01	6.448E-05	4.569E-03
2.901126E+02	7.00005E+00	5.3147E-06	5.5037E-05	1.0402E-01	5.173E-05	4.274E-03
3.101304E+02	7.00004E+00	4.5591E-06	4.4165E-05	1.0148E-01	4.150E-05	3.998E-03
3.315294E+02	7.00004E+00	3.9109E-06	3.5441E-05	9.9001E-02	3.329E-05	3.740E-03
3.544049E+02	7.00003E+00	3.3549E-06	2.8440E-05	9.6577E-02	2.671E-05	3.498E-03
3.788588E+02	7.00003E+00	2.8779E-06	2.2822E-05	9.4213E-02	2.143E-05	3.273E-03
4.050001E+02	7.00002E+00	2.4688E-06	1.8313E-05	9.1911E-02	1.719E-05	3.061E-03
4.329451E+02	7.00002E+00	2.1178E-06	1.4696E-05	8.9671E-02	1.379E-05	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 119

0 Z = 8

Atomic weight = 1.599940E+01 g/mol, nominal density ρ (g/cm³) = 1.3310E-03

μ_{κ} (barns/atom) = μ (cm²/g) \times 2.65676E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.63012E+06

4 edges. Edge energies (keV):

K 5.3200E-01 L I 2.3700E-02 L II 7.1000E-03 L III 7.1000E-03
 Relativistic correction estimate f_{rel} (H82,3/5CL) = -7.7133E-03, -4.2000E-03 e/atom
 Nuclear Thomson correction f_{NT} = -2.1944E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{κ} cm ² /g	λ nm
6.95800E-03	-2.20730E+00	0.0000E+00	0.0000E+00	2.2483E-04	0.000E+00	1.782E+02
7.06450E-03	-3.19554E+00	0.0000E+00	0.0000E+00	2.3940E-04	0.000E+00	1.755E+02
7.09290E-03	-4.32288E+00	0.0000E+00	0.0000E+00	2.4339E-04	0.000E+00	1.748E+02
7.13550E-03	-3.22458E+00	2.1888E+00	8.0680E+05	2.4946E-04	0.000E+00	1.738E+02
7.24200E-03	-2.28890E+00	2.2193E+00	8.0601E+05	2.6511E-04	0.000E+00	1.712E+02
1.06900E-02	2.11490E-01	2.8635E+00	7.0453E+05	1.2029E-03	0.000E+00	1.160E+02
1.142761E-02	4.32528E-01	2.9247E+00	6.7313E+05	1.5334E-03	0.000E+00	1.085E+02
1.221612E-02	6.41679E-01	2.9771E+00	6.4097E+05	1.9453E-03	0.000E+00	1.015E+02
1.305903E-02	8.41330E-01	3.0227E+00	6.0878E+05	2.4564E-03	0.000E+00	9.494E+01
1.396010E-02	1.03339E+00	3.0629E+00	5.7706E+05	3.0872E-03	0.000E+00	8.881E+01
1.492335E-02	1.21943E+00	3.0988E+00	5.4613E+05	3.8621E-03	0.000E+00	8.308E+01
1.595306E-02	1.40070E+00	3.1309E+00	5.1617E+05	4.8093E-03	0.000E+00	7.772E+01
1.705382E-02	1.57805E+00	3.1595E+00	4.8727E+05	5.9613E-03	0.000E+00	7.270E+01
1.823053E-02	1.75182E+00	3.1845E+00	4.5943E+05	7.3557E-03	0.000E+00	6.801E+01
1.948844E-02	1.92140E+00	3.2056E+00	4.3262E+05	9.0354E-03	0.000E+00	6.362E+01
2.083314E-02	2.08430E+00	3.2222E+00	4.0679E+05	1.1049E-02	0.000E+00	5.951E+01
2.227063E-02	2.23222E+00	3.2335E+00	3.8187E+05	1.3451E-02	0.000E+00	5.567E+01
2.322600E-02	2.29401E+00	3.2375E+00	3.6662E+05	1.5189E-02	0.000E+00	5.338E+01
2.358150E-02	2.27485E+00	3.2384E+00	3.6119E+05	1.5865E-02	0.000E+00	5.258E+01
2.367630E-02	2.21999E+00	3.2385E+00	3.5976E+05	1.6048E-02	0.000E+00	5.237E+01
2.380730E-02	2.29056E+00	3.3643E+00	3.7167E+05	1.6302E-02	0.000E+00	5.208E+01
2.381850E-02	2.29549E+00	3.3645E+00	3.7152E+05	1.6324E-02	0.000E+00	5.205E+01
2.417400E-02	2.38419E+00	3.3716E+00	3.6683E+05	1.7026E-02	0.000E+00	5.129E+01
2.545001E-02	2.56373E+00	3.3962E+00	3.5098E+05	1.9671E-02	0.000E+00	4.872E+01
2.720606E-02	2.77017E+00	3.4281E+00	3.3141E+05	2.3633E-02	0.000E+00	4.557E+01
2.908327E-02	2.97896E+00	3.4550E+00	3.1245E+05	2.8270E-02	0.000E+00	4.263E+01
3.109002E-02	3.19372E+00	3.4718E+00	2.9370E+05	3.3671E-02	0.000E+00	3.988E+01
3.323523E-02	3.41313E+00	3.4762E+00	2.7509E+05	3.9932E-02	0.000E+00	3.731E+01
3.552846E-02	3.63537E+00	3.4671E+00	2.5667E+05	4.7156E-02	0.000E+00	3.490E+01
3.797993E-02	3.85841E+00	3.4438E+00	2.3849E+05	5.5453E-02	0.000E+00	3.264E+01
4.060054E-02	4.08006E+00	3.4059E+00	2.2064E+05	6.4936E-02	0.000E+00	3.054E+01
4.340198E-02	4.29812E+00	3.3536E+00	2.0322E+05	7.5725E-02	0.000E+00	2.857E+01
4.639671E-02	4.51045E+00	3.2873E+00	1.8635E+05	8.7941E-02	0.000E+00	2.672E+01
4.959809E-02	4.71509E+00	3.2080E+00	1.7012E+05	1.0171E-01	0.000E+00	2.500E+01
5.302035E-02	4.91032E+00	3.1170E+00	1.5462E+05	1.1716E-01	0.000E+00	2.338E+01
5.667876E-02	5.09473E+00	3.0157E+00	1.3994E+05	1.3440E-01	0.000E+00	2.187E+01
6.058959E-02	5.26727E+00	2.9059E+00	1.2614E+05	1.5357E-01	0.000E+00	2.046E+01
6.477028E-02	5.42719E+00	2.7892E+00	1.1326E+05	1.7477E-01	0.000E+00	1.914E+01
6.923942E-02	5.57410E+00	2.6674E+00	1.0132E+05	1.9812E-01	0.000E+00	1.791E+01
7.401695E-02	5.70887E+00	2.5423E+00	9.0338E+04	2.2370E-01	0.000E+00	1.675E+01
7.912411E-02	5.82981E+00	2.4154E+00	8.0288E+04	2.5160E-01	0.000E+00	1.567E+01
8.458368E-02	5.93830E+00	2.2881E+00	7.1150E+04	2.8189E-01	0.000E+00	1.466E+01
9.041995E-02	6.03498E+00	2.1619E+00	6.2884E+04	3.1462E-01	0.000E+00	1.371E+01
9.665893E-02	6.12073E+00	2.0376E+00	5.5445E+04	3.4981E-01	0.000E+00	1.283E+01
1.033284E-01	6.19637E+00	1.9159E+00	4.8768E+04	3.8747E-01	0.000E+00	1.200E+01
1.104581E-01	6.26258E+00	1.7974E+00	4.2799E+04	4.2758E-01	0.000E+00	1.122E+01
1.180797E-01	6.32029E+00	1.6829E+00	3.7485E+04	4.7009E-01	0.000E+00	1.050E+01
1.262272E-01	6.37066E+00	1.5728E+00	3.2772E+04	5.1493E-01	0.000E+00	9.822E+00
1.349368E-01	6.41516E+00	1.4636E+00	2.8527E+04	5.6198E-01	0.000E+00	9.188E+00
1.442475E-01	6.44826E+00	1.3430E+00	2.4487E+04	6.1111E-01	0.000E+00	8.595E+00
1.542005E-01	6.46854E+00	1.2306E+00	2.0989E+04	6.6214E-01	0.000E+00	8.040E+00
1.648404E-01	6.47860E+00	1.1262E+00	1.7970E+04	7.1488E-01	0.000E+00	7.521E+00
1.762144E-01	6.48016E+00	1.0297E+00	1.5369E+04	7.6910E-01	0.000E+00	7.036E+00
1.883732E-01	6.47437E+00	9.4068E-01	1.3134E+04	8.2453E-01	0.000E+00	6.582E+00

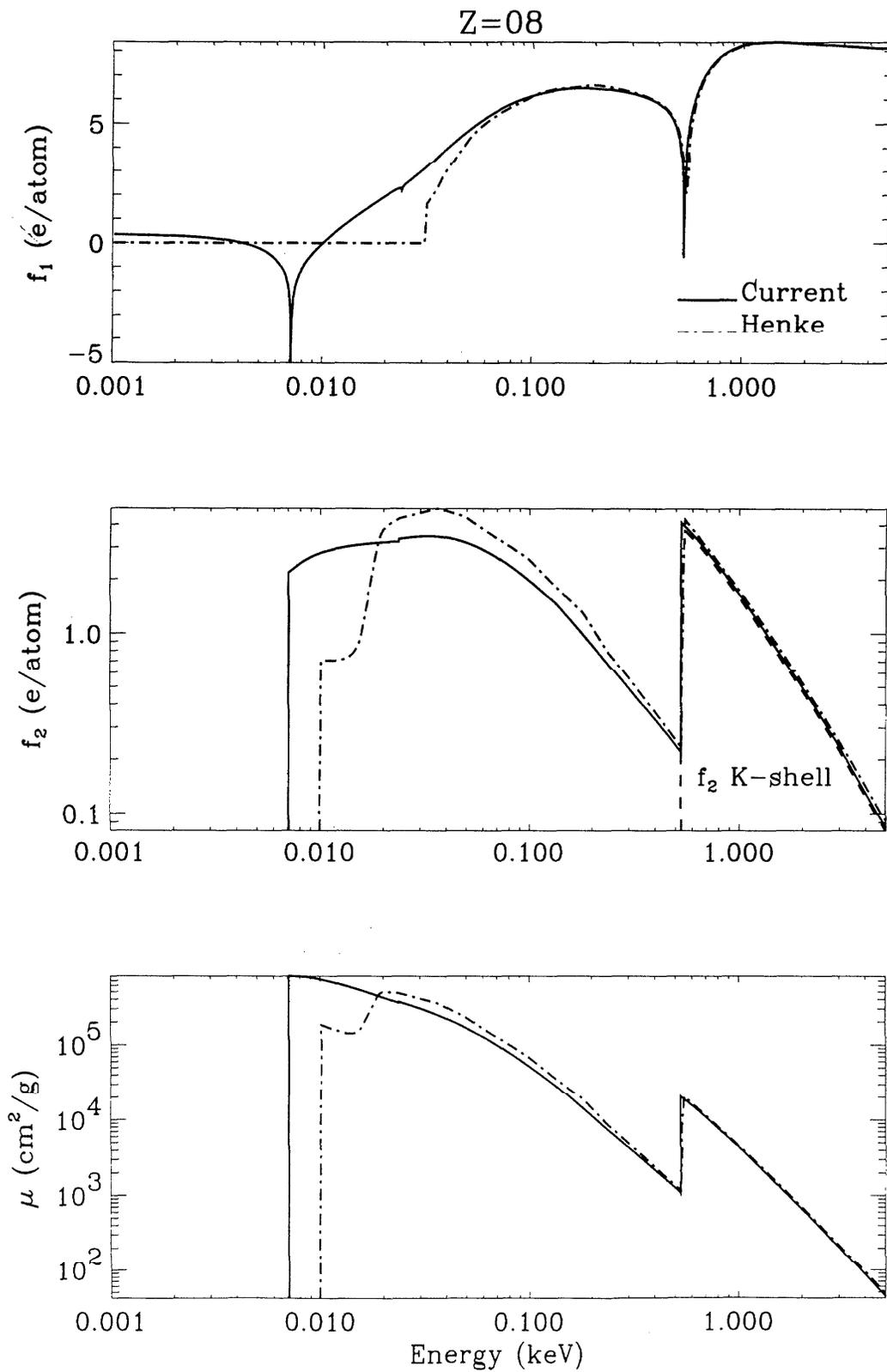
TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.013709E-01	6.46203E+00	8.5876E-01	1.1216E+04	8.8088E-01	0.000E+00	6.157E+00
2.152655E-01	6.44358E+00	7.8355E-01	9.5735E+03	9.3785E-01	0.000E+00	5.760E+00
2.301188E-01	6.41919E+00	7.1464E-01	8.1679E+03	9.9509E-01	0.000E+00	5.388E+00
2.459970E-01	6.38871E+00	6.5159E-01	6.9666E+03	1.0523E+00	0.000E+00	5.040E+00
2.629708E-01	6.35166E+00	5.9399E-01	5.9408E+03	1.1090E+00	0.000E+00	4.715E+00
2.811158E-01	6.30713E+00	5.4143E-01	5.0656E+03	1.1649E+00	0.000E+00	4.410E+00
3.005128E-01	6.25366E+00	4.9351E-01	4.3192E+03	1.2196E+00	0.000E+00	4.126E+00
3.212482E-01	6.18896E+00	4.4986E-01	3.6831E+03	1.2727E+00	0.000E+00	3.859E+00
3.434143E-01	6.10952E+00	4.1012E-01	3.1410E+03	1.3238E+00	0.000E+00	3.610E+00
3.671099E-01	6.00975E+00	3.7397E-01	2.6793E+03	1.3725E+00	0.000E+00	3.377E+00
3.924405E-01	5.88028E+00	3.4110E-01	2.2860E+03	1.4186E+00	0.000E+00	3.159E+00
4.195189E-01	5.70405E+00	3.1121E-01	1.9511E+03	1.4616E+00	0.000E+00	2.955E+00
4.484657E-01	5.44549E+00	2.8376E-01	1.6641E+03	1.5012E+00	0.000E+00	2.765E+00
4.794098E-01	5.01012E+00	2.5661E-01	1.4078E+03	1.5372E+00	0.000E+00	2.586E+00
5.124891E-01	3.97074E+00	2.3191E-01	1.1902E+03	1.5692E+00	0.000E+00	2.419E+00
5.213600E-01	3.28506E+00	2.2593E-01	1.1397E+03	1.5768E+00	0.000E+00	2.378E+00
5.293400E-01	1.63837E+00	2.2075E-01	1.0969E+03	1.5833E+00	0.000E+00	2.342E+00
5.314680E-01	-3.36417E-01	2.1941E-01	1.0858E+03	1.5849E+00	0.000E+00	2.333E+00
5.346600E-01	1.71635E+00	4.1067E+00	2.0202E+04	1.5874E+00	1.913E+04	2.319E+00
5.426400E-01	3.51780E+00	4.0360E+00	1.9562E+04	1.5934E+00	1.853E+04	2.285E+00
5.478508E-01	4.05204E+00	3.9911E+00	1.9160E+04	1.5971E+00	1.815E+04	2.263E+00
5.856525E-01	5.74654E+00	3.6911E+00	1.6577E+04	1.6206E+00	1.573E+04	2.117E+00
6.260625E-01	6.55266E+00	3.3971E+00	1.4271E+04	1.6397E+00	1.355E+04	1.980E+00
6.692609E-01	7.07480E+00	3.1024E+00	1.2192E+04	1.6542E+00	1.159E+04	1.853E+00
7.154399E-01	7.44087E+00	2.8186E+00	1.0362E+04	1.6640E+00	9.852E+03	1.733E+00
7.648052E-01	7.70602E+00	2.5523E+00	8.7773E+03	1.6691E+00	8.348E+03	1.621E+00
8.175768E-01	7.90150E+00	2.3068E+00	7.4209E+03	1.6695E+00	7.059E+03	1.516E+00
8.739896E-01	8.04830E+00	2.0831E+00	6.2688E+03	1.6654E+00	5.964E+03	1.419E+00
9.342948E-01	8.16115E+00	1.8753E+00	5.2791E+03	1.6567E+00	5.022E+03	1.327E+00
9.987612E-01	8.24254E+00	1.6834E+00	4.4331E+03	1.6436E+00	4.216E+03	1.241E+00
1.067676E+00	8.30267E+00	1.5016E+00	3.6990E+03	1.6264E+00	3.520E+03	1.161E+00
1.141345E+00	8.33861E+00	1.3385E+00	3.0845E+03	1.6051E+00	2.936E+03	1.086E+00
1.220098E+00	8.35935E+00	1.1926E+00	2.5708E+03	1.5801E+00	2.447E+03	1.016E+00
1.304285E+00	8.36902E+00	1.0621E+00	2.1417E+03	1.5516E+00	2.039E+03	9.506E-01
1.394281E+00	8.37050E+00	9.4552E-01	1.7836E+03	1.5199E+00	1.699E+03	8.892E-01
1.490486E+00	8.36596E+00	8.4147E-01	1.4849E+03	1.4852E+00	1.414E+03	8.318E-01
1.593329E+00	8.35705E+00	7.4865E-01	1.2358E+03	1.4479E+00	1.177E+03	7.781E-01
1.703269E+00	8.34392E+00	6.6590E-01	1.0283E+03	1.4083E+00	9.796E+02	7.279E-01
1.820795E+00	8.33198E+00	5.9217E-01	8.5538E+02	1.3667E+00	8.150E+02	6.809E-01
1.946430E+00	8.31689E+00	5.2651E-01	7.1145E+02	1.3235E+00	6.779E+02	6.370E-01
2.080733E+00	8.30145E+00	4.6808E-01	5.9167E+02	1.2790E+00	5.637E+02	5.959E-01
2.224304E+00	8.28581E+00	4.1395E-01	4.8948E+02	1.2334E+00	4.662E+02	5.574E-01
2.377781E+00	8.26885E+00	3.6513E-01	4.0388E+02	1.1872E+00	3.845E+02	5.214E-01
2.541848E+00	8.25152E+00	3.2207E-01	3.3325E+02	1.1406E+00	3.172E+02	4.878E-01
2.717235E+00	8.23442E+00	2.8409E-01	2.7498E+02	1.0938E+00	2.616E+02	4.563E-01
2.904724E+00	8.21791E+00	2.5059E-01	2.2690E+02	1.0472E+00	2.157E+02	4.268E-01
3.105150E+00	8.20256E+00	2.1994E-01	1.8630E+02	1.0011E+00	1.771E+02	3.993E-01
3.319406E+00	8.18728E+00	1.9213E-01	1.5224E+02	9.5552E-01	1.447E+02	3.735E-01
3.548445E+00	8.17222E+00	1.6784E-01	1.2440E+02	9.1083E-01	1.182E+02	3.494E-01
3.793288E+00	8.15779E+00	1.4662E-01	1.0166E+02	8.6716E-01	9.662E+01	3.269E-01
4.055024E+00	8.14414E+00	1.2808E-01	8.3077E+01	8.2468E-01	7.896E+01	3.058E-01
4.334821E+00	8.13136E+00	1.1189E-01	6.7890E+01	7.8354E-01	6.452E+01	2.860E-01
4.633924E+00	8.11947E+00	9.7749E-02	5.5480E+01	7.4386E-01	5.272E+01	2.676E-01
4.953664E+00	8.10847E+00	8.5394E-02	4.5339E+01	7.0572E-01	4.308E+01	2.503E-01
5.295467E+00	8.09834E+00	7.4601E-02	3.7052E+01	6.6922E-01	3.520E+01	2.341E-01
5.660855E+00	8.08903E+00	6.5172E-02	3.0280E+01	6.3440E-01	2.877E+01	2.190E-01
6.051453E+00	8.08051E+00	5.6936E-02	2.4746E+01	6.0130E-01	2.351E+01	2.049E-01
6.469004E+00	8.07273E+00	4.9740E-02	2.0223E+01	5.6995E-01	1.921E+01	1.917E-01
6.915365E+00	8.06564E+00	4.3455E-02	1.6527E+01	5.4035E-01	1.570E+01	1.793E-01
7.392525E+00	8.05920E+00	3.7964E-02	1.3507E+01	5.1248E-01	1.283E+01	1.677E-01
7.902609E+00	8.05336E+00	3.3166E-02	1.1038E+01	4.8633E-01	1.048E+01	1.569E-01
8.447890E+00	8.04808E+00	2.8976E-02	9.0211E+00	4.6186E-01	8.564E+00	1.468E-01
9.030794E+00	8.04333E+00	2.5277E-02	7.3617E+00	4.3901E-01	6.988E+00	1.373E-01
9.653919E+00	8.03905E+00	2.1935E-02	5.9760E+00	4.1774E-01	5.672E+00	1.284E-01
1.032004E+01	8.03513E+00	1.8995E-02	4.8409E+00	3.9798E-01	4.594E+00	1.201E-01

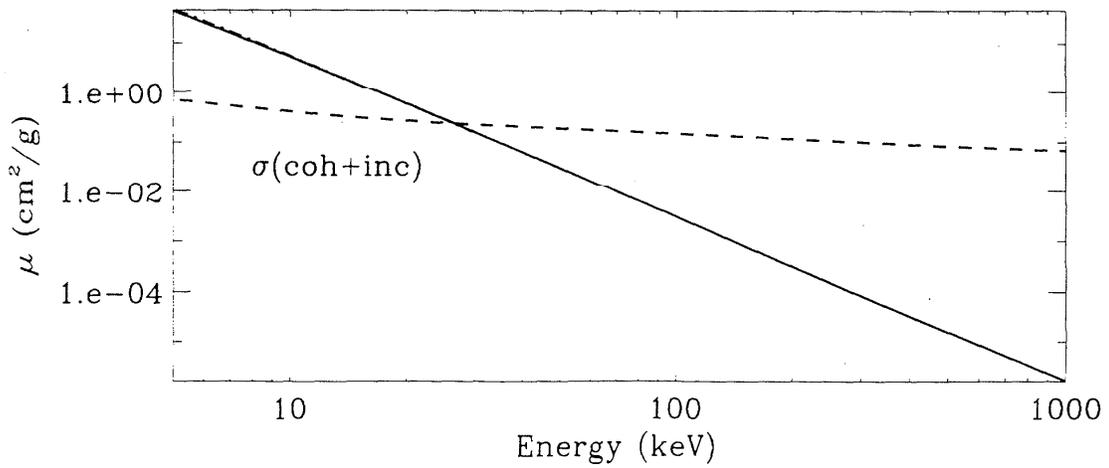
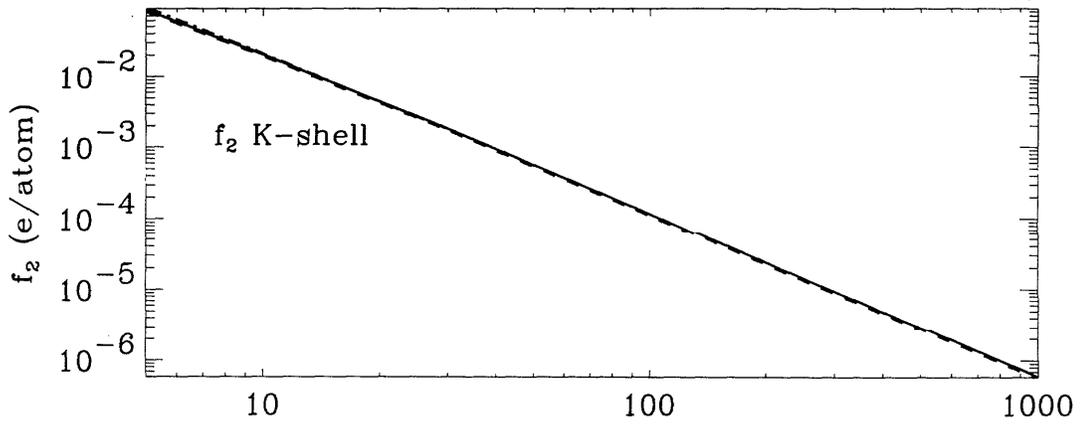
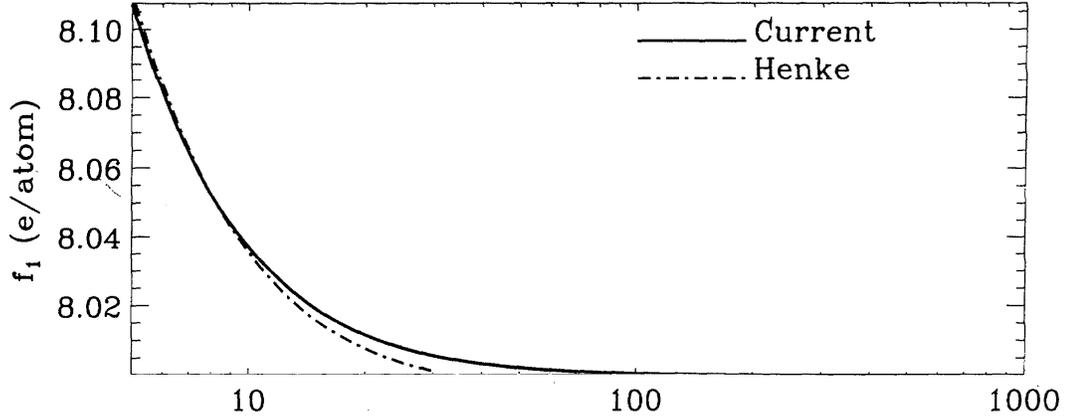
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 121

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.103212E+01	8.03154E+00	1.6411E-02	3.9125E+00	3.7966E-01	3.712E+00	1.124E-01
1.179334E+01	8.02827E+00	1.4177E-02	3.1618E+00	3.6271E-01	2.999E+00	1.051E-01
1.260708E+01	8.02530E+00	1.2248E-02	2.5551E+00	3.4705E-01	2.424E+00	9.834E-02
1.347697E+01	8.02262E+00	1.0581E-02	2.0649E+00	3.3260E-01	1.958E+00	9.200E-02
1.440688E+01	8.02021E+00	9.1406E-03	1.6687E+00	3.1928E-01	1.582E+00	8.606E-02
1.540095E+01	8.01804E+00	7.8965E-03	1.3485E+00	3.0702E-01	1.279E+00	8.050E-02
1.646362E+01	8.01609E+00	6.8218E-03	1.0898E+00	2.9572E-01	1.033E+00	7.531E-02
1.759961E+01	8.01434E+00	5.8934E-03	8.8072E-01	2.8532E-01	8.348E-01	7.045E-02
1.881398E+01	8.01277E+00	5.0913E-03	7.1175E-01	2.7573E-01	6.746E-01	6.590E-02
2.011215E+01	8.01137E+00	4.3984E-03	5.7519E-01	2.6688E-01	5.451E-01	6.165E-02
2.149988E+01	8.01012E+00	3.7998E-03	4.6484E-01	2.5871E-01	4.404E-01	5.767E-02
2.298338E+01	8.00900E+00	3.2827E-03	3.7566E-01	2.5114E-01	3.559E-01	5.395E-02
2.456923E+01	8.00801E+00	2.8360E-03	3.0359E-01	2.4411E-01	2.876E-01	5.046E-02
2.626450E+01	8.00713E+00	2.4500E-03	2.4535E-01	2.3756E-01	2.324E-01	4.721E-02
2.807676E+01	8.00633E+00	2.1079E-03	1.9746E-01	2.3144E-01	1.870E-01	4.416E-02
3.001405E+01	8.00562E+00	1.8110E-03	1.5870E-01	2.2570E-01	1.502E-01	4.131E-02
3.208502E+01	8.00498E+00	1.5560E-03	1.2755E-01	2.2028E-01	1.207E-01	3.864E-02
3.429889E+01	8.00442E+00	1.3368E-03	1.0251E-01	2.1516E-01	9.701E-02	3.615E-02
3.666551E+01	8.00392E+00	1.1486E-03	8.2390E-02	2.1028E-01	7.795E-02	3.381E-02
3.919543E+01	8.00347E+00	9.8682E-04	6.6219E-02	2.0563E-01	6.264E-02	3.163E-02
4.189922E+01	8.00307E+00	8.4786E-04	5.3221E-02	2.0115E-01	5.033E-02	2.959E-02
4.479101E+01	8.00272E+00	7.2846E-04	4.2775E-02	1.9684E-01	4.044E-02	2.768E-02
4.788159E+01	8.00240E+00	6.2588E-04	3.4379E-02	1.9266E-01	3.250E-02	2.589E-02
5.118542E+01	8.00213E+00	5.3774E-04	2.7631E-02	1.8859E-01	2.611E-02	2.422E-02
5.471721E+01	8.00188E+00	4.6201E-04	2.2208E-02	1.8462E-01	2.098E-02	2.266E-02
5.849270E+01	8.00166E+00	3.9695E-04	1.7849E-02	1.8074E-01	1.686E-02	2.120E-02
6.252870E+01	8.00147E+00	3.4106E-04	1.4346E-02	1.7693E-01	1.355E-02	1.983E-02
6.684318E+01	8.00130E+00	2.9303E-04	1.1530E-02	1.7318E-01	1.089E-02	1.855E-02
7.145536E+01	8.00114E+00	2.5177E-04	9.2670E-03	1.6948E-01	8.749E-03	1.735E-02
7.638578E+01	8.00101E+00	2.1632E-04	7.4482E-03	1.6583E-01	7.030E-03	1.623E-02
8.165640E+01	8.00089E+00	1.8580E-04	5.9845E-03	1.6223E-01	5.647E-03	1.518E-02
8.729069E+01	8.00079E+00	1.5948E-04	4.8053E-03	1.5867E-01	4.533E-03	1.420E-02
9.331374E+01	8.00069E+00	1.3689E-04	3.8584E-03	1.5514E-01	3.639E-03	1.329E-02
9.975239E+01	8.00061E+00	1.1750E-04	3.0981E-03	1.5166E-01	2.921E-03	1.243E-02
1.066353E+02	8.00054E+00	1.0086E-04	2.4876E-03	1.4821E-01	2.345E-03	1.163E-02
1.139931E+02	8.00048E+00	8.6571E-05	1.9974E-03	1.4481E-01	1.882E-03	1.088E-02
1.218587E+02	8.00042E+00	7.4309E-05	1.6038E-03	1.4144E-01	1.511E-03	1.017E-02
1.302669E+02	8.00037E+00	6.3783E-05	1.2878E-03	1.3812E-01	1.213E-03	9.518E-03
1.392553E+02	8.00033E+00	5.4749E-05	1.0340E-03	1.3485E-01	9.735E-04	8.903E-03
1.488640E+02	8.00029E+00	4.6994E-05	8.3029E-04	1.3162E-01	7.814E-04	8.329E-03
1.591356E+02	8.00025E+00	4.0338E-05	6.6669E-04	1.2845E-01	6.273E-04	7.791E-03
1.701159E+02	8.00022E+00	3.4625E-05	5.3533E-04	1.2532E-01	5.035E-04	7.288E-03
1.818539E+02	8.00020E+00	2.9721E-05	4.2985E-04	1.2226E-01	4.042E-04	6.818E-03
1.944018E+02	8.00017E+00	2.5511E-05	3.4515E-04	1.1925E-01	3.244E-04	6.378E-03
2.078156E+02	8.00015E+00	2.1898E-05	2.7714E-04	1.1631E-01	2.604E-04	5.966E-03
2.221548E+02	8.00013E+00	1.8797E-05	2.2254E-04	1.1343E-01	2.091E-04	5.581E-03
2.374835E+02	8.00012E+00	1.6135E-05	1.7869E-04	1.1062E-01	1.678E-04	5.221E-03
2.538699E+02	8.00010E+00	1.3849E-05	1.4348E-04	1.0787E-01	1.347E-04	4.884E-03
2.713869E+02	8.00009E+00	1.1888E-05	1.1521E-04	1.0520E-01	1.081E-04	4.569E-03
2.901126E+02	8.00008E+00	1.0204E-05	9.2511E-05	1.0260E-01	8.680E-05	4.274E-03
3.101304E+02	8.00007E+00	8.7592E-06	7.4284E-05	1.0007E-01	6.967E-05	3.998E-03
3.315294E+02	8.00006E+00	7.5187E-06	5.9648E-05	9.7623E-02	5.593E-05	3.740E-03
3.544049E+02	8.00005E+00	6.4539E-06	4.7896E-05	9.5249E-02	4.490E-05	3.498E-03
3.788588E+02	8.00005E+00	5.5399E-06	3.8459E-05	9.2954E-02	3.604E-05	3.273E-03
4.050001E+02	8.00004E+00	4.7554E-06	3.0882E-05	9.0737E-02	2.893E-05	3.061E-03
4.329451E+02	8.00004E+00	4.0819E-06	2.4798E-05	8.8600E-02	2.322E-05	2.864E-03



Z=08



F Z = 9

Atomic weight = 1.899840E+01 g/mol, nominal density ρ (g/cm³) = 1.1080E+00 μ_a (barns/atom) = μ (cm²/g) \times 3.15476E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.21494E+06

4 edges. Edge energies (keV):

K 6.85400E-00 L I 3.10000E-02 L II 8.60000E-03 L III 8.60000E-03

Relativistic correction estimate f_{rel} (H82.3/5CL) = -9.9395E-03, -5.4000E-03 e/atomNuclear Thomson correction f_{NT} = -2.3389E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
8.428000E-03	-2.53843E+00	0.0000E+00	0.0000E+00	1.5103E-04	0.000E+00	1.471E+02
8.557000E-03	-3.50839E+00	0.0000E+00	0.0000E+00	1.6145E-04	0.000E+00	1.449E+02
8.591400E-03	-4.60765E+00	0.0000E+00	0.0000E+00	1.6431E-04	0.000E+00	1.443E+02
8.643000E-03	-3.54459E+00	2.1300E+00	5.4585E+05	1.6867E-04	0.000E+00	1.435E+02
8.772000E-03	-2.64402E+00	2.1646E+00	5.4656E+05	1.7994E-04	0.000E+00	1.413E+02
1.069000E-02	-1.03438E+00	2.6472E+00	5.4849E+05	4.1580E-04	0.000E+00	1.160E+02
1.142761E-02	-7.85561E-01	2.7969E+00	5.4210E+05	5.4590E-04	0.000E+00	1.085E+02
1.221612E-02	-5.55727E-01	2.9380E+00	5.3270E+05	7.1297E-04	0.000E+00	1.015E+02
1.305903E-02	-3.35163E-01	3.0710E+00	5.2087E+05	9.2639E-04	0.000E+00	9.494E+01
1.396010E-02	-1.18924E-01	3.1962E+00	5.0711E+05	1.1975E-03	0.000E+00	8.881E+01
1.492335E-02	9.58117E-02	3.3139E+00	4.9186E+05	1.5401E-03	0.000E+00	8.308E+01
1.595306E-02	3.10798E-01	3.4245E+00	4.7546E+05	1.9707E-03	0.000E+00	7.772E+01
1.705382E-02	5.27186E-01	3.5280E+00	4.5822E+05	2.5091E-03	0.000E+00	7.270E+01
1.823053E-02	7.45735E-01	3.6244E+00	4.4035E+05	3.1786E-03	0.000E+00	6.801E+01
1.948844E-02	9.66891E-01	3.7134E+00	4.2205E+05	4.0067E-03	0.000E+00	6.362E+01
2.083314E-02	1.19079E+00	3.7948E+00	4.0345E+05	5.0258E-03	0.000E+00	5.951E+01
2.227063E-02	1.41722E+00	3.8678E+00	3.8468E+05	6.2732E-03	0.000E+00	5.567E+01
2.380730E-02	1.64545E+00	3.9320E+00	3.6582E+05	7.7923E-03	0.000E+00	5.208E+01
2.545001E-02	1.87395E+00	3.9866E+00	3.4696E+05	9.6326E-03	0.000E+00	4.872E+01
2.720606E-02	2.10000E+00	4.0307E+00	3.2816E+05	1.1850E-02	0.000E+00	4.557E+01
2.908327E-02	2.31315E+00	4.0636E+00	3.0948E+05	1.4510E-02	0.000E+00	4.263E+01
3.038000E-02	2.42332E+00	4.0786E+00	2.9736E+05	1.6520E-02	0.000E+00	4.081E+01
3.084500E-02	2.42239E+00	4.0826E+00	2.9316E+05	1.7276E-02	0.000E+00	4.020E+01
3.096900E-02	2.37534E+00	4.0835E+00	2.9206E+05	1.7481E-02	0.000E+00	4.003E+01
3.109002E-02	2.42622E+00	4.2017E+00	2.9934E+05	1.7682E-02	0.000E+00	3.988E+01
3.115500E-02	2.45285E+00	4.2031E+00	2.9881E+05	1.7790E-02	0.000E+00	3.980E+01
3.162000E-02	2.55277E+00	4.2127E+00	2.9510E+05	1.8576E-02	0.000E+00	3.921E+01
3.323523E-02	2.77327E+00	4.2434E+00	2.8280E+05	2.1446E-02	0.000E+00	3.731E+01
3.552846E-02	3.04456E+00	4.2797E+00	2.6681E+05	2.5891E-02	0.000E+00	3.490E+01
3.797993E-02	3.31742E+00	4.3029E+00	2.5094E+05	3.1113E-02	0.000E+00	3.264E+01
4.060054E-02	3.59298E+00	4.3112E+00	2.3519E+05	3.7216E-02	0.000E+00	3.054E+01
4.340198E-02	3.87021E+00	4.3036E+00	2.1963E+05	4.4313E-02	0.000E+00	2.857E+01
4.639671E-02	4.14747E+00	4.2796E+00	2.0431E+05	5.2526E-02	0.000E+00	2.672E+01
4.959809E-02	4.42281E+00	4.2389E+00	1.8930E+05	6.1982E-02	0.000E+00	2.500E+01
5.302035E-02	4.69410E+00	4.1815E+00	1.7468E+05	7.2814E-02	0.000E+00	2.338E+01
5.667876E-02	4.95919E+00	4.1078E+00	1.6053E+05	8.5160E-02	0.000E+00	2.187E+01
6.058959E-02	5.21598E+00	4.0186E+00	1.4690E+05	9.9164E-02	0.000E+00	2.046E+01
6.477028E-02	5.46254E+00	3.9150E+00	1.3388E+05	1.1497E-01	0.000E+00	1.914E+01
6.923942E-02	5.69718E+00	3.7985E+00	1.2151E+05	1.3271E-01	0.000E+00	1.791E+01
7.401695E-02	5.91853E+00	3.6708E+00	1.0985E+05	1.5254E-01	0.000E+00	1.675E+01
7.912411E-02	6.12552E+00	3.5338E+00	9.8922E+04	1.7458E-01	0.000E+00	1.567E+01
8.458368E-02	6.31749E+00	3.3894E+00	8.8755E+04	1.9897E-01	0.000E+00	1.466E+01
9.041995E-02	6.49407E+00	3.2395E+00	7.9355E+04	2.2582E-01	0.000E+00	1.371E+01
9.665893E-02	6.65510E+00	3.0860E+00	7.0717E+04	2.5522E-01	0.000E+00	1.283E+01
1.033284E-01	6.80118E+00	2.9308E+00	6.2825E+04	2.8726E-01	0.000E+00	1.200E+01
1.104581E-01	6.93272E+00	2.7755E+00	5.5655E+04	3.2200E-01	0.000E+00	1.122E+01
1.180797E-01	7.05053E+00	2.6214E+00	4.9173E+04	3.5948E-01	0.000E+00	1.050E+01
1.262272E-01	7.15570E+00	2.4699E+00	4.3341E+04	3.9970E-01	0.000E+00	9.822E+00
1.349368E-01	7.24938E+00	2.3217E+00	3.8109E+04	4.4266E-01	0.000E+00	9.188E+00
1.442475E-01	7.33266E+00	2.1774E+00	3.3434E+04	4.8830E-01	0.000E+00	8.595E+00
1.542005E-01	7.40712E+00	2.0380E+00	2.9274E+04	5.3653E-01	0.000E+00	8.040E+00
1.648404E-01	7.47445E+00	1.8939E+00	2.5448E+04	5.8723E-01	0.000E+00	7.521E+00
1.762144E-01	7.52489E+00	1.7353E+00	2.1812E+04	6.4025E-01	0.000E+00	7.036E+00
1.883732E-01	7.55803E+00	1.5870E+00	1.8660E+04	6.9539E-01	0.000E+00	6.582E+00

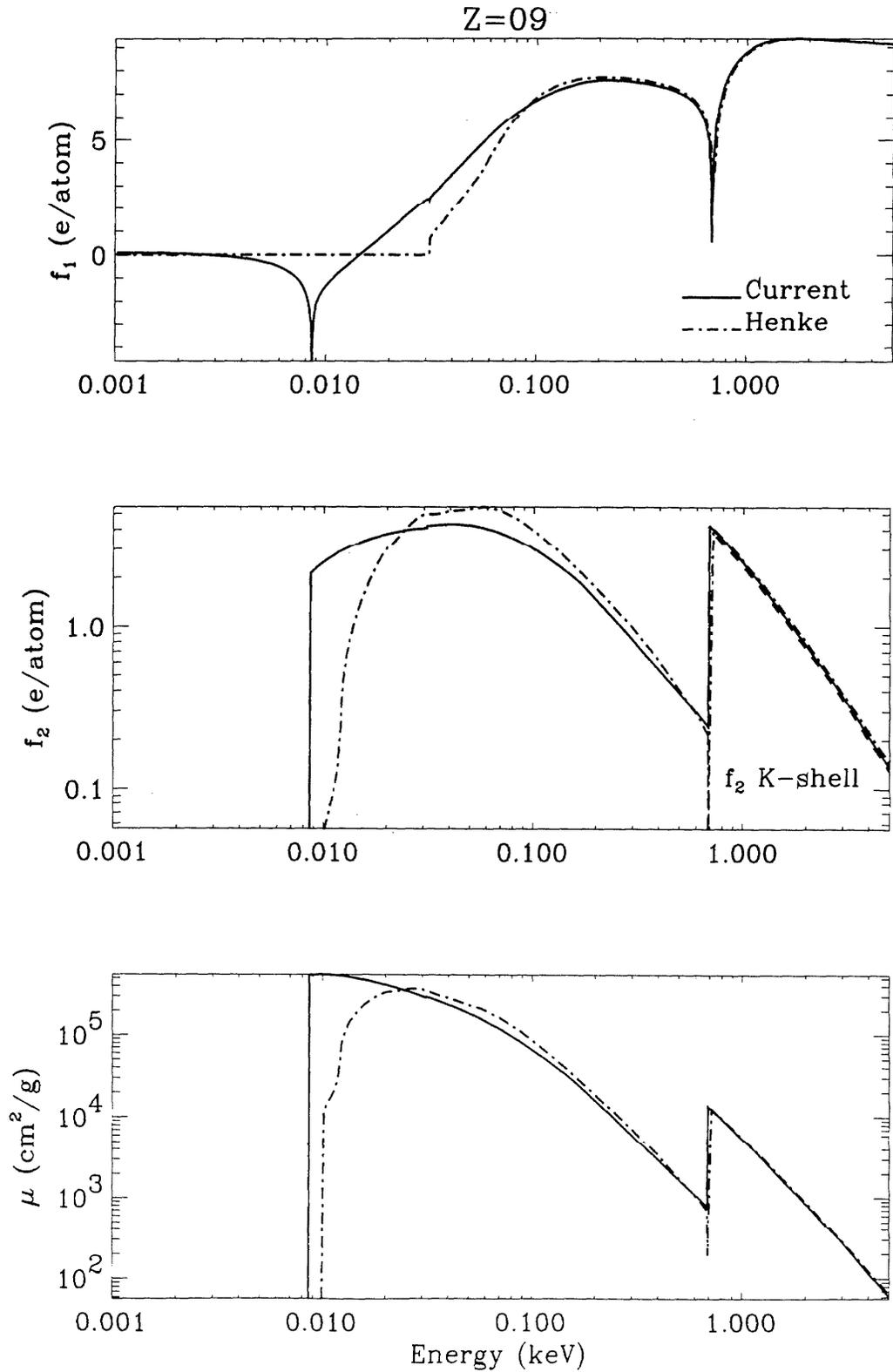
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 125

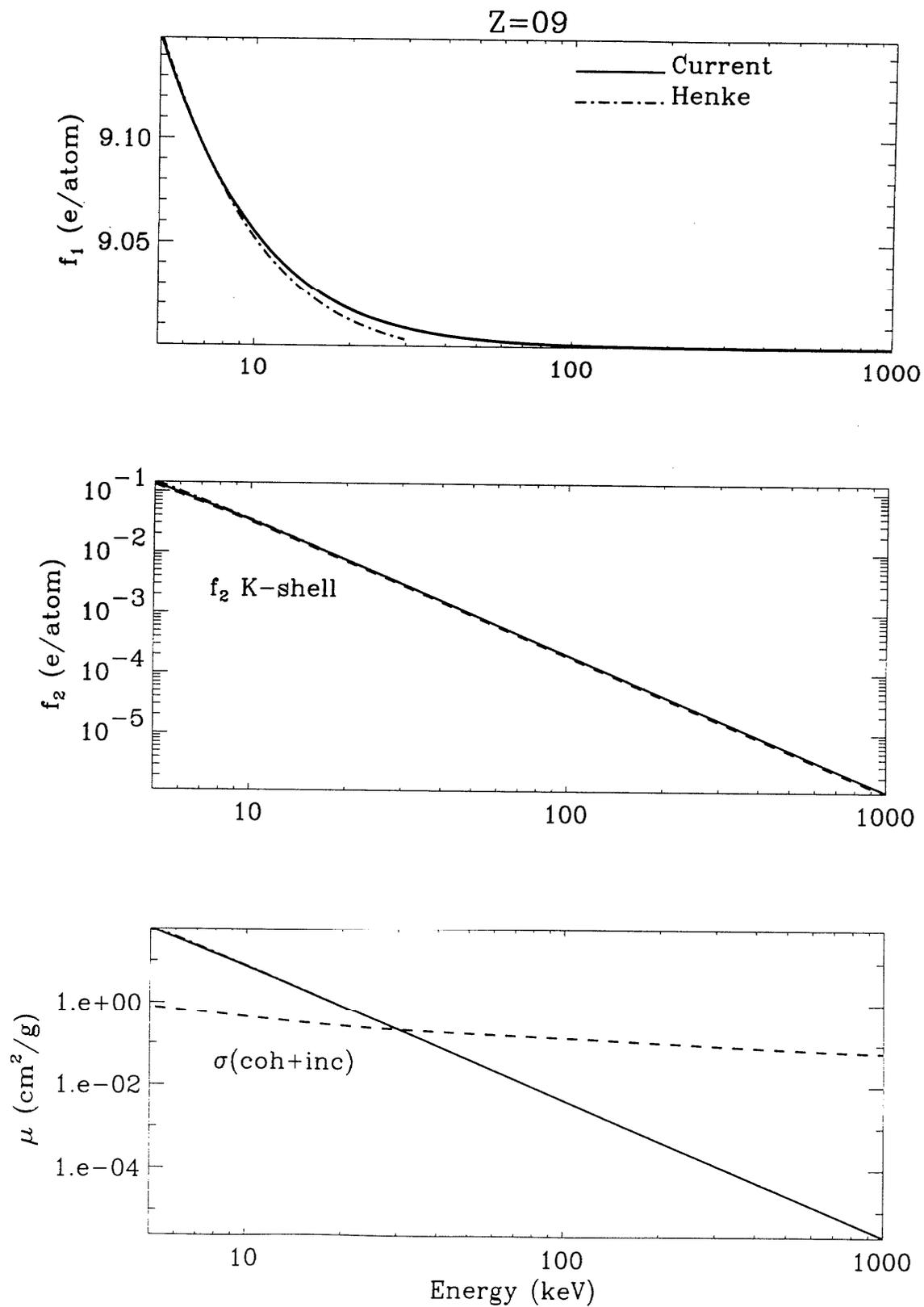
TABLE 1. Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.013709E-01	7.57744E+00	1.4490E+00	1.5938E+04	7.5242E-01	0.000E+00	6.157E+00
2.152655E-01	7.58557E+00	1.3211E+00	1.3594E+04	8.1107E-01	0.000E+00	5.760E+00
2.301188E-01	7.58420E+00	1.2031E+00	1.1580E+04	8.7104E-01	0.000E+00	5.388E+00
2.459970E-01	7.57462E+00	1.0944E+00	9.8541E+03	9.3200E-01	0.000E+00	5.040E+00
2.629708E-01	7.55776E+00	9.9472E-01	8.3783E+03	9.9358E-01	0.000E+00	4.715E+00
2.811158E-01	7.53420E+00	9.0347E-01	7.1185E+03	1.0554E+00	0.000E+00	4.410E+00
3.005128E-01	7.50422E+00	8.2014E-01	6.0449E+03	1.1171E+00	0.000E+00	4.126E+00
3.212482E-01	7.46776E+00	7.4419E-01	5.1311E+03	1.1781E+00	0.000E+00	3.859E+00
3.434143E-01	7.42436E+00	6.7509E-01	4.3541E+03	1.2381E+00	0.000E+00	3.610E+00
3.671099E-01	7.37312E+00	6.1229E-01	3.6942E+03	1.2967E+00	0.000E+00	3.377E+00
3.924405E-01	7.31248E+00	5.5531E-01	3.1342E+03	1.3533E+00	0.000E+00	3.159E+00
4.195189E-01	7.24000E+00	5.0364E-01	2.6591E+03	1.4076E+00	0.000E+00	2.955E+00
4.484657E-01	7.15184E+00	4.5684E-01	2.2563E+03	1.4591E+00	0.000E+00	2.765E+00
4.794098E-01	7.04174E+00	4.1448E-01	1.9149E+03	1.5075E+00	0.000E+00	2.586E+00
5.124891E-01	6.89910E+00	3.7614E-01	1.6257E+03	1.5523E+00	0.000E+00	2.419E+00
5.478508E-01	6.70400E+00	3.4148E-01	1.3806E+03	1.5932E+00	0.000E+00	2.263E+00
5.856525E-01	6.41337E+00	3.0993E-01	1.1721E+03	1.6299E+00	0.000E+00	2.117E+00
6.260625E-01	5.90422E+00	2.7941E-01	9.8852E+02	1.6621E+00	0.000E+00	1.980E+00
6.692609E-01	4.46336E+00	2.5176E-01	8.3322E+02	1.6896E+00	0.000E+00	1.853E+00
6.716920E-01	4.27069E+00	2.5034E-01	8.2551E+02	1.6910E+00	0.000E+00	1.846E+00
6.819730E-01	2.57294E+00	2.4446E-01	7.9395E+02	1.6965E+00	0.000E+00	1.818E+00
6.847146E-01	5.29790E-01	2.4292E-01	7.8582E+02	1.6979E+00	0.000E+00	1.811E+00
6.888270E-01	2.66519E+00	4.2681E+00	1.3724E+04	1.7000E+00	1.295E+04	1.800E+00
6.991080E-01	4.54067E+00	4.1803E+00	1.3244E+04	1.7050E+00	1.250E+04	1.773E+00
7.154399E-01	5.64407E+00	4.0471E+00	1.2529E+04	1.7122E+00	1.183E+04	1.733E+00
7.648052E-01	7.04400E+00	3.6853E+00	1.0673E+04	1.7297E+00	1.008E+04	1.621E+00
8.175768E-01	7.76036E+00	3.3518E+00	9.0805E+03	1.7421E+00	8.583E+03	1.516E+00
8.739896E-01	8.22518E+00	3.0432E+00	7.7124E+03	1.7493E+00	7.293E+03	1.419E+00
9.342948E-01	8.55284E+00	2.7592E+00	6.5412E+03	1.7513E+00	6.188E+03	1.327E+00
9.987612E-01	8.79468E+00	2.4992E+00	5.5424E+03	1.7481E+00	5.245E+03	1.241E+00
1.067676E+00	8.97744E+00	2.2538E+00	4.6757E+03	1.7400E+00	4.430E+03	1.161E+00
1.141345E+00	9.11455E+00	2.0306E+00	3.9407E+03	1.7269E+00	3.737E+03	1.086E+00
1.220098E+00	9.21735E+00	1.8172E+00	3.2990E+03	1.7091E+00	3.130E+03	1.016E+00
1.304285E+00	9.28588E+00	1.6221E+00	2.7547E+03	1.6869E+00	2.615E+03	9.506E-01
1.394281E+00	9.33097E+00	1.4469E+00	2.2985E+03	1.6605E+00	2.182E+03	8.892E-01
1.490486E+00	9.35888E+00	1.2898E+00	1.9167E+03	1.6301E+00	1.820E+03	8.318E-01
1.593329E+00	9.37393E+00	1.1491E+00	1.5974E+03	1.5961E+00	1.517E+03	7.781E-01
1.703269E+00	9.37936E+00	1.0233E+00	1.3306E+03	1.5589E+00	1.264E+03	7.279E-01
1.820795E+00	9.37762E+00	9.1083E-01	1.1080E+03	1.5187E+00	1.053E+03	6.809E-01
1.946430E+00	9.37061E+00	8.1050E-01	9.2231E+02	1.4760E+00	8.762E+02	6.370E-01
2.080733E+00	9.36013E+00	7.2104E-01	7.6755E+02	1.4310E+00	7.292E+02	5.959E-01
2.224304E+00	9.34689E+00	6.4132E-01	6.3862E+02	1.3843E+00	6.067E+02	5.574E-01
2.377781E+00	9.33207E+00	5.7033E-01	5.3127E+02	1.3361E+00	5.046E+02	5.214E-01
2.541848E+00	9.31652E+00	5.0714E-01	4.4192E+02	1.2868E+00	4.197E+02	4.878E-01
2.717235E+00	9.30109E+00	4.5093E-01	3.6758E+02	1.2368E+00	3.491E+02	4.563E-01
2.904724E+00	9.28588E+00	3.9862E-01	3.0396E+02	1.1863E+00	2.885E+02	4.268E-01
3.105150E+00	9.26977E+00	3.5055E-01	2.5005E+02	1.1358E+00	2.373E+02	3.993E-01
3.319406E+00	9.25188E+00	3.0702E-01	2.0487E+02	1.0855E+00	1.944E+02	3.735E-01
3.548445E+00	9.23378E+00	2.6891E-01	1.6785E+02	1.0350E+00	1.593E+02	3.494E-01
3.793288E+00	9.21598E+00	2.3553E-01	1.3753E+02	9.8651E-01	1.305E+02	3.269E-01
4.055024E+00	9.19881E+00	2.0629E-01	1.1268E+02	9.3836E-01	1.069E+02	3.058E-01
4.334821E+00	9.18245E+00	1.8068E-01	9.2321E+01	8.9138E-01	8.760E+01	2.860E-01
4.633924E+00	9.16700E+00	1.5825E-01	7.5642E+01	8.4575E-01	7.178E+01	2.676E-01
4.953664E+00	9.15253E+00	1.3861E-01	6.1977E+01	8.0161E-01	5.881E+01	2.503E-01
5.295467E+00	9.13905E+00	1.2141E-01	5.0782E+01	7.5910E-01	4.818E+01	2.341E-01
5.660855E+00	9.12654E+00	1.0634E-01	4.1609E+01	7.1832E-01	3.948E+01	2.190E-01
6.051453E+00	9.11500E+00	9.3147E-02	3.4093E+01	6.7934E-01	3.234E+01	2.049E-01
6.469004E+00	9.10438E+00	8.1590E-02	2.7936E+01	6.4223E-01	2.650E+01	1.917E-01
6.915365E+00	9.09464E+00	7.1467E-02	2.2890E+01	6.0701E-01	2.171E+01	1.793E-01
7.392525E+00	9.08575E+00	6.2601E-02	1.8757E+01	5.7371E-01	1.779E+01	1.677E-01
7.902609E+00	9.07766E+00	5.4836E-02	1.5369E+01	5.4232E-01	1.457E+01	1.569E-01
8.447890E+00	9.07041E+00	4.8034E-02	1.2594E+01	5.1282E-01	1.194E+01	1.468E-01
9.030794E+00	9.06412E+00	4.1998E-02	1.0301E+01	4.8518E-01	9.765E+00	1.373E-01
9.653919E+00	9.05787E+00	3.6478E-02	8.3693E+00	4.5936E-01	7.934E+00	1.284E-01
1.032004E+01	9.05214E+00	3.1684E-02	6.8001E+00	4.3530E-01	6.446E+00	1.201E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.103212E+01	9.04693E+00	2.7520E-02	5.5252E+00	4.1293E-01	5.238E+00	1.124E-01
1.179334E+01	9.04219E+00	2.3903E-02	4.4893E+00	3.9218E-01	4.255E+00	1.051E-01
1.260708E+01	9.03790E+00	2.0762E-02	3.6477E+00	3.7297E-01	3.458E+00	9.834E-02
1.347697E+01	9.03403E+00	1.7980E-02	2.9550E+00	3.5523E-01	2.800E+00	9.200E-02
1.440688E+01	9.03050E+00	1.5549E-02	2.3905E+00	3.3886E-01	2.265E+00	8.606E-02
1.540095E+01	9.02731E+00	1.3445E-02	1.9337E+00	3.2377E-01	1.832E+00	8.050E-02
1.646362E+01	9.02442E+00	1.1626E-02	1.5641E+00	3.0988E-01	1.482E+00	7.531E-02
1.759961E+01	9.02183E+00	1.0053E-02	1.2652E+00	2.9710E-01	1.198E+00	7.045E-02
1.881398E+01	9.01949E+00	8.6933E-03	1.0234E+00	2.8534E-01	9.691E-01	6.590E-02
2.011215E+01	9.01739E+00	7.5172E-03	8.2787E-01	2.7453E-01	7.838E-01	6.165E-02
2.149988E+01	9.01551E+00	6.5003E-03	6.6967E-01	2.6456E-01	6.339E-01	5.767E-02
2.298338E+01	9.01382E+00	5.6210E-03	5.4170E-01	2.5538E-01	5.127E-01	5.395E-02
2.456923E+01	9.01231E+00	4.8606E-03	4.3819E-01	2.4690E-01	4.147E-01	5.046E-02
2.626450E+01	9.01096E+00	4.2031E-03	3.5446E-01	2.3905E-01	3.354E-01	4.721E-02
2.807676E+01	9.00976E+00	3.6202E-03	2.8559E-01	2.3178E-01	2.702E-01	4.416E-02
3.001405E+01	9.00868E+00	3.1141E-03	2.2981E-01	2.2500E-01	2.174E-01	4.131E-02
3.208502E+01	9.00772E+00	2.6787E-03	1.8492E-01	2.1868E-01	1.749E-01	3.864E-02
3.429889E+01	9.00685E+00	2.3042E-03	1.4880E-01	2.1275E-01	1.407E-01	3.615E-02
3.666551E+01	9.00608E+00	1.9821E-03	1.1974E-01	2.0718E-01	1.132E-01	3.381E-02
3.919543E+01	9.00539E+00	1.7050E-03	9.6351E-02	2.0191E-01	9.106E-02	3.163E-02
4.189992E+01	9.00478E+00	1.4667E-03	7.7532E-02	1.9690E-01	7.326E-02	2.959E-02
4.479101E+01	9.00424E+00	1.2616E-03	6.2389E-02	1.9213E-01	5.894E-02	2.768E-02
4.788159E+01	9.00375E+00	1.0853E-03	5.0203E-02	1.8756E-01	4.742E-02	2.589E-02
5.118542E+01	9.00332E+00	9.3356E-04	4.0398E-02	1.8317E-01	3.815E-02	2.422E-02
5.471721E+01	9.00294E+00	8.0306E-04	3.2508E-02	1.7893E-01	3.069E-02	2.266E-02
5.849270E+01	9.00260E+00	6.9081E-04	2.6159E-02	1.7482E-01	2.469E-02	2.120E-02
6.252870E+01	9.00230E+00	5.9424E-04	2.1050E-02	1.7082E-01	1.987E-02	1.983E-02
6.684318E+01	9.00204E+00	5.1118E-04	1.6939E-02	1.6693E-01	1.598E-02	1.855E-02
7.145536E+01	9.00180E+00	4.3973E-04	1.3630E-02	1.6312E-01	1.286E-02	1.735E-02
7.638578E+01	9.00159E+00	3.7826E-04	1.0968E-02	1.5939E-01	1.035E-02	1.623E-02
8.165640E+01	9.00140E+00	3.2542E-04	8.8270E-03	1.5573E-01	8.324E-03	1.518E-02
8.729069E+01	9.00124E+00	2.8001E-04	7.1050E-03	1.5214E-01	6.699E-03	1.420E-02
9.331374E+01	9.00110E+00	2.4094E-04	5.7190E-03	1.4860E-01	5.391E-03	1.329E-02
9.975239E+01	9.00097E+00	2.0732E-04	4.6033E-03	1.4512E-01	4.339E-03	1.243E-02
1.066353E+02	9.00085E+00	1.7839E-04	3.7053E-03	1.4170E-01	3.492E-03	1.163E-02
1.139931E+02	9.00075E+00	1.5350E-04	2.9825E-03	1.3833E-01	2.810E-03	1.088E-02
1.218587E+02	9.00066E+00	1.3208E-04	2.4007E-03	1.3501E-01	2.261E-03	1.017E-02
1.302669E+02	9.00059E+00	1.1365E-04	1.9324E-03	1.3174E-01	1.820E-03	9.518E-03
1.392553E+02	9.00052E+00	9.7791E-05	1.5554E-03	1.2853E-01	1.465E-03	8.903E-03
1.488640E+02	9.00046E+00	8.4146E-05	1.2520E-03	1.2538E-01	1.179E-03	8.329E-03
1.591356E+02	9.00040E+00	7.2405E-05	1.0078E-03	1.2228E-01	9.485E-04	7.791E-03
1.701159E+02	9.00035E+00	6.2302E-05	8.1119E-04	1.1925E-01	7.633E-04	7.288E-03
1.818539E+02	9.00031E+00	5.3609E-05	6.5295E-04	1.1627E-01	6.143E-04	6.818E-03
1.944018E+02	9.00027E+00	4.6129E-05	5.2558E-04	1.1335E-01	4.944E-04	6.378E-03
2.078156E+02	9.00024E+00	3.9693E-05	4.2306E-04	1.1051E-01	3.978E-04	5.966E-03
2.221548E+02	9.00021E+00	3.4155E-05	3.4053E-04	1.0772E-01	3.202E-04	5.581E-03
2.374835E+02	9.00019E+00	2.9389E-05	2.7411E-04	1.0501E-01	2.577E-04	5.221E-03
2.538699E+02	9.00017E+00	2.5289E-05	2.2064E-04	1.0237E-01	2.074E-04	4.884E-03
2.713869E+02	9.00015E+00	2.1760E-05	1.7760E-04	9.9794E-02	1.669E-04	4.569E-03
2.901126E+02	9.00013E+00	1.8724E-05	1.4296E-04	9.7295E-02	1.343E-04	4.274E-03
3.101304E+02	9.00011E+00	1.6112E-05	1.1507E-04	9.4871E-02	1.081E-04	3.998E-03
3.315294E+02	9.00010E+00	1.3864E-05	9.2625E-05	9.2524E-02	8.697E-05	3.740E-03
3.544049E+02	9.00009E+00	1.1930E-05	7.4558E-05	9.0252E-02	6.999E-05	3.498E-03
3.788588E+02	9.00008E+00	1.0265E-05	6.0014E-05	8.8059E-02	5.633E-05	3.273E-03
4.050001E+02	9.00007E+00	8.8331E-06	4.8308E-05	8.5944E-02	4.533E-05	3.061E-03
4.329451E+02	9.00006E+00	7.6007E-06	3.8885E-05	8.3907E-02	3.648E-05	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 129

Ne Z = 10

Atomic weight = 2.017900E+01 g/mol, nominal density ρ (g/cm³) = 8.3910E-04

μ_e (barns/atom) = μ (cm²/g) × 3.35080E+01, (eV) μ (cm²/g) = f_2 (e/atom) × 2.08535E+06

4 edges. Edge energies (keV):

K 8.66900E-00 L I 4.50000E-02 L II 1.83000E-02 L III 1.83000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.2490E-02, -6.6000E-03 e/atom

Nuclear Thomson correction f_{NT} = -2.7186E-03 e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	5.14761E-01	0.0000E+00	0.0000E+00	1.5256E-04	0.000E+00	1.160E+02
1.142761E-02	4.33365E-01	0.0000E+00	0.0000E+00	2.0627E-04	0.000E+00	1.085E+02
1.221612E-02	3.33357E-01	0.0000E+00	0.0000E+00	2.7730E-04	0.000E+00	1.015E+02
1.305903E-02	2.08132E-01	0.0000E+00	0.0000E+00	3.7071E-04	0.000E+00	9.494E+01
1.396010E-02	4.70096E-02	0.0000E+00	0.0000E+00	4.9283E-04	0.000E+00	8.881E+01
1.492335E-02	-1.69204E-01	0.0000E+00	0.0000E+00	6.5155E-04	0.000E+00	8.308E+01
1.595306E-02	-4.81386E-01	0.0000E+00	0.0000E+00	8.5665E-04	0.000E+00	7.772E+01
1.705382E-02	-1.01047E+00	0.0000E+00	0.0000E+00	1.1202E-03	0.000E+00	7.270E+01
1.793400E-02	-1.97188E+00	0.0000E+00	0.0000E+00	1.3664E-03	0.000E+00	6.913E+01
1.820850E-02	-2.99087E+00	0.0000E+00	0.0000E+00	1.4500E-03	0.000E+00	6.809E+01
1.823053E-02	-3.18853E+00	0.0000E+00	0.0000E+00	1.4568E-03	0.000E+00	6.801E+01
1.828170E-02	-4.13413E+00	0.0000E+00	0.0000E+00	1.4728E-03	0.000E+00	6.782E+01
1.839150E-02	-3.04138E+00	2.2083E+00	2.5039E+05	1.5075E-03	0.000E+00	6.741E+01
1.866600E-02	-2.12394E+00	2.2523E+00	2.5163E+05	1.5967E-03	0.000E+00	6.642E+01
1.948844E-02	-1.40016E+00	2.3856E+00	2.5527E+05	1.8844E-03	0.000E+00	6.362E+01
2.083314E-02	-9.64316E-01	2.6068E+00	2.6094E+05	2.4245E-03	0.000E+00	5.951E+01
2.227063E-02	-6.95045E-01	2.8426E+00	2.6617E+05	3.1029E-03	0.000E+00	5.567E+01
2.380730E-02	-4.70803E-01	3.0893E+00	2.7060E+05	3.9501E-03	0.000E+00	5.208E+01
2.545001E-02	-2.54421E-01	3.3431E+00	2.7393E+05	5.0023E-03	0.000E+00	4.872E+01
2.720606E-02	-2.93826E-02	3.5995E+00	2.7590E+05	6.3019E-03	0.000E+00	4.557E+01
2.908327E-02	2.12777E-01	3.8537E+00	2.7632E+05	7.8981E-03	0.000E+00	4.263E+01
3.109002E-02	4.76291E-01	4.1006E+00	2.7505E+05	9.8478E-03	0.000E+00	3.988E+01
3.323523E-02	7.62562E-01	4.3349E+00	2.7200E+05	1.2216E-02	0.000E+00	3.731E+01
3.552846E-02	1.07065E+00	4.5515E+00	2.6715E+05	1.5078E-02	0.000E+00	3.490E+01
3.797993E-02	1.39717E+00	4.7454E+00	2.6055E+05	1.8517E-02	0.000E+00	3.264E+01
4.060054E-02	1.73490E+00	4.9122E+00	2.5231E+05	2.2627E-02	0.000E+00	3.054E+01
4.340198E-02	2.06269E+00	5.0483E+00	2.4256E+05	2.7512E-02	0.000E+00	2.857E+01
4.410000E-02	2.12873E+00	5.0760E+00	2.4003E+05	2.8808E-02	0.000E+00	2.811E+01
4.477500E-02	2.15951E+00	5.1005E+00	2.3755E+05	3.0090E-02	0.000E+00	2.769E+01
4.495500E-02	2.12160E+00	5.1067E+00	2.3689E+05	3.0437E-02	0.000E+00	2.758E+01
4.522500E-02	2.21023E+00	5.2321E+00	2.4126E+05	3.0961E-02	0.000E+00	2.741E+01
4.590000E-02	2.33986E+00	5.2606E+00	2.3900E+05	3.2291E-02	0.000E+00	2.701E+01
4.639671E-02	2.41484E+00	5.2805E+00	2.3734E+05	3.3289E-02	0.000E+00	2.672E+01
4.659809E-02	2.83688E+00	5.3892E+00	2.2659E+05	4.0082E-02	0.000E+00	2.500E+01
5.302035E-02	3.25250E+00	5.4705E+00	2.1516E+05	4.8027E-02	0.000E+00	2.338E+01
5.667876E-02	3.67274E+00	5.5205E+00	2.0311E+05	5.7273E-02	0.000E+00	2.187E+01
6.058959E-02	4.09378E+00	5.5384E+00	1.9062E+05	6.7973E-02	0.000E+00	2.046E+01
6.477028E-02	4.51362E+00	5.5237E+00	1.7784E+05	8.0292E-02	0.000E+00	1.914E+01
6.923942E-02	4.92887E+00	5.4767E+00	1.6495E+05	9.4399E-02	0.000E+00	1.791E+01
7.401695E-02	5.33657E+00	5.3983E+00	1.5209E+05	1.1047E-01	0.000E+00	1.675E+01
7.912411E-02	5.73279E+00	5.2860E+00	1.3932E+05	1.2868E-01	0.000E+00	1.567E+01
8.458368E-02	6.11057E+00	5.1415E+00	1.2676E+05	1.4920E-01	0.000E+00	1.466E+01
9.041995E-02	6.46494E+00	4.9692E+00	1.1460E+05	1.7222E-01	0.000E+00	1.371E+01
9.665893E-02	6.79261E+00	4.7741E+00	1.0300E+05	1.9789E-01	0.000E+00	1.283E+01
1.033284E-01	7.09156E+00	4.5611E+00	9.2050E+04	2.2637E-01	0.000E+00	1.200E+01
1.104581E-01	7.36082E+00	4.3350E+00	8.1840E+04	2.5781E-01	0.000E+00	1.122E+01
1.180797E-01	7.60028E+00	4.1003E+00	7.2414E+04	2.9232E-01	0.000E+00	1.050E+01
1.262272E-01	7.81058E+00	3.8613E+00	6.3791E+04	3.3002E-01	0.000E+00	9.822E+00
1.349368E-01	7.99292E+00	3.6215E+00	5.5968E+04	3.7096E-01	0.000E+00	9.188E+00
1.442475E-01	8.14807E+00	3.3842E+00	4.8925E+04	4.1520E-01	0.000E+00	8.595E+00
1.542005E-01	8.27968E+00	3.1520E+00	4.2627E+04	4.6275E-01	0.000E+00	8.040E+00
1.648404E-01	8.38901E+00	2.9270E+00	3.7029E+04	5.1358E-01	0.000E+00	7.521E+00

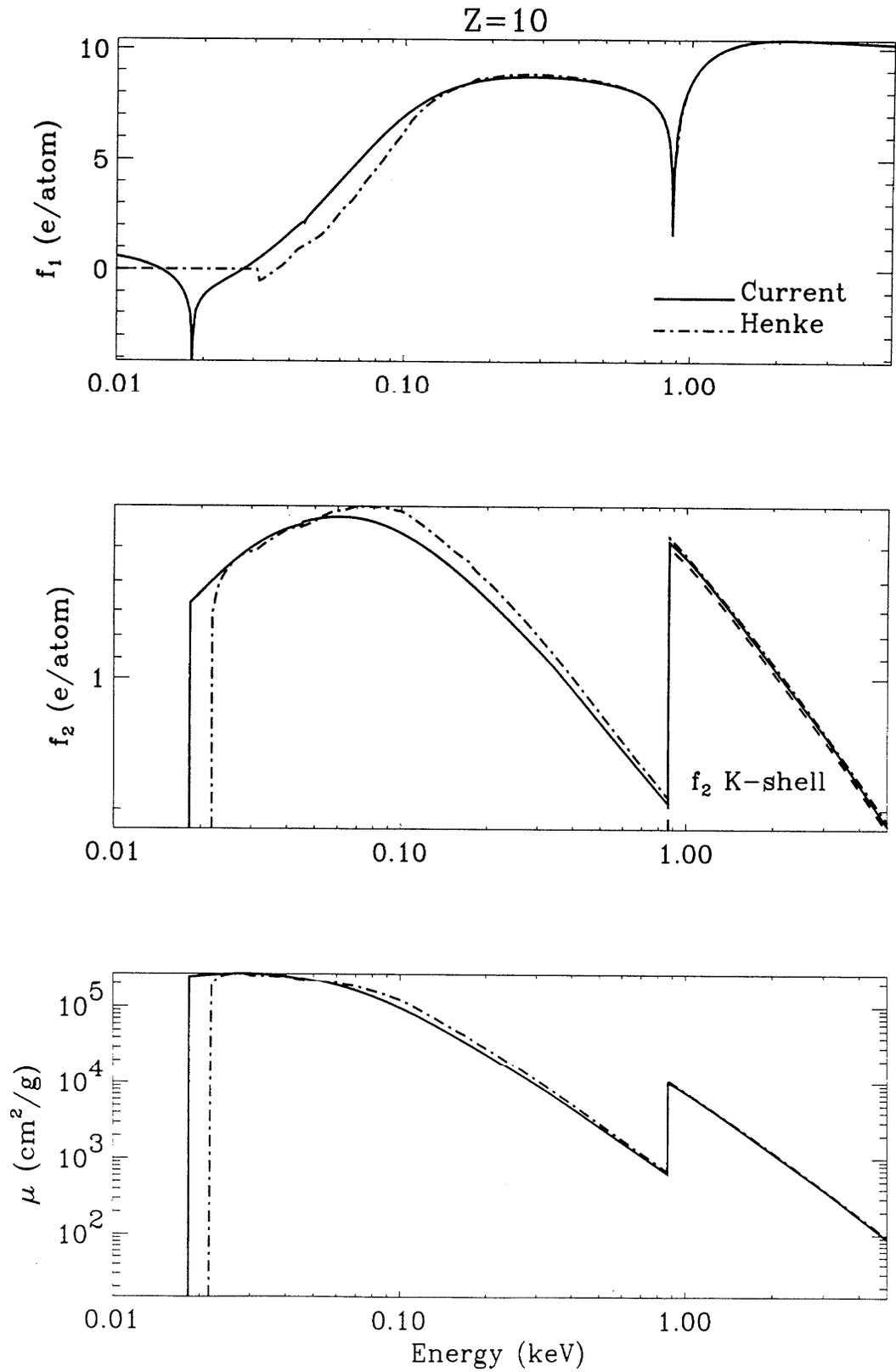
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.762144E-01	8.47827E+00	2.7109E+00	3.2081E+04	5.6761E-01	0.000E+00	7.036E+00
1.883732E-01	8.54971E+00	2.5047E+00	2.7728E+04	6.2473E-01	0.000E+00	6.582E+00
2.013709E-01	8.60523E+00	2.3089E+00	2.3910E+04	6.8479E-01	0.000E+00	6.157E+00
2.152655E-01	8.64653E+00	2.1241E+00	2.0577E+04	7.4758E-01	0.000E+00	5.760E+00
2.301188E-01	8.67533E+00	1.9506E+00	1.7677E+04	8.1285E-01	0.000E+00	5.388E+00
2.459970E-01	8.69321E+00	1.7886E+00	1.5162E+04	8.8030E-01	0.000E+00	5.040E+00
2.629708E-01	8.70161E+00	1.6378E+00	1.2988E+04	9.4959E-01	0.000E+00	4.715E+00
2.811158E-01	8.70179E+00	1.4980E+00	1.1112E+04	1.0203E+00	0.000E+00	4.410E+00
3.005128E-01	8.69485E+00	1.3688E+00	9.4984E+03	1.0921E+00	0.000E+00	4.126E+00
3.212482E-01	8.68175E+00	1.2497E+00	8.1122E+03	1.1644E+00	0.000E+00	3.859E+00
3.434143E-01	8.66338E+00	1.1402E+00	6.9235E+03	1.2368E+00	0.000E+00	3.610E+00
3.671099E-01	8.63782E+00	1.0288E+00	5.8440E+03	1.3088E+00	0.000E+00	3.377E+00
3.924405E-01	8.60277E+00	9.2751E-01	4.9286E+03	1.3798E+00	0.000E+00	3.159E+00
4.195189E-01	8.55918E+00	8.3571E-01	4.1541E+03	1.4494E+00	0.000E+00	2.955E+00
4.484657E-01	8.50711E+00	7.5265E-01	3.4998E+03	1.5168E+00	0.000E+00	2.765E+00
4.794098E-01	8.44583E+00	6.7764E-01	2.9476E+03	1.5817E+00	0.000E+00	2.586E+00
5.124891E-01	8.37371E+00	6.0999E-01	2.4821E+03	1.6435E+00	0.000E+00	2.419E+00
5.478508E-01	8.28790E+00	5.4905E-01	2.0899E+03	1.7017E+00	0.000E+00	2.263E+00
5.856525E-01	8.18372E+00	4.9421E-01	1.7598E+03	1.7558E+00	0.000E+00	2.117E+00
6.260625E-01	8.05325E+00	4.4490E-01	1.4819E+03	1.8054E+00	0.000E+00	1.980E+00
6.692609E-01	7.88235E+00	4.0059E-01	1.2482E+03	1.8500E+00	0.000E+00	1.853E+00
7.154399E-01	7.64279E+00	3.6079E-01	1.0516E+03	1.8893E+00	0.000E+00	1.733E+00
7.648052E-01	7.26655E+00	3.2506E-01	8.8632E+02	1.9231E+00	0.000E+00	1.621E+00
8.175768E-01	6.51081E+00	2.9299E-01	7.4731E+02	1.9510E+00	0.000E+00	1.516E+00
8.495620E-01	5.31790E+00	2.7594E-01	6.7732E+02	1.9643E+00	0.000E+00	1.459E+00
8.625655E-01	3.62497E+00	2.6917E-01	6.5076E+02	1.9691E+00	0.000E+00	1.437E+00
8.660331E-01	1.59294E+00	2.6742E-01	6.4392E+02	1.9703E+00	0.000E+00	1.432E+00
8.712345E-01	3.70829E+00	4.2677E+00	1.0215E+04	1.9720E+00	0.000E+00	1.423E+00
8.739896E-01	4.35896E+00	4.2510E+00	1.0143E+04	1.9729E+00	0.000E+00	1.419E+00
8.842380E-01	5.56519E+00	4.1899E+00	9.8813E+03	1.9761E+00	0.000E+00	1.402E+00
9.342948E-01	7.48184E+00	3.9130E+00	8.7339E+03	1.9887E+00	0.000E+00	1.327E+00
9.987612E-01	8.47076E+00	3.5924E+00	7.5006E+03	1.9982E+00	0.000E+00	1.241E+00
1.067676E+00	9.07296E+00	3.2552E+00	6.3579E+03	2.0015E+00	0.000E+00	1.161E+00
1.141345E+00	9.47400E+00	2.9372E+00	5.3666E+03	1.9987E+00	0.000E+00	1.086E+00
1.220098E+00	9.75622E+00	2.6424E+00	4.5163E+03	1.9898E+00	0.000E+00	1.016E+00
1.304285E+00	9.95856E+00	2.3724E+00	3.7931E+03	1.9750E+00	0.000E+00	9.506E-01
1.394281E+00	1.01050E+01	2.1276E+00	3.1821E+03	1.9547E+00	0.000E+00	8.892E-01
1.490486E+00	1.021131E+01	1.9048E+00	2.6651E+03	1.9289E+00	0.000E+00	8.318E-01
1.593329E+00	1.02871E+01	1.6988E+00	2.2234E+03	1.8981E+00	0.000E+00	7.781E-01
1.703269E+00	1.03356E+01	1.5147E+00	1.8545E+03	1.8626E+00	0.000E+00	7.279E-01
1.820795E+00	1.03659E+01	1.3502E+00	1.5464E+03	1.8227E+00	0.000E+00	6.809E-01
1.946430E+00	1.03828E+01	1.2033E+00	1.2892E+03	1.7790E+00	0.000E+00	6.370E-01
2.080733E+00	1.03896E+01	1.0721E+00	1.0745E+03	1.7318E+00	0.000E+00	5.959E-01
2.224304E+00	1.03890E+01	9.5490E-01	8.9525E+02	1.6816E+00	0.000E+00	5.574E-01
2.377781E+00	1.03830E+01	8.5029E-01	7.4572E+02	1.6287E+00	0.000E+00	5.214E-01
2.541848E+00	1.03731E+01	7.5695E-01	6.2101E+02	1.5737E+00	0.000E+00	4.878E-01
2.717235E+00	1.03599E+01	6.7370E-01	5.1703E+02	1.5171E+00	0.000E+00	4.563E-01
2.904724E+00	1.03456E+01	5.9950E-01	4.3039E+02	1.4592E+00	0.000E+00	4.268E-01
3.105150E+00	1.03349E+01	5.3135E-01	3.5685E+02	1.4004E+00	0.000E+00	3.993E-01
3.319406E+00	1.03186E+01	4.6926E-01	2.9480E+02	1.3412E+00	0.000E+00	3.735E-01
3.548445E+00	1.03011E+01	4.1343E-01	2.4297E+02	1.2820E+00	0.000E+00	3.494E-01
3.793288E+00	1.02822E+01	3.6257E-01	1.9932E+02	1.2230E+00	0.000E+00	3.269E-01
4.055024E+00	1.02628E+01	3.1798E-01	1.6353E+02	1.1647E+00	0.000E+00	3.058E-01
4.334821E+00	1.02434E+01	2.7888E-01	1.3416E+02	1.1073E+00	0.000E+00	2.860E-01
4.633924E+00	1.02247E+01	2.4459E-01	1.1007E+02	1.0511E+00	0.000E+00	2.676E-01
4.953664E+00	1.02067E+01	2.1452E-01	9.0306E+01	9.9634E-01	0.000E+00	2.503E-01
5.295467E+00	1.01896E+01	1.8815E-01	7.4093E+01	9.4321E-01	0.000E+00	2.341E-01
5.660855E+00	1.01736E+01	1.6502E-01	6.0791E+01	8.9190E-01	0.000E+00	2.190E-01
6.051453E+00	1.01586E+01	1.4474E-01	4.9879E+01	8.4254E-01	0.000E+00	2.049E-01
6.469004E+00	1.01447E+01	1.2696E-01	4.0925E+01	7.9526E-01	0.000E+00	1.917E-01
6.915365E+00	1.01319E+01	1.1136E-01	3.3580E+01	7.5014E-01	0.000E+00	1.793E-01
7.392525E+00	1.01200E+01	9.7675E-02	2.7553E+01	7.0723E-01	0.000E+00	1.677E-01
7.902609E+00	1.01091E+01	8.5676E-02	2.2608E+01	6.6658E-01	0.000E+00	1.569E-01
8.447890E+00	1.00992E+01	7.5151E-02	1.8551E+01	6.2818E-01	0.000E+00	1.468E-01
9.030794E+00	1.00903E+01	6.5788E-02	1.5192E+01	5.9205E-01	0.000E+00	1.373E-01

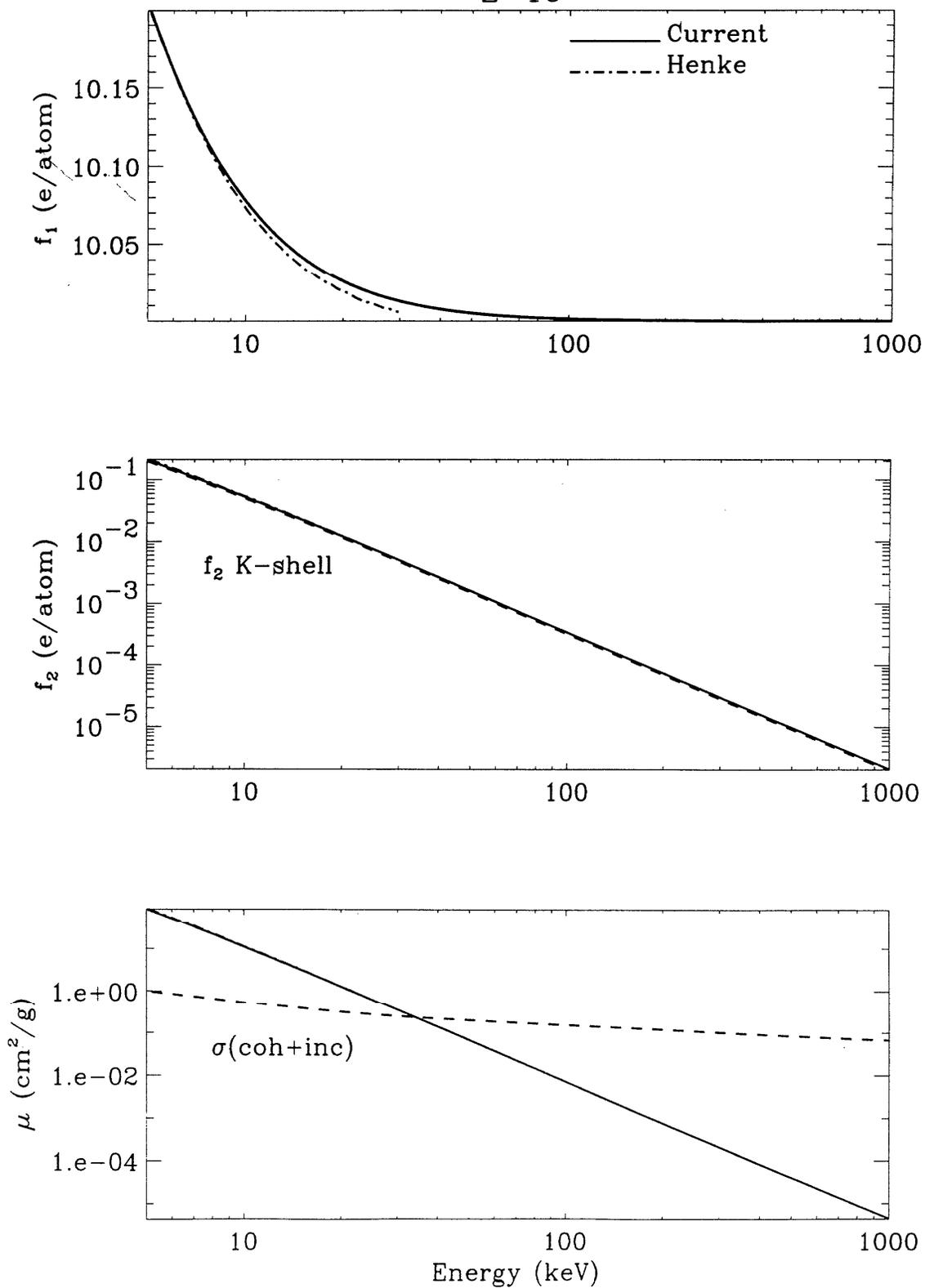
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 131

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
9.653919E+00	1.00818E+01	5.7186E-02	1.2353E+01	5.5814E-01	1.170E+01	1.284E-01
1.032004E+01	1.00740E+01	4.9709E-02	1.0045E+01	5.2642E-01	9.513E+00	1.201E-01
1.103212E+01	1.00668E+01	4.3210E-02	8.1677E+00	4.9682E-01	7.735E+00	1.124E-01
1.179334E+01	1.00602E+01	3.7561E-02	6.6416E+00	4.6928E-01	6.290E+00	1.051E-01
1.260708E+01	1.00542E+01	3.2650E-02	5.4007E+00	4.4372E-01	5.115E+00	9.834E-02
1.347697E+01	1.00487E+01	2.8382E-02	4.3917E+00	4.2004E-01	4.159E+00	9.200E-02
1.440688E+01	1.00438E+01	2.4672E-02	3.5712E+00	3.9816E-01	3.382E+00	8.606E-02
1.540095E+01	1.00393E+01	2.1447E-02	2.9040E+00	3.7797E-01	2.750E+00	8.050E-02
1.646362E+01	1.00353E+01	1.8630E-02	2.3598E+00	3.5938E-01	2.234E+00	7.531E-02
1.759961E+01	1.00316E+01	1.6125E-02	1.9106E+00	3.4227E-01	1.809E+00	7.045E-02
1.881398E+01	1.00283E+01	1.3956E-02	1.5469E+00	3.2655E-01	1.464E+00	6.590E-02
2.011215E+01	1.00253E+01	1.2079E-02	1.2525E+00	3.1211E-01	1.185E+00	6.165E-02
2.149988E+01	1.00226E+01	1.0454E-02	1.0139E+00	2.9886E-01	9.591E-01	5.767E-02
2.298338E+01	1.00202E+01	9.0465E-03	8.2082E-01	2.8669E-01	7.763E-01	5.395E-02
2.456923E+01	1.00180E+01	7.8288E-03	6.6448E-01	2.7552E-01	6.283E-01	5.046E-02
2.626450E+01	1.00161E+01	6.7750E-03	5.3792E-01	2.6524E-01	5.086E-01	4.721E-02
2.807676E+01	1.00144E+01	5.8415E-03	4.3387E-01	2.5578E-01	4.101E-01	4.416E-02
3.001405E+01	1.00128E+01	5.0307E-03	3.4953E-01	2.4706E-01	3.304E-01	4.131E-02
3.208502E+01	1.00114E+01	4.3323E-03	2.8158E-01	2.3900E-01	2.661E-01	3.864E-02
3.429889E+01	1.00101E+01	3.7310E-03	2.2684E-01	2.3152E-01	2.143E-01	3.615E-02
3.666551E+01	1.00090E+01	3.2131E-03	1.8275E-01	2.2457E-01	1.726E-01	3.381E-02
3.919543E+01	1.00080E+01	2.7671E-03	1.4722E-01	2.1809E-01	1.391E-01	3.163E-02
4.189992E+01	1.00071E+01	2.3830E-03	1.1860E-01	2.1202E-01	1.120E-01	2.959E-02
4.479101E+01	1.00063E+01	2.0523E-03	9.5549E-02	2.0631E-01	9.022E-02	2.768E-02
4.788159E+01	1.00056E+01	1.7674E-03	7.6976E-02	2.0091E-01	7.267E-02	2.589E-02
5.118542E+01	1.00050E+01	1.5221E-03	6.2013E-02	1.9580E-01	5.853E-02	2.422E-02
5.471721E+01	1.00044E+01	1.3109E-03	4.9959E-02	1.9092E-01	4.715E-02	2.266E-02
5.849270E+01	1.00039E+01	1.1289E-03	4.0248E-02	1.8626E-01	3.797E-02	2.120E-02
6.252870E+01	1.00034E+01	9.7225E-04	3.2425E-02	1.8178E-01	3.059E-02	1.983E-02
6.684318E+01	1.00031E+01	8.3732E-04	2.6122E-02	1.7746E-01	2.464E-02	1.855E-02
7.145536E+01	1.00027E+01	7.2111E-04	2.1045E-02	1.7327E-01	1.984E-02	1.735E-02
7.638578E+01	1.00024E+01	6.2104E-04	1.6954E-02	1.6921E-01	1.598E-02	1.623E-02
8.165640E+01	1.00021E+01	5.3516E-04	1.3667E-02	1.6526E-01	1.288E-02	1.518E-02
8.729609E+01	1.00019E+01	4.6175E-04	1.1031E-02	1.6140E-01	1.040E-02	1.420E-02
9.331374E+01	1.00016E+01	3.9840E-04	8.9035E-03	1.5763E-01	8.391E-03	1.329E-02
9.975239E+01	1.00015E+01	3.4375E-04	7.1863E-03	1.5394E-01	6.772E-03	1.243E-02
1.066353E+02	1.00013E+01	2.9660E-04	5.8003E-03	1.5031E-01	5.466E-03	1.163E-02
1.139931E+02	1.00011E+01	2.5591E-04	4.6816E-03	1.4675E-01	4.411E-03	1.088E-02
1.218587E+02	1.00010E+01	2.2081E-04	3.7787E-03	1.4326E-01	3.560E-03	1.017E-02
1.302669E+02	1.00009E+01	1.9052E-04	3.0499E-03	1.3982E-01	2.873E-03	9.518E-03
1.392553E+02	1.00008E+01	1.6439E-04	2.4617E-03	1.3645E-01	2.319E-03	8.903E-03
1.488640E+02	1.00007E+01	1.4184E-04	1.9870E-03	1.3313E-01	1.871E-03	8.329E-03
1.591356E+02	1.00006E+01	1.2238E-04	1.6037E-03	1.2987E-01	1.510E-03	7.791E-03
1.701159E+02	1.00005E+01	1.0560E-04	1.2945E-03	1.2667E-01	1.219E-03	7.288E-03
1.818539E+02	1.00005E+01	9.1113E-05	1.0448E-03	1.2352E-01	9.838E-04	6.818E-03
1.944018E+02	1.00004E+01	7.8615E-05	8.4331E-04	1.2044E-01	7.940E-04	6.378E-03
2.078156E+02	1.00004E+01	6.7832E-05	6.8067E-04	1.1742E-01	6.408E-04	5.966E-03
2.221548E+02	1.00003E+01	5.8528E-05	5.4940E-04	1.1446E-01	5.171E-04	5.581E-03
2.374835E+02	1.00003E+01	5.0500E-05	4.4344E-04	1.1157E-01	4.174E-04	5.221E-03
2.538699E+02	1.00003E+01	4.3573E-05	3.5792E-04	1.0874E-01	3.368E-04	4.884E-03
2.713869E+02	1.00002E+01	3.7597E-05	2.8890E-04	1.0599E-01	2.718E-04	4.569E-03
2.901126E+02	1.00002E+01	3.2440E-05	2.3318E-04	1.0330E-01	2.194E-04	4.274E-03
3.101304E+02	1.00002E+01	2.7990E-05	1.8821E-04	1.0068E-01	1.771E-04	3.998E-03
3.315294E+02	1.00002E+01	2.4151E-05	1.5191E-04	9.8129E-02	1.429E-04	3.740E-03
3.544049E+02	1.00001E+01	2.0839E-05	1.2262E-04	9.5654E-02	1.153E-04	3.498E-03
3.788588E+02	1.00001E+01	1.7980E-05	9.8970E-05	9.3253E-02	9.308E-05	3.273E-03
4.050001E+02	1.00001E+01	1.5514E-05	7.9883E-05	9.0926E-02	7.512E-05	3.061E-03
4.329451E+02	1.00001E+01	1.3386E-05	6.4478E-05	8.8675E-02	6.063E-05	2.864E-03



Z=10



Na $Z = 11$ Atomic weight = 2.298980E+01 g/mol, nominal density ρ (g/cm³) = 9.6900E-01 μ_a (barns/atom) = μ (cm²/g) \times 3.81755E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.83039E+06

4 edges. Edge energies (keV):

K 1.07210E+00 L I 6.33000E-02 L II 3.11000E-02 L III 3.11000E-02
 Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.5378E-02, -8.4000E-03 e/atom
 Nuclear Thomson correction f_{NT} = -2.8873E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.48693E+00	0.0000E+00	0.0000E+00	6.6576E-05	0.000E+00	1.160E+02
1.142761E-02	1.46241E+00	0.0000E+00	0.0000E+00	9.1556E-05	0.000E+00	1.085E+02
1.221612E-02	1.43394E+00	0.0000E+00	0.0000E+00	1.2517E-04	0.000E+00	1.015E+02
1.305903E-02	1.40080E+00	0.0000E+00	0.0000E+00	1.7014E-04	0.000E+00	9.494E+01
1.396010E-02	1.36209E+00	0.0000E+00	0.0000E+00	2.2993E-04	0.000E+00	8.881E+01
1.492335E-02	1.31670E+00	0.0000E+00	0.0000E+00	3.0896E-04	0.000E+00	8.308E+01
1.595306E-02	1.26325E+00	0.0000E+00	0.0000E+00	4.1278E-04	0.000E+00	7.772E+01
1.705382E-02	1.19992E+00	0.0000E+00	0.0000E+00	5.4837E-04	0.000E+00	7.270E+01
1.823053E-02	1.12436E+00	0.0000E+00	0.0000E+00	7.2441E-04	0.000E+00	6.801E+01
1.948844E-02	1.03337E+00	0.0000E+00	0.0000E+00	9.5163E-04	0.000E+00	6.362E+01
2.083314E-02	9.22475E-01	0.0000E+00	0.0000E+00	1.2432E-03	0.000E+00	5.951E+01
2.227063E-02	7.85105E-01	0.0000E+00	0.0000E+00	1.6152E-03	0.000E+00	5.567E+01
2.380730E-02	6.10932E-01	0.0000E+00	0.0000E+00	2.0870E-03	0.000E+00	5.208E+01
2.545001E-02	3.87047E-01	0.0000E+00	0.0000E+00	2.6821E-03	0.000E+00	4.872E+01
2.720606E-02	6.19150E-02	0.0000E+00	0.0000E+00	3.4282E-03	0.000E+00	4.557E+01
2.908327E-02	-4.52629E-01	0.0000E+00	0.0000E+00	4.3585E-03	0.000E+00	4.263E+01
3.047800E-02	-1.22048E+00	0.0000E+00	0.0000E+00	5.1423E-03	0.000E+00	4.068E+01
3.094450E-02	-1.96928E+00	0.0000E+00	0.0000E+00	5.4225E-03	0.000E+00	4.007E+01
3.109002E-02	-3.28343E+00	0.0000E+00	0.0000E+00	5.5118E-03	0.000E+00	3.988E+01
3.125550E-02	-2.07435E+00	1.4752E+00	8.6393E+04	5.6145E-03	0.000E+00	3.967E+01
3.172200E-02	-1.54870E+00	1.5580E+00	8.9898E+04	5.9101E-03	0.000E+00	3.908E+01
3.323523E-02	-1.24532E+00	1.8498E+00	1.0188E+05	6.9336E-03	0.000E+00	3.731E+01
3.552846E-02	-1.15725E+00	2.3528E+00	1.2122E+05	8.6765E-03	0.000E+00	3.490E+01
3.797993E-02	-1.06542E+00	2.9049E+00	1.4000E+05	1.0801E-02	0.000E+00	3.264E+01
4.060054E-02	-9.09350E-01	3.4793E+00	1.5686E+05	1.3377E-02	0.000E+00	3.054E+01
4.340198E-02	-6.70261E-01	4.0538E+00	1.7096E+05	1.6482E-02	0.000E+00	2.857E+01
4.639671E-02	-3.44944E-01	4.6061E+00	1.8177E+05	2.0704E-02	0.000E+00	2.672E+01
4.959809E-02	6.01422E-02	5.1157E+00	1.8879E+05	2.4643E-02	0.000E+00	2.500E+01
5.302035E-02	5.30816E-01	5.5651E+00	1.9212E+05	2.9906E-02	0.000E+00	2.338E+01
5.667876E-02	1.04425E+00	5.9411E+00	1.9186E+05	3.6113E-02	0.000E+00	2.187E+01
6.058959E-02	1.55378E+00	6.2352E+00	1.8836E+05	4.3394E-02	0.000E+00	2.046E+01
6.203400E-02	1.69884E+00	6.3186E+00	1.8644E+05	4.6247E-02	0.000E+00	1.999E+01
6.298350E-02	1.71644E+00	6.3666E+00	1.8502E+05	4.8169E-02	0.000E+00	1.969E+01
6.323670E-02	1.61823E+00	6.3785E+00	1.8463E+05	4.8688E-02	0.000E+00	1.961E+01
6.361650E-02	1.79758E+00	6.6559E+00	1.9151E+05	4.9472E-02	0.000E+00	1.949E+01
6.456600E-02	2.03826E+00	6.7090E+00	1.9019E+05	5.1456E-02	0.000E+00	1.920E+01
6.477028E-02	2.07828E+00	6.7198E+00	1.8990E+05	5.1887E-02	0.000E+00	1.914E+01
6.923942E-02	2.80061E+00	6.9123E+00	1.8273E+05	6.1742E-02	0.000E+00	1.791E+01
7.401695E-02	3.48119E+00	7.0330E+00	1.7392E+05	7.3116E-02	0.000E+00	1.675E+01
7.912411E-02	4.14977E+00	7.0777E+00	1.6377E+05	8.6170E-02	0.000E+00	1.567E+01
8.458368E-02	4.79962E+00	7.0494E+00	1.5255E+05	1.0108E-01	0.000E+00	1.466E+01
9.041995E-02	5.42266E+00	6.9560E+00	1.4081E+05	1.1800E-01	0.000E+00	1.371E+01
9.665893E-02	6.01127E+00	6.8045E+00	1.2885E+05	1.3712E-01	0.000E+00	1.283E+01
1.033284E-01	6.56006E+00	6.6036E+00	1.1698E+05	1.5860E-01	0.000E+00	1.200E+01
1.104581E-01	7.06488E+00	6.3621E+00	1.0543E+05	1.8260E-01	0.000E+00	1.122E+01
1.180797E-01	7.52371E+00	6.0888E+00	9.4384E+04	2.0928E-01	0.000E+00	1.050E+01
1.262272E-01	7.93649E+00	5.7918E+00	8.3986E+04	2.3878E-01	0.000E+00	9.822E+00
1.349368E-01	8.30337E+00	5.4758E+00	7.4278E+04	2.7122E-01	0.000E+00	9.188E+00
1.442475E-01	8.62338E+00	5.1475E+00	6.5318E+04	3.0670E-01	0.000E+00	8.595E+00
1.542003E-01	8.89786E+00	4.8145E+00	5.7149E+04	3.4530E-01	0.000E+00	8.040E+00
1.648404E-01	9.12956E+00	4.4830E+00	4.9779E+04	3.8706E-01	0.000E+00	7.521E+00
1.762144E-01	9.32200E+00	4.1579E+00	4.3189E+04	4.3200E-01	0.000E+00	7.036E+00
1.883739E-01	9.47907E+00	3.8431E+00	3.7342E+04	4.8010E-01	0.000E+00	6.582E+00
2.013709E-01	9.60562E+00	3.5414E+00	3.2190E+04	5.3130E-01	0.000E+00	6.157E+00

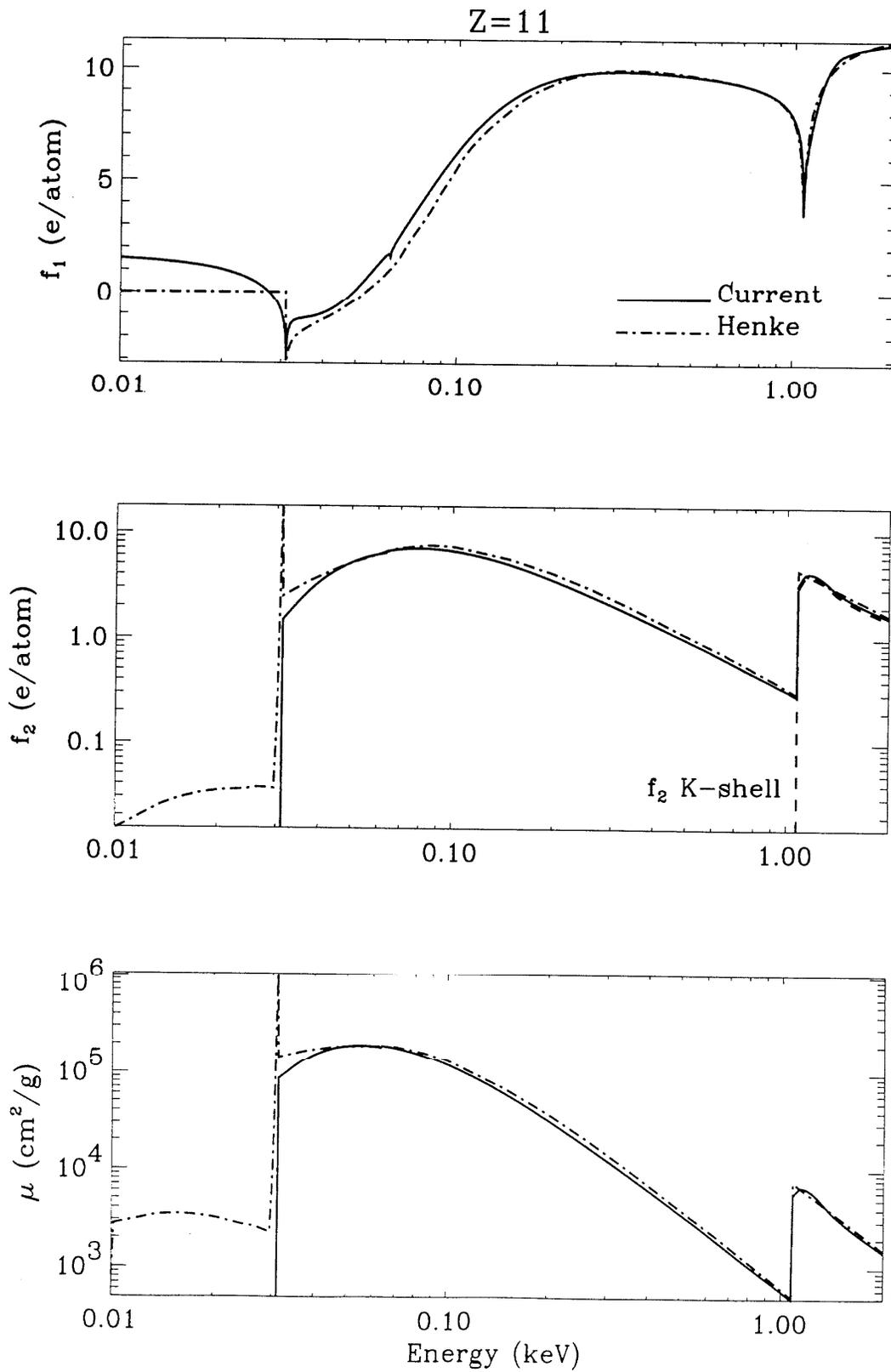
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 135

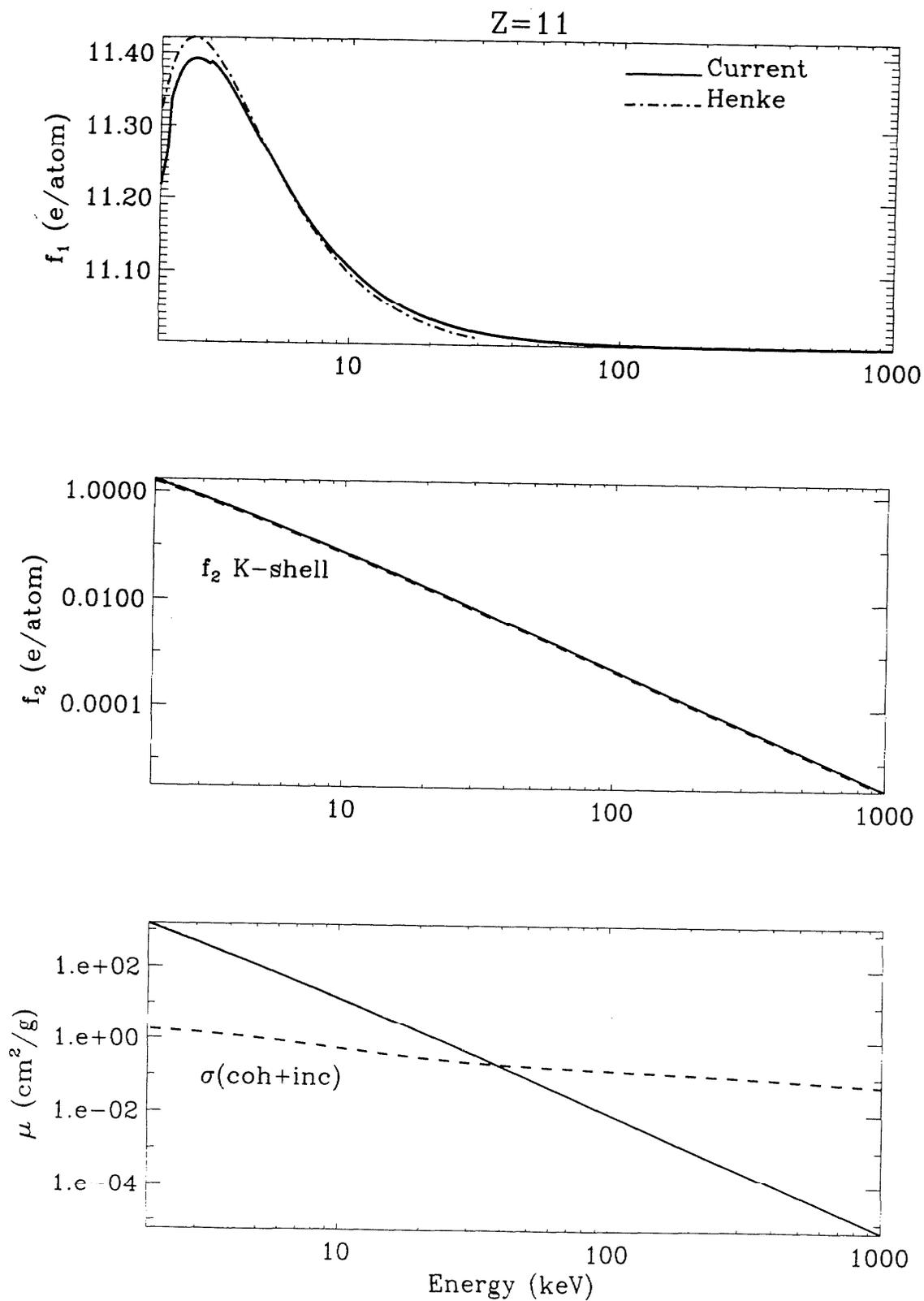
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.152655E-01	9.70360E+00	3.2547E+00	2.7675E+04	5.8548E-01	0.000E+00	5.760E+00
2.301188E-01	9.77764E+00	2.9844E+00	2.3739E+04	6.4250E-01	0.000E+00	5.388E+00
2.459970E-01	9.83116E+00	2.7312E+00	2.0322E+04	7.0217E-01	0.000E+00	5.040E+00
2.629708E-01	9.86727E+00	2.4950E+00	1.7366E+04	7.6424E-01	0.000E+00	4.715E+00
2.811158E-01	9.88851E+00	2.2755E+00	1.4816E+04	8.2844E-01	0.000E+00	4.410E+00
3.005128E-01	9.89698E+00	2.0722E+00	1.2621E+04	8.9444E-01	0.000E+00	4.126E+00
3.212482E-01	9.89457E+00	1.8846E+00	1.0738E+04	9.6185E-01	0.000E+00	3.859E+00
3.434143E-01	9.88287E+00	1.7121E+00	9.1255E+03	1.0303E+00	0.000E+00	3.610E+00
3.671099E-01	9.86321E+00	1.5539E+00	7.7474E+03	1.0993E+00	0.000E+00	3.377E+00
3.924405E-01	9.83660E+00	1.4090E+00	6.5718E+03	1.1684E+00	0.000E+00	3.159E+00
4.195189E-01	9.80379E+00	1.2767E+00	5.5704E+03	1.2372E+00	0.000E+00	2.955E+00
4.484657E-01	9.76525E+00	1.1561E+00	4.7186E+03	1.3050E+00	0.000E+00	2.765E+00
4.794098E-01	9.72113E+00	1.0463E+00	3.9948E+03	1.3714E+00	0.000E+00	2.586E+00
5.124891E-01	9.67130E+00	9.4647E-01	3.3804E+03	1.4359E+00	0.000E+00	2.419E+00
5.478508E-01	9.61523E+00	8.5583E-01	2.8594E+03	1.4979E+00	0.000E+00	2.263E+00
5.856525E-01	9.55196E+00	7.7342E-01	2.4172E+03	1.5569E+00	0.000E+00	2.117E+00
6.260625E-01	9.47867E+00	6.9457E-01	2.0307E+03	1.6125E+00	0.000E+00	1.980E+00
6.692609E-01	9.39178E+00	6.2355E-01	1.7054E+03	1.6642E+00	0.000E+00	1.853E+00
7.154399E-01	9.28740E+00	5.5968E-01	1.4319E+03	1.7115E+00	0.000E+00	1.733E+00
7.648052E-01	9.15862E+00	5.0234E-01	1.2022E+03	1.7542E+00	0.000E+00	1.621E+00
8.175768E-01	8.99314E+00	4.5092E-01	1.0095E+03	1.7917E+00	0.000E+00	1.516E+00
8.739896E-01	8.76706E+00	4.0486E-01	8.4790E+02	1.8239E+00	0.000E+00	1.419E+00
9.342948E-01	8.42597E+00	3.6364E-01	7.1240E+02	1.8505E+00	0.000E+00	1.327E+00
9.987612E-01	7.9970E+00	3.2676E-01	5.9884E+02	1.8714E+00	0.000E+00	1.241E+00
1.050658E+00	6.52412E+00	2.9882E-01	5.2058E+02	1.8832E+00	0.000E+00	1.180E+00
1.067676E+00	4.91181E+00	2.9049E-01	4.9801E+02	1.8863E+00	0.000E+00	1.161E+00
1.071028E+00	3.52095E+00	2.8890E-01	4.9373E+02	1.8869E+00	0.000E+00	1.158E+00
1.077461E+00	4.89062E+00	3.3468E+00	5.6855E+03	1.8879E+00	5.200E+03	1.151E+00
1.093542E+00	6.12496E+00	3.6044E+00	6.0331E+03	1.8902E+00	5.567E+03	1.134E+00
1.141345E+00	7.70749E+00	4.2220E+00	6.7709E+03	1.8953E+00	6.356E+03	1.086E+00
1.220098E+00	9.32686E+00	4.0897E+00	6.1354E+03	1.8984E+00	5.791E+03	1.016E+00
1.304285E+00	1.02655E+01	3.5285E+00	4.9517E+03	1.8955E+00	4.667E+03	9.506E-01
1.394281E+00	1.06769E+01	2.9168E+00	3.8291E+03	1.8869E+00	3.593E+03	8.892E-01
1.490486E+00	1.08500E+01	2.5451E+00	3.1255E+03	1.8727E+00	2.930E+03	8.318E-01
1.593329E+00	1.09680E+01	2.2568E+00	2.5926E+03	1.8532E+00	2.430E+03	7.781E-01
1.703269E+00	1.10540E+01	2.0296E+00	2.1810E+03	1.8285E+00	2.046E+03	7.279E-01
1.820795E+00	1.11263E+01	1.8413E+00	1.8510E+03	1.7989E+00	1.739E+03	6.809E-01
1.946430E+00	1.11914E+01	1.6757E+00	1.5758E+03	1.7650E+00	1.483E+03	6.370E-01
2.080733E+00	1.12505E+01	1.5228E+00	1.3396E+03	1.7269E+00	1.262E+03	5.959E-01
2.224304E+00	1.13511E+01	1.3668E+00	1.1248E+03	1.6851E+00	1.060E+03	5.574E-01
2.377781E+00	1.13777E+01	1.2171E+00	9.3691E+02	1.6400E+00	8.833E+02	5.214E-01
2.541848E+00	1.13894E+01	1.0838E+00	7.8044E+02	1.5920E+00	7.357E+02	4.878E-01
2.717235E+00	1.13918E+01	9.6513E-01	6.5013E+02	1.5416E+00	6.128E+02	4.563E-01
2.904724E+00	1.13880E+01	8.5948E-01	5.4160E+02	1.4891E+00	5.105E+02	4.268E-01
3.105150E+00	1.13852E+01	7.6236E-01	4.4939E+02	1.4351E+00	4.236E+02	3.993E-01
3.319406E+00	1.13721E+01	6.7370E-01	3.7149E+02	1.3799E+00	3.504E+02	3.735E-01
3.548445E+00	1.13556E+01	5.9538E-01	3.0711E+02	1.3238E+00	2.898E+02	3.494E-01
3.793288E+00	1.13373E+01	5.2617E-01	2.5390E+02	1.2674E+00	2.397E+02	3.269E-01
4.055024E+00	1.13182E+01	4.6503E-01	2.0991E+02	1.2110E+00	1.983E+02	3.058E-01
4.334821E+00	1.12991E+01	4.1100E-01	1.7355E+02	1.1548E+00	1.640E+02	2.860E-01
4.633924E+00	1.12804E+01	3.6326E-01	1.4349E+02	1.0993E+00	1.356E+02	2.676E-01
4.953664E+00	1.12619E+01	3.1883E-01	1.1781E+02	1.0446E+00	1.113E+02	2.503E-01
5.295467E+00	1.12430E+01	2.7975E-01	9.6698E+01	9.9105E-01	9.138E+01	2.341E-01
5.660855E+00	1.12245E+01	2.4548E-01	7.9372E+01	9.3888E-01	7.500E+01	2.190E-01
6.051453E+00	1.12068E+01	2.1540E-01	6.5153E+01	8.8826E-01	6.155E+01	2.049E-01
6.469004E+00	1.11899E+01	1.8902E-01	5.3482E+01	8.3936E-01	5.052E+01	1.917E-01
6.915365E+00	1.11740E+01	1.6587E-01	4.3902E+01	7.9232E-01	4.146E+01	1.793E-01
7.392525E+00	1.11591E+01	1.4555E-01	3.6039E+01	7.4724E-01	3.403E+01	1.677E-01
7.902609E+00	1.11453E+01	1.2773E-01	2.9585E+01	7.0420E-01	2.793E+01	1.569E-01
8.447890E+00	1.11325E+01	1.1209E-01	2.4287E+01	6.6327E-01	2.292E+01	1.468E-01
9.030794E+00	1.11217E+01	9.8173E-02	1.9898E+01	6.2448E-01	1.877E+01	1.373E-01
9.653919E+00	1.11112E+01	8.5365E-02	1.6185E+01	5.8783E-01	1.527E+01	1.284E-01
1.032004E+01	1.11009E+01	7.4228E-02	1.3165E+01	5.5333E-01	1.242E+01	1.201E-01
1.103212E+01	1.10913E+01	6.4546E-02	1.0709E+01	5.2095E-01	1.011E+01	1.124E-01
1.179334E+01	1.10825E+01	5.6127E-02	8.7112E+00	4.9065E-01	8.220E+00	1.051E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	$\mu\kappa$ cm ² /g	λ nm
1.260708E+01	1.10744E+01	4.8806E-02	7.0861E+00	4.6237E-01	6.686E+00	9.834E-02
1.347697E+01	1.10671E+01	4.2441E-02	5.7642E+00	4.3606E-01	5.439E+00	9.200E-02
1.440688E+01	1.10604E+01	3.6907E-02	4.6890E+00	4.1165E-01	4.424E+00	8.606E-02
1.540095E+01	1.10543E+01	3.2094E-02	3.8143E+00	3.8904E-01	3.599E+00	8.050E-02
1.646362E+01	1.10487E+01	2.7909E-02	3.1029E+00	3.6816E-01	2.927E+00	7.531E-02
1.759961E+01	1.10438E+01	2.4270E-02	2.5241E+00	3.4891E-01	2.381E+00	7.045E-02
1.881398E+01	1.10393E+01	2.1106E-02	2.0533E+00	3.3119E-01	1.937E+00	6.590E-02
2.011215E+01	1.10352E+01	1.8354E-02	1.6704E+00	3.1493E-01	1.576E+00	6.165E-02
2.149988E+01	1.10315E+01	1.5961E-02	1.3589E+00	3.0001E-01	1.282E+00	5.767E-02
2.298338E+01	1.10283E+01	1.3875E-02	1.1050E+00	2.8634E-01	1.042E+00	5.395E-02
2.456923E+01	1.10253E+01	1.2014E-02	8.9501E-01	2.7384E-01	8.438E-01	5.046E-02
2.626450E+01	1.10226E+01	1.0402E-02	7.2491E-01	2.6240E-01	6.832E-01	4.721E-02
2.807676E+01	1.10202E+01	8.9800E-03	5.8543E-01	2.5194E-01	5.515E-01	4.416E-02
3.001405E+01	1.10181E+01	7.7433E-03	4.7222E-01	2.4237E-01	4.447E-01	4.131E-02
3.208507E+01	1.10161E+01	6.6761E-03	3.8086E-01	2.3361E-01	3.586E-01	3.864E-02
3.429889E+01	1.10143E+01	5.7560E-03	3.0717E-01	2.2559E-01	2.892E-01	3.615E-02
3.666551E+01	1.10128E+01	4.9627E-03	2.4775E-01	2.1823E-01	2.332E-01	3.381E-02
3.919543E+01	1.10114E+01	4.2788E-03	1.9982E-01	2.1147E-01	1.881E-01	3.163E-02
4.189992E+01	1.10101E+01	3.6891E-03	1.6116E-01	2.0523E-01	1.517E-01	2.959E-02
4.479101E+01	1.10090E+01	3.1807E-03	1.2998E-01	1.9946E-01	1.223E-01	2.768E-02
4.788159E+01	1.10080E+01	2.7424E-03	1.0484E-01	1.9410E-01	9.865E-02	2.589E-02
5.118542E+01	1.10071E+01	2.3645E-03	8.4554E-02	1.8912E-01	7.955E-02	2.422E-02
5.471721E+01	1.10063E+01	2.0387E-03	6.8197E-02	1.8445E-01	6.416E-02	2.266E-02
5.849270E+01	1.10056E+01	1.7577E-03	5.5004E-02	1.8006E-01	5.174E-02	2.120E-02
6.252870E+01	1.10049E+01	1.5155E-03	4.4364E-02	1.7591E-01	4.172E-02	1.983E-02
6.684318E+01	1.10044E+01	1.3067E-03	3.5782E-02	1.7196E-01	3.365E-02	1.855E-02
7.145536E+01	1.10039E+01	1.1267E-03	2.8860E-02	1.6820E-01	2.713E-02	1.735E-02
7.638578E+01	1.10034E+01	9.7142E-04	2.3278E-02	1.6458E-01	2.188E-02	1.623E-02
8.165640E+01	1.10030E+01	8.3757E-04	1.8775E-02	1.6110E-01	1.765E-02	1.518E-02
8.729069E+01	1.10027E+01	7.2216E-04	1.5143E-02	1.5772E-01	1.423E-02	1.420E-02
9.331374E+01	1.10024E+01	6.2266E-04	1.2214E-02	1.5443E-01	1.148E-02	1.329E-02
9.975239E+01	1.10021E+01	5.3687E-04	9.8513E-03	1.5121E-01	9.255E-03	1.243E-02
1.066353E+02	1.10019E+01	4.6290E-04	7.9457E-03	1.4806E-01	7.464E-03	1.163E-02
1.139931E+02	1.10016E+01	3.9913E-04	6.4088E-03	1.4496E-01	6.019E-03	1.088E-02
1.218587E+02	1.10015E+01	3.4414E-04	5.1691E-03	1.4191E-01	4.854E-03	1.017E-02
1.302669E+02	1.10013E+01	2.9672E-04	4.1693E-03	1.3889E-01	3.914E-03	9.518E-03
1.392553E+02	1.10011E+01	2.5584E-04	3.3628E-03	1.3590E-01	3.157E-03	8.903E-03
1.488640E+02	1.10010E+01	2.2060E-04	2.7124E-03	1.3294E-01	2.546E-03	8.329E-03
1.591356E+02	1.10009E+01	1.9020E-04	2.1877E-03	1.3000E-01	2.053E-03	7.791E-03
1.701159E+02	1.10008E+01	1.6400E-04	1.7646E-03	1.2708E-01	1.656E-03	7.288E-03
1.818539E+02	1.10007E+01	1.4141E-04	1.4233E-03	1.2418E-01	1.335E-03	6.818E-03
1.944018E+02	1.10006E+01	1.2193E-04	1.1480E-03	1.2130E-01	1.077E-03	6.378E-03
2.078156E+02	1.10005E+01	1.0513E-04	9.2595E-04	1.1844E-01	8.683E-04	5.966E-03
2.221548E+02	1.10005E+01	9.0646E-05	7.4686E-04	1.1561E-01	7.002E-04	5.581E-03
2.374835E+02	1.10004E+01	7.8159E-05	6.0240E-04	1.1279E-01	5.647E-04	5.221E-03
2.538699E+02	1.10004E+01	6.7391E-05	4.8589E-04	1.1000E-01	4.554E-04	4.884E-03
2.713869E+02	1.10003E+01	5.8108E-05	3.9191E-04	1.0723E-01	3.672E-04	4.569E-03
2.901126E+02	1.10003E+01	5.0103E-05	3.1611E-04	1.0448E-01	2.962E-04	4.274E-03
3.101304E+02	1.10002E+01	4.3201E-05	2.5497E-04	1.0177E-01	2.388E-04	3.998E-03
3.315294E+02	1.10002E+01	3.7250E-05	2.0566E-04	9.9087E-02	1.926E-04	3.740E-03
3.544049E+02	1.10002E+01	3.2118E-05	1.6588E-04	9.6437E-02	1.553E-04	3.498E-03
3.788588E+02	1.10002E+01	2.7694E-05	1.3380E-04	9.3822E-02	1.253E-04	3.273E-03
4.050001E+02	1.10001E+01	2.3879E-05	1.0792E-04	9.1244E-02	1.010E-04	3.061E-03
4.329451E+02	1.10001E+01	2.0590E-05	8.7048E-05	8.8704E-02	8.146E-05	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 139

Mg Z = 12

Atomic weight = 2.430500E+01 g/mol, nominal density ρ (g/cm³) = 1.7350E+00

μ_a (barns/atom) = μ (cm²/g) \times 4.03594E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.73134E+06

4 edges. Edge energies (keV):

K 1.30500E+00 L I 8.94000E-02 L II 5.14000E-02 L III 5.14000E-02
 Relativistic correction estimate f_{rel} (I182,3/5CL) = -1.8616E-02, -1.0800E-02 e/atom
 Nuclear Thomson correction f_{NT} = -3.2502E-03 e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	2.46798E+00	0.0000E+00	0.0000E+00	9.8483E-05	0.000E+00	1.160E+02
1.142761E-02	2.45703E+00	0.0000E+00	0.0000E+00	1.3394E-04	0.000E+00	1.085E+02
1.221612E-02	2.44446E+00	0.0000E+00	0.0000E+00	1.8114E-04	0.000E+00	1.015E+02
1.305903E-02	2.42999E+00	0.0000E+00	0.0000E+00	2.4362E-04	0.000E+00	9.494E+01
1.396010E-02	2.41334E+00	0.0000E+00	0.0000E+00	3.2583E-04	0.000E+00	8.881E+01
1.492335E-02	2.39414E+00	0.0000E+00	0.0000E+00	4.3340E-04	0.000E+00	8.308E+01
1.595306E-02	2.37197E+00	0.0000E+00	0.0000E+00	5.7333E-04	0.000E+00	7.772E+01
1.705382E-02	2.34635E+00	0.0000E+00	0.0000E+00	7.5433E-04	0.000E+00	7.270E+01
1.823053E-02	2.31667E+00	0.0000E+00	0.0000E+00	9.8712E-04	0.000E+00	6.801E+01
1.948844E-02	2.28222E+00	0.0000E+00	0.0000E+00	1.2848E-03	0.000E+00	6.362E+01
2.083314E-02	2.24214E+00	0.0000E+00	0.0000E+00	1.6635E-03	0.000E+00	5.951E+01
2.227063E-02	2.19535E+00	0.0000E+00	0.0000E+00	2.1423E-03	0.000E+00	5.567E+01
2.380730E-02	2.14053E+00	0.0000E+00	0.0000E+00	2.7446E-03	0.000E+00	5.208E+01
2.545001E-02	2.07604E+00	0.0000E+00	0.0000E+00	3.4978E-03	0.000E+00	4.872E+01
2.720606E-02	1.99976E+00	0.0000E+00	0.0000E+00	4.4347E-03	0.000E+00	4.557E+01
2.908327E-02	1.90893E+00	0.0000E+00	0.0000E+00	5.5937E-03	0.000E+00	4.263E+01
3.109002E-02	1.79989E+00	0.0000E+00	0.0000E+00	7.0197E-03	0.000E+00	3.988E+01
3.323523E-02	1.66760E+00	0.0000E+00	0.0000E+00	8.7645E-03	0.000E+00	3.731E+01
3.552846E-02	1.50483E+00	0.0000E+00	0.0000E+00	1.0888E-02	0.000E+00	3.490E+01
3.797993E-02	1.30071E+00	0.0000E+00	0.0000E+00	1.3458E-02	0.000E+00	3.264E+01
4.060054E-02	1.03750E+00	0.0000E+00	0.0000E+00	1.6553E-02	0.000E+00	3.054E+01
4.340198E-02	6.82720E-01	0.0000E+00	0.0000E+00	2.0260E-02	0.000E+00	2.857E+01
4.639671E-02	1.63175E-01	0.0000E+00	0.0000E+00	2.4675E-02	0.000E+00	2.672E+01
4.959809E-02	-7.94660E-01	0.0000E+00	0.0000E+00	2.9907E-02	0.000E+00	2.500E+01
5.037200E-02	-1.23235E+00	0.0000E+00	0.0000E+00	3.1250E-02	0.000E+00	2.461E+01
5.114300E-02	-2.14633E+00	0.0000E+00	0.0000E+00	3.2618E-02	0.000E+00	2.424E+01
5.134860E-02	-3.06571E+00	0.0000E+00	0.0000E+00	3.2988E-02	0.000E+00	2.415E+01
5.165700E-02	-2.31811E+00	1.7107E+00	5.7335E+04	3.3547E-02	0.000E+00	2.400E+01
5.242800E-02	-1.77102E+00	1.8464E+00	6.0975E+04	3.4964E-02	0.000E+00	2.365E+01
5.302035E-02	-1.65181E+00	1.9565E+00	6.3888E+04	3.6074E-02	0.000E+00	2.338E+01
5.667876E-02	-1.58097E+00	2.7595E+00	8.4293E+04	4.3304E-02	0.000E+00	2.187E+01
6.058959E-02	-1.51530E+00	3.7482E+00	1.0711E+05	5.1737E-02	0.000E+00	2.046E+01
6.477028E-02	-1.24345E+00	4.7712E+00	1.2754E+05	6.1522E-02	0.000E+00	1.914E+01
6.923942E-02	-7.50020E-01	5.7446E+00	1.4365E+05	7.2816E-02	0.000E+00	1.791E+01
7.401695E-02	-6.57205E-02	6.5956E+00	1.5428E+05	8.5784E-02	0.000E+00	1.675E+01
7.912411E-02	7.45736E-01	7.2727E+00	1.5914E+05	1.0060E-01	0.000E+00	1.567E+01
8.458368E-02	1.57760E+00	7.7495E+00	1.5862E+05	1.1743E-01	0.000E+00	1.466E+01
8.761200E-02	1.91414E+00	7.9183E+00	1.5648E+05	1.2718E-01	0.000E+00	1.415E+01
8.895300E-02	1.87327E+00	7.9741E+00	1.5520E+05	1.3158E-01	0.000E+00	1.394E+01
8.931060E-02	1.62388E+00	7.9871E+00	1.5483E+05	1.3276E-01	0.000E+00	1.388E+01
8.984700E-02	2.01523E+00	8.6080E+00	1.6588E+05	1.3455E-01	0.000E+00	1.380E+01
9.041995E-02	2.26495E+00	8.6311E+00	1.6527E+05	1.3646E-01	0.000E+00	1.371E+01
9.118800E-02	2.49637E+00	8.6592E+00	1.6441E+05	1.3904E-01	0.000E+00	1.360E+01
9.665893E-02	3.62633E+00	8.7766E+00	1.5720E+05	1.5786E-01	0.000E+00	1.283E+01
1.033284E-01	4.71331E+00	8.7615E+00	1.4681E+05	1.8180E-01	0.000E+00	1.200E+01
1.104581E-01	5.69293E+00	8.6076E+00	1.3492E+05	2.0846E-01	0.000E+00	1.122E+01
1.180797E-01	6.56897E+00	8.3455E+00	1.2237E+05	2.3797E-01	0.000E+00	1.050E+01
1.262272E-01	7.34102E+00	8.0043E+00	1.0979E+05	2.7048E-01	0.000E+00	9.822E+00
1.349368E-01	8.01184E+00	7.6096E+00	9.7637E+04	3.0611E-01	0.000E+00	9.188E+00
1.442475E-01	8.58744E+00	7.1826E+00	8.6210E+04	3.4495E-01	0.000E+00	8.595E+00
1.542005E-01	9.07657E+00	6.7401E+00	7.5677E+04	3.8707E-01	0.000E+00	8.040E+00
1.648404E-01	9.48729E+00	6.2947E+00	6.6114E+04	4.3251E-01	0.000E+00	7.521E+00
1.762144E-01	9.82965E+00	5.8557E+00	5.7534E+04	4.8128E-01	0.000E+00	7.036E+00
1.883732E-01	1.01128E+01	5.4298E+00	4.9905E+04	5.3333E-01	0.000E+00	6.582E+00

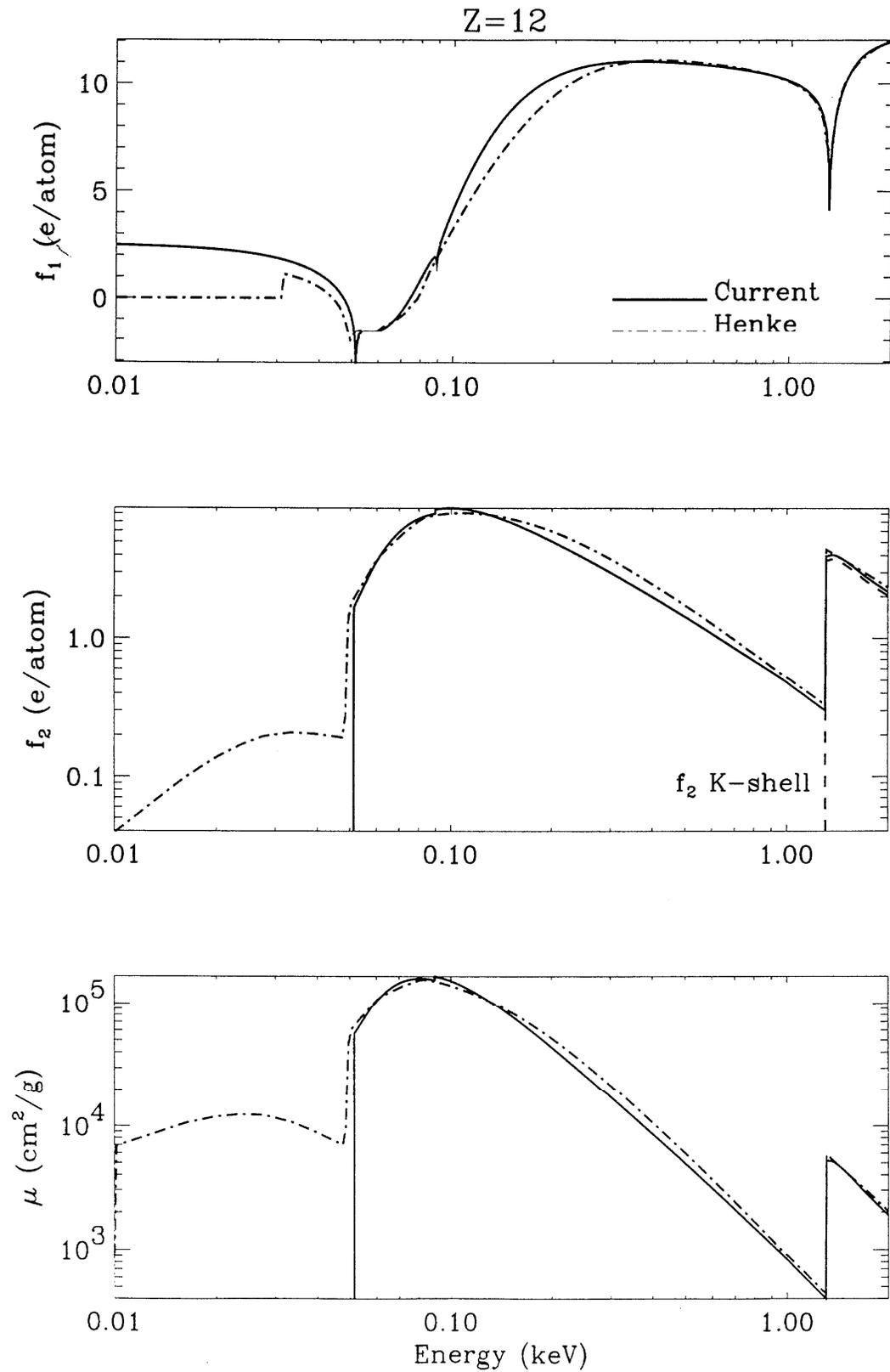
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

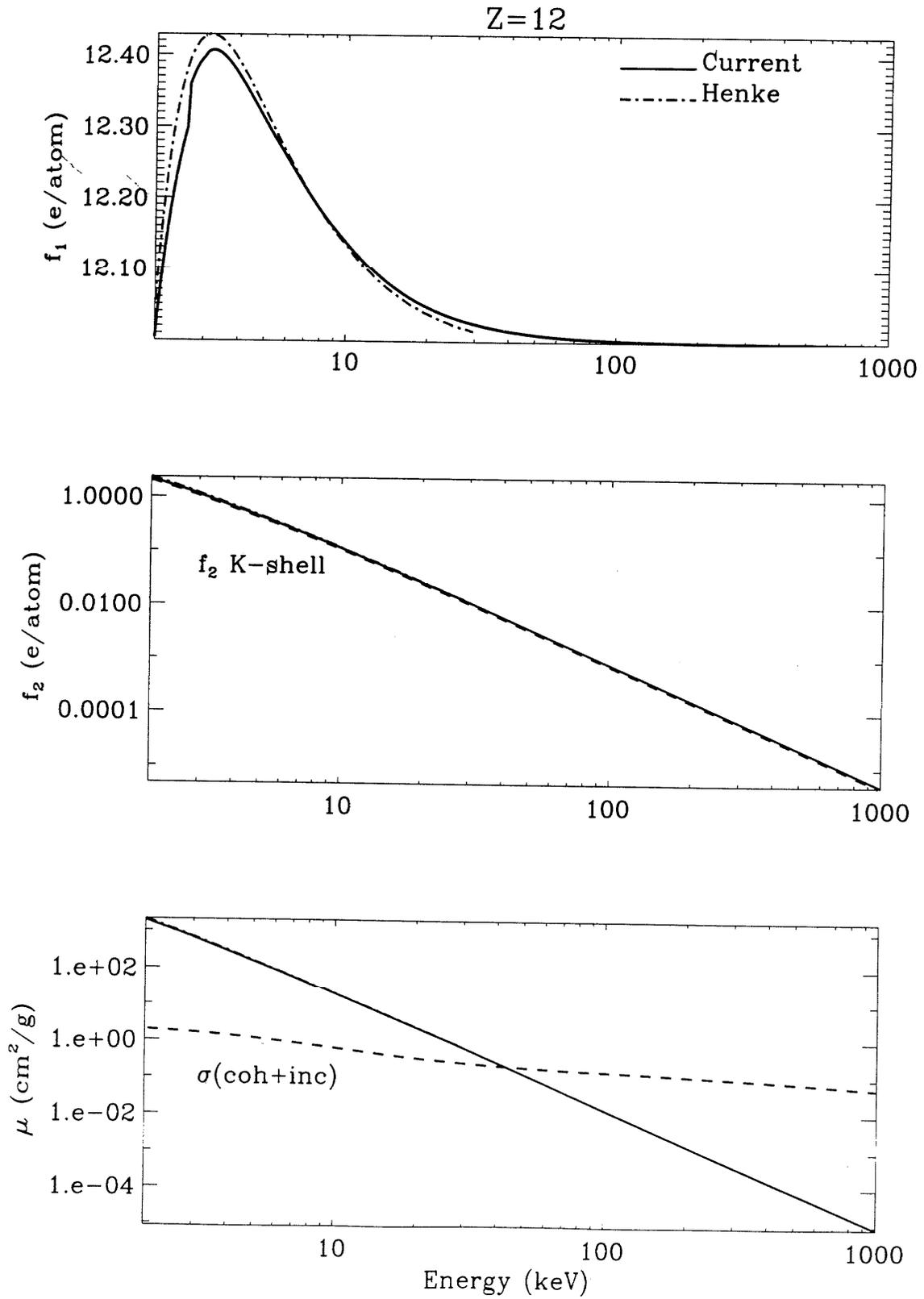
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh} + \text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.013709E-01	1.03452E+01	5.0212E+00	4.3171E+04	5.8860E-01	0.000E+00	6.157E+00
2.152655E-01	1.05347E+01	4.6320E+00	3.7254E+04	6.4696E-01	0.000E+00	5.760E+00
2.301188E-01	1.06868E+01	4.2624E+00	3.2069E+04	7.0825E-01	0.000E+00	5.388E+00
2.459970E-01	1.08064E+01	3.9136E+00	2.7544E+04	7.7226E-01	0.000E+00	5.040E+00
2.629708E-01	1.08979E+01	3.5864E+00	2.3612E+04	8.3873E-01	0.000E+00	4.715E+00
2.811158E-01	1.09658E+01	3.2807E+00	2.0205E+04	9.0737E-01	0.000E+00	4.410E+00
3.005128E-01	1.10131E+01	2.9961E+00	1.7262E+04	9.7782E-01	0.000E+00	4.126E+00
3.212482E-01	1.10431E+01	2.7321E+00	1.4725E+04	1.0497E+00	0.000E+00	3.859E+00
3.434143E-01	1.10586E+01	2.4878E+00	1.2543E+04	1.1226E+00	0.000E+00	3.610E+00
3.671099E-01	1.10617E+01	2.2623E+00	1.0670E+04	1.1960E+00	0.000E+00	3.377E+00
3.924405E-01	1.10544E+01	2.0544E+00	9.0633E+03	1.2695E+00	0.000E+00	3.159E+00
4.195189E-01	1.10378E+01	1.8629E+00	7.6882E+03	1.3425E+00	0.000E+00	2.955E+00
4.484657E-01	1.10132E+01	1.6872E+00	6.5135E+03	1.4146E+00	0.000E+00	2.765E+00
4.794098E-01	1.09815E+01	1.5262E+00	5.5118E+03	1.4851E+00	0.000E+00	2.586E+00
5.124891E-01	1.09433E+01	1.3791E+00	4.6591E+03	1.5536E+00	0.000E+00	2.419E+00
5.478508E-01	1.08992E+01	1.2450E+00	3.9346E+03	1.6195E+00	0.000E+00	2.263E+00
5.856525E-01	1.08494E+01	1.1230E+00	3.3200E+03	1.6823E+00	0.000E+00	2.117E+00
6.260625E-01	1.07938E+01	1.0123E+00	2.7993E+03	1.7415E+00	0.000E+00	1.980E+00
6.692609E-01	1.07317E+01	9.1188E-01	2.3590E+03	1.7966E+00	0.000E+00	1.853E+00
7.154399E-01	1.06624E+01	8.2108E-01	1.9870E+03	1.8471E+00	0.000E+00	1.733E+00
7.648052E-01	1.05839E+01	7.3909E-01	1.6731E+03	1.8928E+00	0.000E+00	1.621E+00
8.175768E-01	1.04938E+01	6.6515E-01	1.4086E+03	1.9331E+00	0.000E+00	1.516E+00
8.739896E-01	1.03877E+01	5.9857E-01	1.1858E+03	1.9679E+00	0.000E+00	1.419E+00
9.342948E-01	1.02587E+01	5.3870E-01	9.9826E+02	1.9968E+00	0.000E+00	1.327E+00
9.987612E-01	1.00942E+01	4.8399E-01	8.3899E+02	2.0197E+00	0.000E+00	1.241E+00
1.067676E+00	9.86553E+00	4.2897E-01	6.9561E+02	2.0364E+00	0.000E+00	1.161E+00
1.141345E+00	9.51607E+00	3.8061E-01	5.7737E+02	2.0469E+00	0.000E+00	1.086E+00
1.220098E+00	8.85649E+00	3.3816E-01	4.7985E+02	2.0512E+00	0.000E+00	1.016E+00
1.278900E+00	7.57149E+00	3.1133E-01	4.2147E+02	2.0505E+00	0.000E+00	9.695E-01
1.298475E+00	5.98525E+00	3.0318E-01	4.0425E+02	2.0496E+00	0.000E+00	9.548E-01
1.304285E+00	3.41984E+00	3.0083E-01	3.9932E+02	2.0493E+00	0.000E+00	9.506E-01
1.311525E+00	5.92695E+00	3.9592E+00	5.2265E+03	2.0488E+00	4.833E+03	9.453E-01
1.331100E+00	7.57432E+00	3.9913E+00	5.1915E+03	2.0475E+00	4.814E+03	9.314E-01
1.394281E+00	9.30219E+00	3.9993E+00	4.9661E+03	2.0413E+00	4.633E+03	8.892E-01
1.490486E+00	1.04949E+01	3.6712E+00	4.2645E+03	2.0273E+00	3.987E+03	8.318E-01
1.593329E+00	1.11690E+01	3.2546E+00	3.5365E+03	2.0077E+00	3.305E+03	7.781E-01
1.703269E+00	1.15495E+01	2.8511E+00	2.8981E+03	1.9826E+00	2.705E+03	7.279E-01
1.820795E+00	1.17834E+01	2.5397E+00	2.4149E+03	1.9524E+00	2.254E+03	6.809E-01
1.946430E+00	1.19494E+01	2.2732E+00	2.0220E+03	1.9174E+00	1.889E+03	6.370E-01
2.080733E+00	1.20708E+01	2.0422E+00	1.6993E+03	1.8779E+00	1.589E+03	5.959E-01
2.224304E+00	1.21624E+01	1.8378E+00	1.4305E+03	1.8344E+00	1.339E+03	5.574E-01
2.377781E+00	1.22323E+01	1.6539E+00	1.2042E+03	1.7873E+00	1.128E+03	5.214E-01
2.541848E+00	1.22852E+01	1.4866E+00	1.0126E+03	1.7371E+00	9.490E+02	4.878E-01
2.717235E+00	1.23707E+01	1.3291E+00	8.4687E+02	1.6840E+00	7.939E+02	4.563E-01
2.904724E+00	1.23918E+01	1.1850E+00	7.0629E+02	1.6287E+00	6.622E+02	4.268E-01
3.105150E+00	1.24049E+01	1.0522E+00	5.8670E+02	1.5716E+00	5.503E+02	3.993E-01
3.319406E+00	1.24053E+01	9.3089E-01	4.8554E+02	1.5130E+00	4.557E+02	3.735E-01
3.548445E+00	1.23973E+01	8.2358E-01	4.0184E+02	1.4534E+00	3.773E+02	3.494E-01
3.793288E+00	1.23843E+01	7.2867E-01	3.3258E+02	1.3931E+00	3.125E+02	3.269E-01
4.055024E+00	1.23682E+01	6.4473E-01	2.7527E+02	1.3327E+00	2.587E+02	3.058E-01
4.334821E+00	1.23501E+01	5.7048E-01	2.2785E+02	1.2724E+00	2.143E+02	2.860E-01
4.633924E+00	1.23310E+01	5.0479E-01	1.8860E+02	1.2125E+00	1.774E+02	2.676E-01
4.953664E+00	1.23116E+01	4.4669E-01	1.5612E+02	1.1535E+00	1.469E+02	2.503E-01
5.295467E+00	1.22924E+01	3.9528E-01	1.2924E+02	1.0954E+00	1.217E+02	2.341E-01
5.660855E+00	1.22740E+01	3.4977E-01	1.0697E+02	1.0387E+00	1.007E+02	2.190E-01
6.051453E+00	1.22558E+01	3.0719E-01	8.7889E+01	9.8349E-01	8.275E+01	2.049E-01
6.469004E+00	1.22374E+01	2.6981E-01	7.2210E+01	9.2997E-01	6.797E+01	1.917E-01
6.915365E+00	1.22194E+01	2.3698E-01	5.9330E+01	8.7831E-01	5.583E+01	1.793E-01
7.392525E+00	1.22022E+01	2.0815E-01	4.8749E+01	8.2864E-01	4.586E+01	1.677E-01
7.902609E+00	1.21860E+01	1.8283E-01	4.0055E+01	7.8105E-01	3.767E+01	1.569E-01
8.447890E+00	1.21710E+01	1.6060E-01	3.2913E+01	7.3564E-01	3.095E+01	1.468E-01
9.030794E+00	1.21570E+01	1.4079E-01	2.6991E+01	6.9243E-01	2.537E+01	1.373E-01
9.653919E+00	1.21436E+01	1.2254E-01	2.1977E+01	6.5148E-01	2.066E+01	1.284E-01
1.032004E+01	1.21308E+01	1.0666E-01	1.7894E+01	6.1277E-01	1.682E+01	1.201E-01
1.103212E+01	1.21189E+01	9.2844E-02	1.4571E+01	5.7631E-01	1.370E+01	1.124E-01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 141

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.179334E+01	1.21078E+01	8.0816E-02	1.1864E+01	5.4206E-01	1.115E+01	1.051E-01
1.260708E+01	1.20976E+01	7.0348E-02	9.6609E+00	5.0999E-01	9.082E+00	9.834E-02
1.347697E+01	1.20882E+01	6.1236E-02	7.8668E+00	4.8003E-01	7.395E+00	9.200E-02
1.440688E+01	1.20796E+01	5.3306E-02	6.4060E+00	4.5211E-01	6.022E+00	8.606E-02
1.540095E+01	1.20718E+01	4.6403E-02	5.2165E+00	4.2618E-01	4.903E+00	8.050E-02
1.646362E+01	1.20646E+01	4.0394E-02	4.2479E+00	4.0213E-01	3.993E+00	7.531E-02
1.759961E+01	1.20581E+01	3.5164E-02	3.4592E+00	3.7988E-01	3.251E+00	7.045E-02
1.881398E+01	1.20522E+01	3.0611E-02	2.8170E+00	3.5934E-01	2.647E+00	6.590E-02
2.011215E+01	1.20469E+01	2.6648E-02	2.2940E+00	3.4041E-01	2.156E+00	6.165E-02
2.149988E+01	1.20421E+01	2.3199E-02	1.8682E+00	3.2300E-01	1.755E+00	5.767E-02
2.298338E+01	1.20378E+01	2.0196E-02	1.5214E+00	3.0700E-01	1.479E+00	5.395E-02
2.456923E+01	1.20339E+01	1.7582E-02	1.2390E+00	2.9232E-01	1.164E+00	5.046E-02
2.626450E+01	1.20304E+01	1.5306E-02	1.0090E+00	2.7886E-01	9.477E-01	4.721E-02
2.807676E+01	1.20272E+01	1.3269E-02	8.1823E-01	2.6653E-01	7.685E-01	4.416E-02
3.001405E+01	1.20244E+01	1.1454E-02	6.6071E-01	2.5525E-01	6.203E-01	4.131E-02
3.208502E+01	1.20218E+01	9.8871E-03	5.3352E-01	2.4491E-01	5.008E-01	3.864E-02
3.429889E+01	1.20195E+01	8.5347E-03	4.3082E-01	2.3544E-01	4.043E-01	3.615E-02
3.666551E+01	1.20174E+01	7.3674E-03	3.4789E-01	2.2675E-01	3.264E-01	3.381E-02
3.919543E+01	1.20155E+01	6.3597E-03	2.8092E-01	2.1878E-01	2.635E-01	3.163E-02
4.189992E+01	1.20138E+01	5.4892E-03	2.2682E-01	2.1145E-01	2.127E-01	2.959E-02
4.479101E+01	1.20123E+01	4.7372E-03	1.8311E-01	2.0470E-01	1.717E-01	2.768E-02
4.788159E+01	1.20109E+01	4.0882E-03	1.4783E-01	1.9845E-01	1.386E-01	2.589E-02
5.118542E+01	1.20097E+01	3.5282E-03	1.1934E-01	1.9267E-01	1.119E-01	2.422E-02
5.471721E+01	1.20086E+01	3.0449E-03	9.6344E-02	1.8729E-01	9.032E-02	2.266E-02
5.849270E+01	1.20077E+01	2.6278E-03	7.7780E-02	1.8226E-01	7.292E-02	2.120E-02
6.252870E+01	1.20068E+01	2.2678E-03	6.2793E-02	1.7754E-01	5.886E-02	1.983E-02
6.684318E+01	1.20060E+01	1.9572E-03	5.0693E-02	1.7310E-01	4.752E-02	1.855E-02
7.145536E+01	1.20053E+01	1.6891E-03	4.0926E-02	1.6889E-01	3.836E-02	1.735E-02
7.638578E+01	1.20047E+01	1.4577E-03	3.3040E-02	1.6488E-01	3.097E-02	1.623E-02
8.165640E+01	1.20042E+01	1.2580E-03	2.6674E-02	1.6105E-01	2.500E-02	1.518E-02
8.729069E+01	1.20037E+01	1.0857E-03	2.1534E-02	1.5737E-01	2.018E-02	1.420E-02
9.331374E+01	1.20033E+01	9.3701E-04	1.7385E-02	1.5381E-01	1.629E-02	1.329E-02
9.975239E+01	1.20029E+01	8.0867E-04	1.4036E-02	1.5036E-01	1.315E-02	1.243E-02
1.066353E+02	1.20026E+01	6.9791E-04	1.1331E-02	1.4701E-01	1.062E-02	1.163E-02
1.139931E+02	1.20023E+01	6.0232E-04	9.1482E-03	1.4372E-01	8.571E-03	1.088E-02
1.218587E+02	1.20020E+01	5.1983E-04	7.3856E-03	1.4050E-01	6.919E-03	1.017E-02
1.302669E+02	1.20018E+01	4.4863E-04	5.9627E-03	1.3733E-01	5.585E-03	9.518E-03
1.392553E+02	1.20016E+01	3.8719E-04	4.8139E-03	1.3420E-01	4.509E-03	8.903E-03
1.488640E+02	1.20014E+01	3.3416E-04	3.8864E-03	1.3111E-01	3.640E-03	8.329E-03
1.591356E+02	1.20012E+01	2.8839E-04	3.1376E-03	1.2805E-01	2.938E-03	7.791E-03
1.701159E+02	1.20011E+01	2.4890E-04	2.5331E-03	1.2502E-01	2.372E-03	7.288E-03
1.818539E+02	1.20010E+01	2.1481E-04	2.0451E-03	1.2201E-01	1.915E-03	6.818E-03
1.944018E+02	1.20008E+01	1.8539E-04	1.6511E-03	1.1903E-01	1.546E-03	6.378E-03
2.078156E+02	1.20007E+01	1.6000E-04	1.3330E-03	1.1606E-01	1.248E-03	5.966E-03
2.221548E+02	1.20007E+01	1.3809E-04	1.0762E-03	1.1311E-01	1.007E-03	5.581E-03
2.374835E+02	1.20006E+01	1.1918E-04	8.6886E-04	1.1018E-01	8.132E-04	5.221E-03
2.538699E+02	1.20005E+01	1.0286E-04	7.0147E-04	1.0728E-01	6.565E-04	4.884E-03
2.713869E+02	1.20005E+01	8.8772E-05	5.6633E-04	1.0439E-01	5.300E-04	4.569E-03
2.901126E+02	1.20004E+01	7.6615E-05	4.5722E-04	1.0152E-01	4.278E-04	4.274E-03
3.101304E+02	1.20004E+01	6.6123E-05	3.6914E-04	9.8684E-02	3.454E-04	3.998E-03
3.315294E+02	1.20003E+01	5.7068E-05	2.9802E-04	9.5869E-02	2.788E-04	3.740E-03
3.544049E+02	1.20003E+01	4.9253E-05	2.4061E-04	9.3083E-02	2.251E-04	3.498E-03
3.788588E+02	1.20002E+01	4.2508E-05	1.9426E-04	9.0326E-02	1.817E-04	3.273E-03
4.050001E+02	1.20002E+01	3.6687E-05	1.5683E-04	8.7602E-02	1.467E-04	3.061E-03
4.329451E+02	1.20002E+01	3.1663E-05	1.2662E-04	8.4913E-02	1.184E-04	2.864E-03





Al Z = 13

Atomic weight = 2.698150E+01 g/mol, nominal density ρ (g/cm³) = 2.6941E+00 μ_0 (barns/atom) = μ (cm²/g) \times 4.48039E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.55960E+06

5 edges. Edge energies (keV):

K 1.55960E+00 L I 1.17700E-00 L II 7.31000E-02 L III 7.31000E-02

M I 8.37567E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.2218E-02, -1.2600E-02 e/atomNuclear Thomson correction f_{NT} = -3.4361E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
8.208152E-03	3.11903E+00	0.0000E+00	0.0000E+00	3.6085E-05	0.000E+00	1.511E+02
8.333787E-03	3.07927E+00	0.0000E+00	0.0000E+00	3.8846E-05	0.000E+00	1.488E+02
8.367290E-03	3.02769E+00	0.0000E+00	0.0000E+00	3.9608E-05	0.000E+00	1.482E+02
8.417543E-03	3.08902E+00	1.0319E-01	1.9119E+04	4.0772E-05	0.000E+00	1.473E+02
8.543178E-03	3.14160E+00	9.0457E-02	1.6513E+04	4.3791E-05	0.000E+00	1.451E+02
1.069000E-02	3.16731E+00	1.8351E-02	2.6773E+03	1.2485E-04	0.000E+00	1.160E+02
1.142761E-02	3.15650E+00	1.5050E-02	2.0540E+03	1.6851E-04	0.000E+00	1.085E+02
1.221612E-02	3.14495E+00	1.3667E-02	1.7448E+03	2.2620E-04	0.000E+00	1.015E+02
1.305903E-02	3.13240E+00	1.3480E-02	1.6099E+03	3.0199E-04	0.000E+00	9.494E+01
1.396010E-02	3.11858E+00	1.4200E-02	1.5864E+03	4.0103E-04	0.000E+00	8.881E+01
1.492335E-02	3.10318E+00	1.5741E-02	1.6451E+03	5.2970E-04	0.000E+00	8.308E+01
1.595306E-02	3.08594E+00	1.8134E-02	1.7728E+03	6.9596E-04	0.000E+00	7.772E+01
1.705382E-02	3.06659E+00	2.1472E-02	1.9636E+03	9.0959E-04	0.000E+00	7.270E+01
1.823053E-02	3.04487E+00	2.5892E-02	2.2150E+03	1.1826E-03	0.000E+00	6.801E+01
1.948844E-02	3.02055E+00	3.1548E-02	2.5247E+03	1.5295E-03	0.000E+00	6.362E+01
2.083314E-02	2.99341E+00	3.8589E-02	2.8888E+03	1.9681E-03	0.000E+00	5.951E+01
2.227063E-02	2.96319E+00	4.7130E-02	3.3005E+03	2.5194E-03	0.000E+00	5.567E+01
2.380730E-02	2.92964E+00	5.7225E-02	3.7488E+03	3.2087E-03	0.000E+00	5.208E+01
2.545001E-02	2.89315E+00	6.8841E-02	4.2186E+03	4.0659E-03	0.000E+00	4.872E+01
2.720606E-02	2.85179E+00	8.1830E-02	4.6910E+03	5.1263E-03	0.000E+00	4.557E+01
2.908327E-02	2.80561E+00	9.5929E-02	5.1442E+03	6.4310E-03	0.000E+00	4.263E+01
3.109002E-02	2.75366E+00	1.1075E-01	5.5558E+03	8.0279E-03	0.000E+00	3.988E+01
3.323523E-02	2.69458E+00	1.2583E-01	5.9046E+03	9.9719E-03	0.000E+00	3.731E+01
3.552846E-02	2.62647E+00	1.4038E-01	6.1625E+03	1.2326E-02	0.000E+00	3.490E+01
3.797993E-02	2.54633E+00	1.5354E-01	6.3051E+03	1.5162E-02	0.000E+00	3.264E+01
4.060054E-02	2.45013E+00	1.6490E-01	6.3342E+03	1.8561E-02	0.000E+00	3.054E+01
4.340198E-02	2.33262E+00	1.7418E-01	6.2591E+03	2.2614E-02	0.000E+00	2.857E+01
4.639671E-02	2.18672E+00	1.8132E-01	6.0951E+03	2.7420E-02	0.000E+00	2.672E+01
4.959809E-02	2.00256E+00	1.8615E-01	5.8535E+03	3.3090E-02	0.000E+00	2.500E+01
5.302035E-02	1.76493E+00	1.8830E-01	5.5387E+03	3.9747E-02	0.000E+00	2.338E+01
5.667876E-02	1.44912E+00	1.8825E-01	5.1801E+03	4.7522E-02	0.000E+00	2.187E+01
6.058959E-02	1.01038E+00	1.8630E-01	4.7955E+03	5.6554E-02	0.000E+00	2.046E+01
6.477028E-02	3.49959E-01	1.8275E-01	4.4005E+03	6.6996E-02	0.000E+00	1.914E+01
6.923942E-02	-8.55994E-01	1.7794E-01	4.0081E+03	7.9006E-02	0.000E+00	1.791E+01
7.163800E-02	-2.25520E+00	1.7511E-01	3.8122E+03	8.5792E-02	0.000E+00	1.731E+01
7.273450E-02	-4.06506E+00	1.7377E-01	3.7261E+03	8.8971E-02	0.000E+00	1.705E+01
7.302690E-02	-6.02938E+00	1.7342E-01	3.7036E+03	8.9827E-02	0.000E+00	1.698E+01
7.346550E-02	-4.25024E+00	3.9275E+00	8.3378E+04	9.1116E-02	0.000E+00	1.688E+01
7.401695E-02	-3.26725E+00	4.0145E+00	8.4589E+04	9.2748E-02	0.000E+00	1.675E+01
7.456200E-02	-2.79918E+00	4.1018E+00	8.5797E+04	9.4372E-02	0.000E+00	1.663E+01
7.912411E-02	-1.53427E+00	4.8866E+00	9.6319E+04	1.0839E-01	0.000E+00	1.567E+01
8.458368E-02	-8.05339E-01	5.8791E+00	1.0840E+05	1.2612E-01	0.000E+00	1.466E+01
9.041995E-02	-1.06801E-02	6.7792E+00	1.1693E+05	1.4609E-01	0.000E+00	1.371E+01
9.665893E-02	8.82403E-01	7.5222E+00	1.2137E+05	1.6849E-01	0.000E+00	1.283E+01
1.033284E-01	1.83035E+00	8.0732E+00	1.2185E+05	1.9348E-01	0.000E+00	1.200E+01
1.104581E-01	2.73433E+00	8.4204E+00	1.1889E+05	2.2122E-01	0.000E+00	1.122E+01
1.153460E-01	3.13128E+00	8.5391E+00	1.1546E+05	2.4076E-01	0.000E+00	1.075E+01
1.171115E-01	2.99511E+00	8.5619E+00	1.1402E+05	2.4791E-01	0.000E+00	1.059E+01
1.175823E-01	2.62299E+00	8.5664E+00	1.1362E+05	2.4983E-01	0.000E+00	1.054E+01
1.180797E-01	3.00312E+00	9.4208E+00	1.2443E+05	2.5186E-01	0.000E+00	1.050E+01
1.182885E-01	3.14862E+00	9.4235E+00	1.2425E+05	2.5271E-01	0.000E+00	1.048E+01
1.200540E-01	3.75272E+00	9.4411E+00	1.2265E+05	2.5994E-01	0.000E+00	1.033E+01
1.262272E-01	4.87197E+00	9.4410E+00	1.1665E+05	2.8552E-01	0.000E+00	9.822E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 145

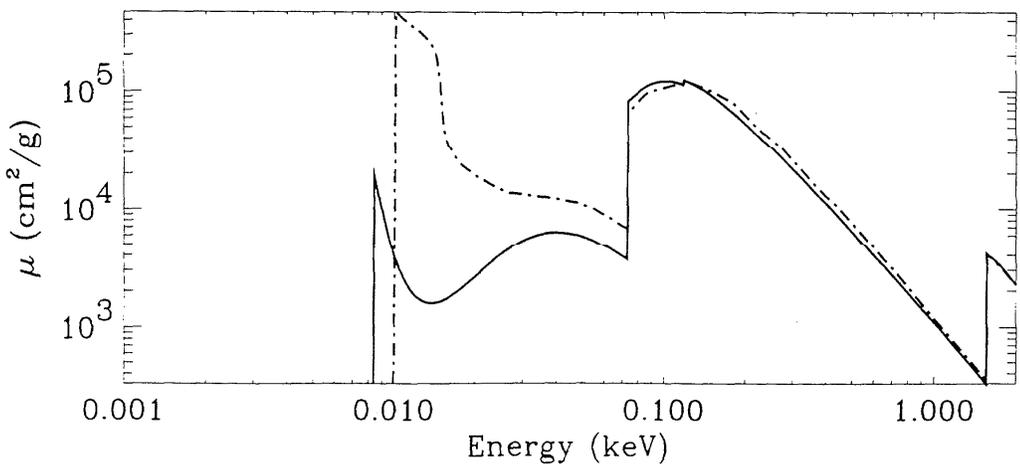
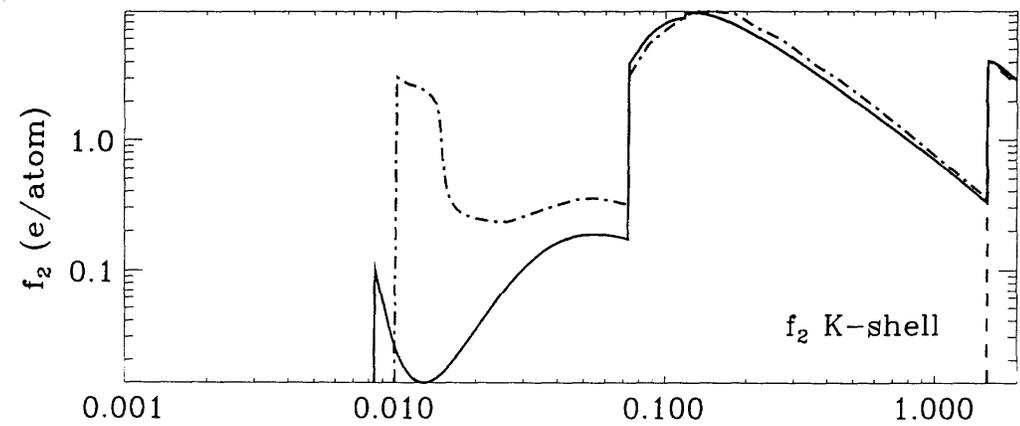
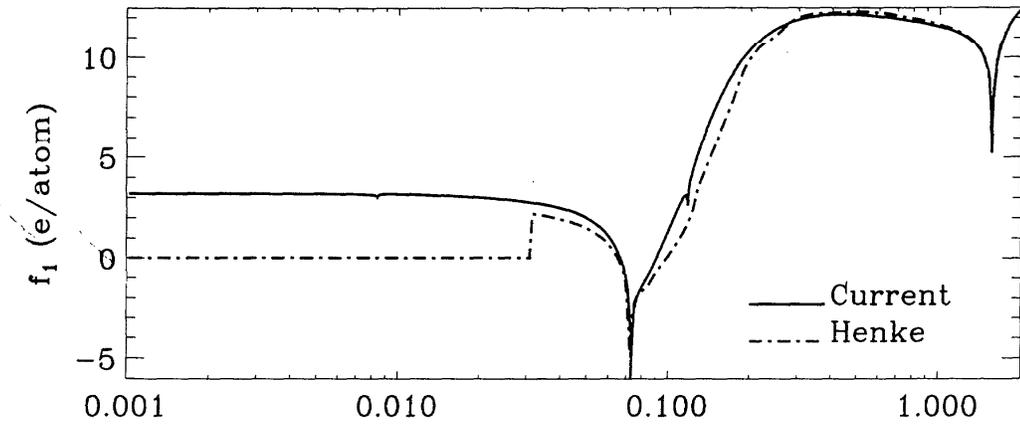
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

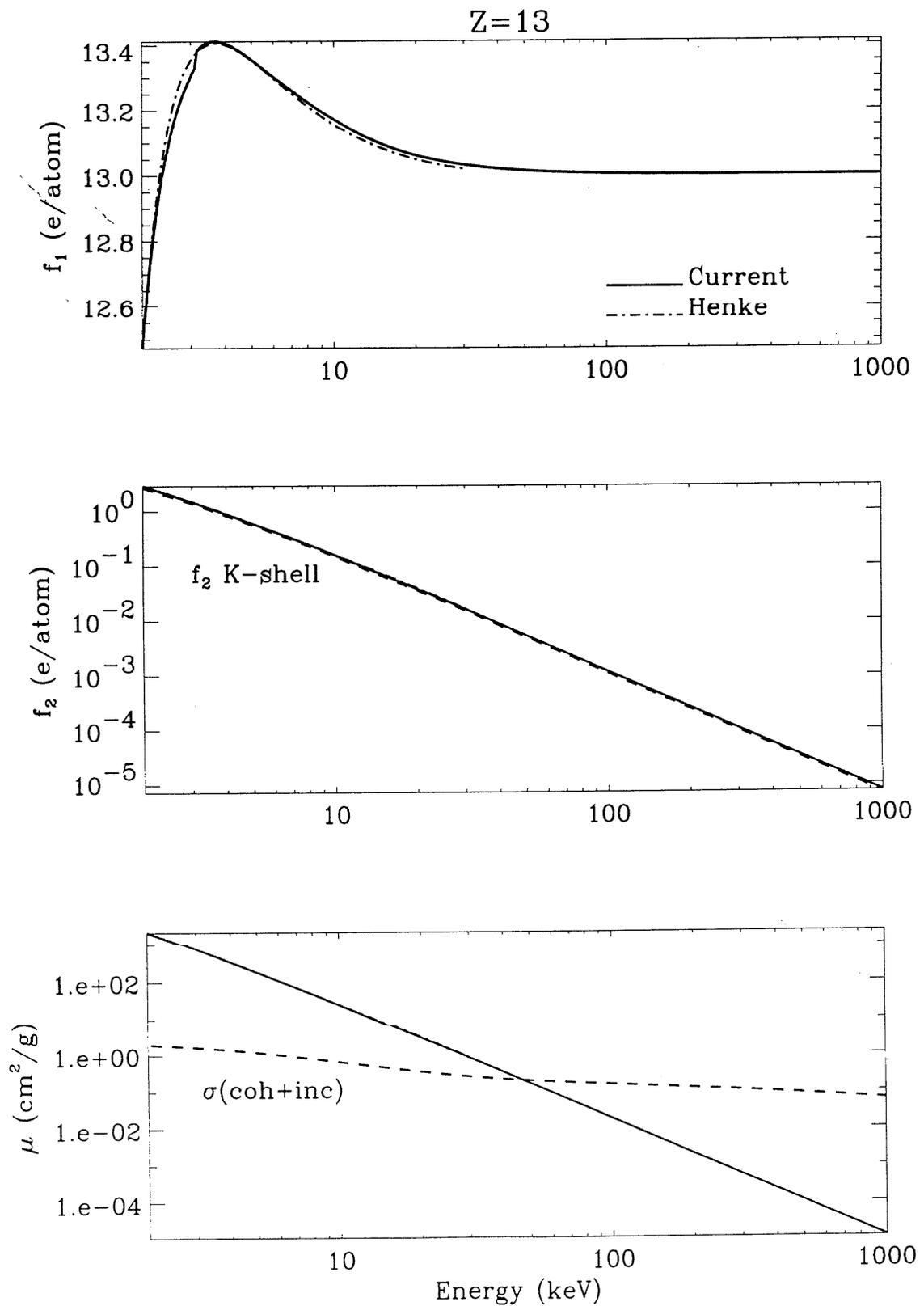
E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
1.349368E-01	6.04241E+00	9.3134E+00	1.0764E+05	3.2234E-01	0.000E+00	9.188E+00
1.442475E-01	7.06078E+00	9.0606E+00	9.7963E+04	3.6238E-01	0.000E+00	8.595E+00
1.542005E-01	7.95326E+00	8.7125E+00	8.8119E+04	4.0572E-01	0.000E+00	8.040E+00
1.648404E-01	8.72829E+00	8.2962E+00	7.8493E+04	4.5237E-01	0.000E+00	7.521E+00
1.762144E-01	9.39304E+00	7.8365E+00	6.9358E+04	5.0235E-01	0.000E+00	7.036E+00
1.883732E-01	9.95657E+00	7.3536E+00	6.0883E+04	5.5561E-01	0.000E+00	6.582E+00
2.013709E-01	1.04290E+01	6.8631E+00	5.3154E+04	6.1206E-01	0.000E+00	6.157E+00
2.152655E-01	1.08209E+01	6.3766E+00	4.6198E+04	6.7158E-01	0.000E+00	5.760E+00
2.301188E-01	1.11424E+01	5.9026E+00	4.0004E+04	7.3400E-01	0.000E+00	5.388E+00
2.459970E-01	1.14037E+01	5.4470E+00	3.4534E+04	7.9910E-01	0.000E+00	5.040E+00
2.629708E-01	1.16133E+01	5.0136E+00	2.9734E+04	8.6664E-01	0.000E+00	4.715E+00
2.811158E-01	1.17794E+01	4.6044E+00	2.5545E+04	9.3629E-01	0.000E+00	4.410E+00
3.005128E-01	1.19090E+01	4.2203E+00	2.1903E+04	1.0077E+00	0.000E+00	4.126E+00
3.212482E-01	1.20075E+01	3.8603E+00	1.8741E+04	1.0805E+00	0.000E+00	3.859E+00
3.434143E-01	1.20791E+01	3.5244E+00	1.6006E+04	1.1543E+00	0.000E+00	3.610E+00
3.671099E-01	1.21278E+01	3.2123E+00	1.3647E+04	1.2286E+00	0.000E+00	3.377E+00
3.924405E-01	1.21573E+01	2.9236E+00	1.1619E+04	1.3029E+00	0.000E+00	3.159E+00
4.195189E-01	1.21706E+01	2.6572E+00	9.8783E+03	1.3768E+00	0.000E+00	2.955E+00
4.484657E-01	1.21704E+01	2.4121E+00	8.3884E+03	1.4496E+00	0.000E+00	2.765E+00
4.794098E-01	1.21590E+01	2.1872E+00	7.1152E+03	1.5209E+00	0.000E+00	2.586E+00
5.124891E-01	1.21381E+01	1.9809E+00	6.0282E+03	1.5901E+00	0.000E+00	2.419E+00
5.478508E-01	1.21089E+01	1.7921E+00	5.1016E+03	1.6567E+00	0.000E+00	2.263E+00
5.856525E-01	1.20725E+01	1.6196E+00	4.3131E+03	1.7202E+00	0.000E+00	2.117E+00
6.260625E-01	1.20297E+01	1.4625E+00	3.6434E+03	1.7801E+00	0.000E+00	1.980E+00
6.692609E-01	1.19809E+01	1.3197E+00	3.0753E+03	1.8359E+00	0.000E+00	1.853E+00
7.154399E-01	1.19265E+01	1.1901E+00	2.5943E+03	1.8872E+00	0.000E+00	1.733E+00
7.648052E-01	1.18662E+01	1.0727E+00	2.1875E+03	1.9336E+00	0.000E+00	1.621E+00
8.175768E-01	1.17996E+01	9.6659E-01	1.8439E+03	1.9747E+00	0.000E+00	1.516E+00
8.739896E-01	1.17255E+01	8.7081E-01	1.5539E+03	2.0102E+00	0.000E+00	1.419E+00
9.342948E-01	1.16420E+01	7.8450E-01	1.3095E+03	2.0399E+00	0.000E+00	1.327E+00
9.987612E-01	1.15461E+01	7.0682E-01	1.1037E+03	2.0635E+00	0.000E+00	1.241E+00
1.067676E+00	1.14444E+01	6.2898E-01	9.1878E+02	2.0810E+00	0.000E+00	1.161E+00
1.141345E+00	1.13023E+01	5.6009E-01	7.6533E+02	2.0923E+00	0.000E+00	1.086E+00
1.220098E+00	1.11171E+01	4.9919E-01	6.3809E+02	2.0973E+00	0.000E+00	1.016E+00
1.304285E+00	1.08582E+01	4.4531E-01	5.3248E+02	2.0960E+00	0.000E+00	9.506E-01
1.394281E+00	1.04460E+01	3.9707E-01	4.4415E+02	2.0887E+00	0.000E+00	8.892E-01
1.490486E+00	9.55217E+00	3.5292E-01	3.6928E+02	2.0754E+00	0.000E+00	8.318E-01
1.528408E+00	8.67724E+00	3.3771E-01	3.4460E+02	2.0689E+00	0.000E+00	8.112E-01
1.551802E+00	7.08006E+00	3.2887E-01	3.3052E+02	2.0646E+00	0.000E+00	7.990E-01
1.558040E+00	5.18127E+00	3.2657E-01	3.2690E+02	2.0634E+00	0.000E+00	7.958E-01
1.567398E+00	7.05820E+00	4.0561E+00	4.0359E+03	2.0616E+00	3.714E+03	7.910E-01
1.590792E+00	8.76616E+00	4.0340E+00	3.9549E+03	2.0569E+00	3.646E+03	7.794E-01
1.593329E+00	8.86568E+00	4.0316E+00	3.9463E+03	2.0564E+00	3.639E+03	7.781E-01
1.703269E+00	1.09116E+01	3.8047E+00	3.4838E+03	2.0318E+00	3.228E+03	7.279E-01
1.820795E+00	1.18026E+01	3.4335E+00	2.9410E+03	2.0020E+00	2.727E+03	6.809E-01
1.946430E+00	1.23246E+01	3.0522E+00	2.4456E+03	1.9673E+00	2.267E+03	6.370E-01
2.080733E+00	1.26397E+01	2.7132E+00	2.0336E+03	1.9282E+00	1.884E+03	5.959E-01
2.224304E+00	1.28559E+01	2.4305E+00	1.7041E+03	1.8849E+00	1.579E+03	5.574E-01
2.377781E+00	1.30119E+01	2.1807E+00	1.4303E+03	1.8378E+00	1.326E+03	5.214E-01
2.541848E+00	1.31269E+01	1.9587E+00	1.2018E+03	1.7875E+00	1.115E+03	4.878E-01
2.717235E+00	1.32127E+01	1.7592E+00	1.0097E+03	1.7343E+00	9.378E+02	4.563E-01
2.904724E+00	1.32769E+01	1.5787E+00	8.4765E+02	1.6787E+00	7.878E+02	4.268E-01
3.105150E+00	1.33285E+01	1.4117E+00	7.0906E+02	1.6212E+00	6.596E+02	3.993E-01
3.319406E+00	1.34011E+01	1.2507E+00	5.8762E+02	1.5620E+00	5.470E+02	3.735E-01
3.548445E+00	1.34116E+01	1.1075E+00	4.8676E+02	1.5018E+00	4.534E+02	3.494E-01
3.793288E+00	1.34114E+01	9.8077E-01	4.0324E+02	1.4408E+00	3.758E+02	3.269E-01
4.055024E+00	1.34039E+01	8.6856E-01	3.3405E+02	1.3795E+00	3.115E+02	3.058E-01
4.334821E+00	1.33916E+01	7.6922E-01	2.7675E+02	1.3182E+00	2.582E+02	2.860E-01
4.633924E+00	1.33759E+01	6.8127E-01	2.2929E+02	1.2572E+00	2.140E+02	2.676E-01
4.953664E+00	1.33581E+01	6.0341E-01	1.8998E+02	1.1969E+00	1.774E+02	2.503E-01
5.295467E+00	1.33392E+01	5.3446E-01	1.5741E+02	1.1376E+00	1.470E+02	2.341E-01
5.660855E+00	1.33198E+01	4.7341E-01	1.3043E+02	1.0796E+00	1.218E+02	2.190E-01
6.051453E+00	1.33004E+01	4.1935E-01	1.0808E+02	1.0229E+00	1.010E+02	2.049E-01
6.469004E+00	1.32816E+01	3.7148E-01	8.9558E+01	9.6791E-01	8.370E+01	1.917E-01
6.915365E+00	1.32637E+01	3.2822E-01	7.4022E+01	9.1472E-01	6.919E+01	1.793E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
7.392525E+00	1.32456E+01	2.8857E-01	6.0881E+01	8.6348E-01	5.688E+01	1.677E-01
7.902609E+00	1.32277E+01	2.5373E-01	5.0073E+01	8.1431E-01	4.677E+01	1.569E-01
8.447890E+00	1.32105E+01	2.2309E-01	4.1186E+01	7.6728E-01	3.845E+01	1.468E-01
9.030794E+00	1.31945E+01	1.9580E-01	3.3814E+01	7.2247E-01	3.156E+01	1.373E-01
9.653919E+00	1.31795E+01	1.7070E-01	2.7577E+01	6.7991E-01	2.574E+01	1.284E-01
1.032004E+01	1.31646E+01	1.4882E-01	2.2491E+01	6.3961E-01	2.099E+01	1.201E-01
1.103212E+01	1.31503E+01	1.2975E-01	1.8343E+01	6.0158E-01	1.712E+01	1.124E-01
1.179334E+01	1.31369E+01	1.1313E-01	1.4961E+01	5.6579E-01	1.397E+01	1.051E-01
1.260708E+01	1.31243E+01	9.8639E-02	1.2202E+01	5.3222E-01	1.139E+01	9.834E-02
1.347697E+01	1.31128E+01	8.6005E-02	9.9528E+00	5.0080E-01	9.290E+00	9.200E-02
1.440688E+01	1.31021E+01	7.4990E-02	8.1180E+00	4.7149E-01	7.577E+00	8.606E-02
1.540095E+01	1.30923E+01	6.5387E-02	6.6216E+00	4.4420E-01	6.180E+00	8.050E-02
1.646362E+01	1.30833E+01	5.7015E-02	5.4010E+00	4.1887E-01	5.041E+00	7.531E-02
1.759961E+01	1.30752E+01	4.9716E-02	4.4056E+00	3.9539E-01	4.111E+00	7.045E-02
1.881398E+01	1.30677E+01	4.3351E-02	3.5936E+00	3.7369E-01	3.353E+00	6.590E-02
2.011215E+01	1.30610E+01	3.7802E-02	2.9314E+00	3.5368E-01	2.735E+00	6.165E-02
2.149988E+01	1.30548E+01	3.2964E-02	2.3912E+00	3.3524E-01	2.231E+00	5.767E-02
2.298338E+01	1.30493E+01	2.8745E-02	1.9506E+00	3.1829E-01	1.819E+00	5.395E-02
2.456923E+01	1.30443E+01	2.5066E-02	1.5912E+00	3.0273E-01	1.484E+00	5.046E-02
2.626450E+01	1.30397E+01	2.1859E-02	1.2980E+00	2.8846E-01	1.210E+00	4.721E-02
2.807676E+01	1.30358E+01	1.8978E-02	1.0542E+00	2.7539E-01	9.830E-01	4.416E-02
3.001405E+01	1.30321E+01	1.6453E-02	8.5493E-01	2.6343E-01	7.973E-01	4.131E-02
3.208502E+01	1.30288E+01	1.4264E-02	6.9335E-01	2.5248E-01	6.466E-01	3.864E-02
3.429889E+01	1.30258E+01	1.2344E-02	5.6128E-01	2.4246E-01	5.234E-01	3.615E-02
3.666551E+01	1.30231E+01	1.0660E-02	4.5343E-01	2.3329E-01	4.227E-01	3.381E-02
3.919543E+01	1.30206E+01	9.2057E-03	3.6630E-01	2.2489E-01	3.414E-01	3.163E-02
4.189992E+01	1.30184E+01	7.9499E-03	2.9591E-01	2.1718E-01	2.757E-01	2.959E-02
4.479101E+01	1.30164E+01	6.8656E-03	2.3905E-01	2.1010E-01	2.227E-01	2.768E-02
4.788159E+01	1.30146E+01	5.9291E-03	1.9312E-01	2.0359E-01	1.798E-01	2.589E-02
5.118542E+01	1.30130E+01	5.1204E-03	1.5602E-01	1.9757E-01	1.452E-01	2.422E-02
5.471721E+01	1.30116E+01	4.4218E-03	1.2603E-01	1.9200E-01	1.173E-01	2.266E-02
5.849270E+01	1.30103E+01	3.8180E-03	1.0180E-01	1.8683E-01	9.474E-02	2.120E-02
6.252870E+01	1.30091E+01	3.2967E-03	8.2227E-02	1.8200E-01	7.652E-02	1.983E-02
6.684318E+01	1.30081E+01	2.8466E-03	6.6417E-02	1.7747E-01	6.180E-02	1.855E-02
7.145536E+01	1.30072E+01	2.4579E-03	5.3647E-02	1.7321E-01	4.991E-02	1.735E-02
7.638578E+01	1.30064E+01	2.1224E-03	4.3333E-02	1.6918E-01	4.031E-02	1.623E-02
8.165640E+01	1.30057E+01	1.8326E-03	3.5002E-02	1.6534E-01	3.256E-02	1.518E-02
8.729069E+01	1.30050E+01	1.5824E-03	2.8272E-02	1.6168E-01	2.629E-02	1.420E-02
9.331374E+01	1.30045E+01	1.3664E-03	2.2837E-02	1.5816E-01	2.124E-02	1.329E-02
9.975239E+01	1.30040E+01	1.1798E-03	1.8447E-02	1.5476E-01	1.715E-02	1.243E-02
1.066353E+02	1.30035E+01	1.0188E-03	1.4900E-02	1.5146E-01	1.385E-02	1.163E-02
1.139931E+02	1.30031E+01	8.7971E-04	1.2036E-02	1.4824E-01	1.119E-02	1.088E-02
1.218587E+02	1.30027E+01	7.5962E-04	9.7220E-03	1.4510E-01	9.035E-03	1.017E-02
1.302669E+02	1.30024E+01	6.5593E-04	7.8530E-03	1.4202E-01	7.297E-03	9.518E-03
1.392553E+02	1.30022E+01	5.6639E-04	6.3434E-03	1.3898E-01	5.893E-03	8.903E-03
1.488640E+02	1.30019E+01	4.8908E-04	5.1239E-03	1.3598E-01	4.759E-03	8.329E-03
1.591356E+02	1.30017E+01	4.2232E-04	4.1389E-03	1.3302E-01	3.844E-03	7.791E-03
1.701159E+02	1.30015E+01	3.6468E-04	3.3433E-03	1.3008E-01	3.104E-03	7.288E-03
1.818539E+02	1.30013E+01	3.1490E-04	2.7006E-03	1.2716E-01	2.507E-03	6.818E-03
1.944018E+02	1.30012E+01	2.7192E-04	2.1815E-03	1.2426E-01	2.025E-03	6.378E-03
2.078156E+02	1.30010E+01	2.3481E-04	1.7622E-03	1.2138E-01	1.635E-03	5.966E-03
2.221548E+02	1.30009E+01	2.0276E-04	1.4234E-03	1.1851E-01	1.321E-03	5.581E-03
2.374835E+02	1.30008E+01	1.7508E-04	1.1498E-03	1.1565E-01	1.067E-03	5.221E-03
2.538699E+02	1.30007E+01	1.5119E-04	9.2880E-04	1.1281E-01	8.616E-04	4.884E-03
2.713869E+02	1.30006E+01	1.3055E-04	7.5026E-04	1.0998E-01	6.958E-04	4.569E-03
2.901126E+02	1.30005E+01	1.1274E-04	6.0605E-04	1.0717E-01	5.620E-04	4.274E-03
3.101304E+02	1.30005E+01	9.7350E-05	4.8956E-04	1.0437E-01	4.539E-04	3.998E-03
3.315294E+02	1.30004E+01	8.4064E-05	3.9546E-04	1.0159E-01	3.666E-04	3.740E-03
3.544049E+02	1.30004E+01	7.2591E-05	3.1945E-04	9.8834E-02	2.960E-04	3.498E-03
3.788588E+02	1.30003E+01	6.2685E-05	2.5805E-04	9.6097E-02	2.391E-04	3.273E-03
4.050001E+02	1.30003E+01	5.4130E-05	2.0845E-04	9.3384E-02	1.931E-04	3.061E-03
4.329451E+02	1.30003E+01	4.6743E-05	1.6838E-04	9.0698E-02	1.560E-04	2.864E-03

Z=13





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 149

SI Z = 14

Atomic weight = 2.808550E+01 g/mol, nominal density ρ (g/cm³) = 2.3200E+00

μ_{rel} (barns/atom) = μ (cm²/g) \times 4.66371E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.49829E+06

6 edges. Edge energies (keV):

K 1.83890E+00 L I 1.48700E-00 L II 9.92000E-02 L III 9.92000E-02
M I 1.13572E-02 M II 5.08305E-03
Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.6197E-02, -1.5600E-02 e/atom
Nuclear Thomson correction f_{NT} = -3.8284E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{K} cm ² /g	λ nm
4.981393E-03	5.50431E-01	0.0000E+00	0.0000E+00	2.1060E-06	0.000E+00	2.489E+02
5.057639E-03	-3.20849E-01	0.0000E+00	0.0000E+00	2.2934E-06	0.000E+00	2.451E+02
5.077971E-03	-1.28029E+00	0.0000E+00	0.0000E+00	2.3455E-06	0.000E+00	2.442E+02
5.108469E-03	-4.07656E-01	1.8433E+00	5.4064E+05	2.4254E-06	0.000E+00	2.427E+02
5.184715E-03	3.19503E-01	1.9476E+00	5.6283E+05	2.6344E-06	0.000E+00	2.391E+02
1.069000E-02	4.49043E+00	4.9472E-01	6.9340E+04	1.0523E-04	0.000E+00	1.160E+02
1.113003E-02	4.41607E+00	4.0981E-01	5.5167E+04	1.2673E-04	0.000E+00	1.114E+02
1.130038E-02	4.38482E+00	3.8216E-01	5.0670E+04	1.3585E-04	0.000E+00	1.097E+02
1.134581E-02	4.37198E+00	3.7522E-01	4.9550E+04	1.3836E-04	0.000E+00	1.093E+02
1.141396E-02	4.36769E+00	3.7687E-01	4.9471E+04	1.4218E-04	0.000E+00	1.086E+02
1.142761E-02	4.36646E+00	3.7492E-01	4.9156E+04	1.4296E-04	0.000E+00	1.085E+02
1.158431E-02	4.34801E+00	3.5360E-01	4.5733E+04	1.5208E-04	0.000E+00	1.070E+02
1.221612E-02	4.26861E+00	2.8398E-01	3.4829E+04	1.9313E-04	0.000E+00	1.015E+02
1.305903E-02	4.17557E+00	2.2096E-01	2.5351E+04	2.5948E-04	0.000E+00	9.494E+01
1.396010E-02	4.09293E+00	1.7788E-01	1.9091E+04	3.4673E-04	0.000E+00	8.881E+01
1.492335E-02	4.02013E+00	1.4900E-01	1.4960E+04	4.6080E-04	0.000E+00	8.308E+01
1.595306E-02	3.95663E+00	1.3038E-01	1.2246E+04	6.0910E-04	0.000E+00	7.772E+01
1.705382E-02	3.89925E+00	1.1936E-01	1.0487E+04	8.0082E-04	0.000E+00	7.270E+01
1.823053E-02	3.84744E+00	1.1415E-01	9.3811E+03	1.0473E-03	0.000E+00	6.801E+01
1.948844E-02	3.79998E+00	1.1354E-01	8.7290E+03	1.3624E-03	0.000E+00	6.362E+01
2.083314E-02	3.75582E+00	1.1673E-01	8.3951E+03	1.7630E-03	0.000E+00	5.951E+01
2.227063E-02	3.71414E+00	1.2324E-01	8.2913E+03	2.2694E-03	0.000E+00	5.567E+01
2.380730E-02	3.67429E+00	1.3259E-01	8.3445E+03	2.9063E-03	0.000E+00	5.208E+01
2.545001E-02	3.63561E+00	1.4434E-01	8.4979E+03	3.7027E-03	0.000E+00	4.872E+01
2.720606E-02	3.59745E+00	1.5811E-01	8.7075E+03	4.6933E-03	0.000E+00	4.557E+01
2.908327E-02	3.55913E+00	1.7351E-01	8.9389E+03	5.9187E-03	0.000E+00	4.263E+01
3.109002E-02	3.51987E+00	1.9016E-01	9.1644E+03	7.4265E-03	0.000E+00	3.988E+01
3.323523E-02	3.47876E+00	2.0768E-01	9.3624E+03	9.2717E-03	0.000E+00	3.731E+01
3.552846E-02	3.43487E+00	2.2566E-01	9.5165E+03	1.1518E-02	0.000E+00	3.490E+01
3.797993E-02	3.38651E+00	2.4374E-01	9.6153E+03	1.4238E-02	0.000E+00	3.264E+01
4.060054E-02	3.33221E+00	2.6154E-01	9.6518E+03	1.7513E-02	0.000E+00	3.054E+01
4.340198E-02	3.26991E+00	2.7876E-01	9.6232E+03	2.1438E-02	0.000E+00	2.857E+01
4.639671E-02	3.19712E+00	2.9508E-01	9.5291E+03	2.6115E-02	0.000E+00	2.672E+01
4.959809E-02	3.11054E+00	3.1003E-01	9.3656E+03	3.1661E-02	0.000E+00	2.500E+01
5.302035E-02	3.00579E+00	3.2339E-01	9.1385E+03	3.8201E-02	0.000E+00	2.338E+01
5.667876E-02	2.87721E+00	3.3506E-01	8.8572E+03	4.5874E-02	0.000E+00	2.187E+01
6.058959E-02	2.71713E+00	3.4502E-01	8.5317E+03	5.4830E-02	0.000E+00	2.046E+01
6.477028E-02	2.51474E+00	3.5326E-01	8.1717E+03	6.5230E-02	0.000E+00	1.914E+01
6.923942E-02	2.25390E+00	3.5981E-01	7.7860E+03	7.7244E-02	0.000E+00	1.791E+01
7.401695E-02	1.90880E+00	3.6472E-01	7.3829E+03	9.1051E-02	0.000E+00	1.675E+01
7.912411E-02	1.43406E+00	3.6805E-01	6.9694E+03	1.0684E-01	0.000E+00	1.567E+01
8.458368E-02	7.37405E-01	3.6987E-01	6.5518E+03	1.2480E-01	0.000E+00	1.466E+01
9.041995E-02	-4.23197E-01	3.7026E-01	6.1353E+03	1.4512E-01	0.000E+00	1.371E+01
9.665893E-02	-3.28171E+00	3.6804E-01	5.7049E+03	1.6800E-01	0.000E+00	1.283E+01
9.721600E-02	-3.84572E+00	3.6732E-01	5.6611E+03	1.7010E-01	0.000E+00	1.275E+01
9.870400E-02	-6.95115E+00	3.6535E-01	5.5458E+03	1.7574E-01	0.000E+00	1.256E+01
9.910080E-02	-1.04791E+01	3.6481E-01	5.5155E+03	1.7726E-01	0.000E+00	1.251E+01
9.969600E-02	-7.07666E+00	7.2061E+00	1.0830E+05	1.7954E-01	0.000E+00	1.244E+01
1.011840E-01	-4.18129E+00	7.3507E+00	1.0885E+05	1.8527E-01	0.000E+00	1.225E+01
1.033284E-01	-2.67470E+00	7.5606E+00	1.0963E+05	1.9364E-01	0.000E+00	1.200E+01
1.104581E-01	-4.73104E-01	8.2681E+00	1.1215E+05	2.2221E-01	0.000E+00	1.122E+01
1.180797E-01	1.02847E+00	8.8713E+00	1.1237E+05	2.3389E-01	0.000E+00	1.050E+01
1.262272E-01	2.34527E+00	9.2705E+00	1.1004E+05	2.8883E-01	0.000E+00	9.822E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.349368E-01	3.51620E+00	9.4680E+00	1.0513E+05	3.2718E-01	0.000E+00	9.188E+00
1.442475E-01	4.39577E+00	9.4800E+00	9.8468E+04	3.6906E-01	0.000E+00	8.595E+00
1.457260E-01	4.44809E+00	9.4670E+00	9.7336E+04	3.7577E-01	0.000E+00	8.508E+00
1.479565E-01	4.27331E+00	9.4409E+00	9.5604E+04	3.8594E-01	0.000E+00	8.380E+00
1.485513E-01	3.83506E+00	9.4327E+00	9.5138E+04	3.8865E-01	0.000E+00	8.346E+00
1.494435E-01	4.43854E+00	1.0408E+01	1.0435E+05	3.9273E-01	0.000E+00	8.296E+00
1.516740E-01	5.11882E+00	1.0379E+01	1.0252E+05	4.0294E-01	0.000E+00	8.174E+00
1.542005E-01	5.58201E+00	1.0338E+01	1.0045E+05	4.1455E-01	0.000E+00	8.040E+00
1.648404E-01	6.95675E+00	1.0098E+01	9.1788E+04	4.6370E-01	0.000E+00	7.521E+00
1.762144E-01	8.06341E+00	9.7527E+00	8.2924E+04	5.1654E-01	0.000E+00	7.036E+00
1.883732E-01	9.00930E+00	9.3252E+00	7.4171E+04	5.7305E-01	0.000E+00	6.582E+00
2.013709E-01	9.82004E+00	8.8416E+00	6.5785E+04	6.3316E-01	0.000E+00	6.157E+00
2.152655E-01	1.05105E+01	8.3235E+00	5.7933E+04	6.9677E-01	0.000E+00	5.760E+00
2.301188E-01	1.10929E+01	7.7878E+00	5.0706E+04	7.6370E-01	0.000E+00	5.388E+00
2.459970E-01	1.15791E+01	7.2498E+00	4.4156E+04	8.3376E-01	0.000E+00	5.040E+00
2.629708E-01	1.19807E+01	6.7202E+00	3.8289E+04	9.0668E-01	0.000E+00	4.715E+00
2.811158E-01	1.23087E+01	6.2068E+00	3.3081E+04	9.8215E-01	0.000E+00	4.410E+00
3.005128E-01	1.25735E+01	5.7150E+00	2.8494E+04	1.0598E+00	0.000E+00	4.126E+00
3.212482E-01	1.27839E+01	5.2483E+00	2.4478E+04	1.1393E+00	0.000E+00	3.859E+00
3.434143E-01	1.29483E+01	4.8086E+00	2.0980E+04	1.2200E+00	0.000E+00	3.610E+00
3.671099E-01	1.30739E+01	4.3969E+00	1.7945E+04	1.3017E+00	0.000E+00	3.377E+00
3.924405E-01	1.31670E+01	4.0133E+00	1.5322E+04	1.3836E+00	0.000E+00	3.159E+00
4.195189E-01	1.32331E+01	3.6568E+00	1.3060E+04	1.4653E+00	0.000E+00	2.955E+00
4.484657E-01	1.32758E+01	3.3258E+00	1.1111E+04	1.5462E+00	0.000E+00	2.765E+00
4.794098E-01	1.32987E+01	3.0200E+00	9.4385E+03	1.6257E+00	0.000E+00	2.586E+00
5.124891E-01	1.33048E+01	2.7385E+00	8.0063E+03	1.7032E+00	0.000E+00	2.419E+00
5.478508E-01	1.32972E+01	2.4802E+00	6.7830E+03	1.7782E+00	0.000E+00	2.263E+00
5.856525E-01	1.32781E+01	2.2438E+00	5.7405E+03	1.8499E+00	0.000E+00	2.117E+00
6.260625E-01	1.32495E+01	2.0280E+00	4.8533E+03	1.9180E+00	0.000E+00	1.980E+00
6.692609E-01	1.32130E+01	1.8311E+00	4.0993E+03	1.9817E+00	0.000E+00	1.853E+00
7.154399E-01	1.31695E+01	1.6519E+00	3.4595E+03	2.0406E+00	0.000E+00	1.733E+00
7.648052E-01	1.31201E+01	1.4894E+00	2.9178E+03	2.0943E+00	0.000E+00	1.621E+00
8.175768E-01	1.30654E+01	1.3422E+00	2.4597E+03	2.1424E+00	0.000E+00	1.516E+00
8.739896E-01	1.30058E+01	1.2092E+00	2.0730E+03	2.1844E+00	0.000E+00	1.419E+00
9.342948E-01	1.29418E+01	1.0893E+00	1.7469E+03	2.2200E+00	0.000E+00	1.327E+00
9.987612E-01	1.28743E+01	9.8137E-01	1.4722E+03	2.2490E+00	0.000E+00	1.241E+00
1.067676E+00	1.27932E+01	8.7137E-01	1.2228E+03	2.2713E+00	0.000E+00	1.161E+00
1.141345E+00	1.26978E+01	7.7420E-01	1.0163E+03	2.2867E+00	0.000E+00	1.086E+00
1.220098E+00	1.25861E+01	6.8851E-01	8.4549E+02	2.2951E+00	0.000E+00	1.016E+00
1.304285E+00	1.24527E+01	6.1287E-01	7.0403E+02	2.2966E+00	0.000E+00	9.506E-01
1.394281E+00	1.22868E+01	5.4605E-01	5.8678E+02	2.2913E+00	0.000E+00	8.892E-01
1.490486E+00	1.20669E+01	4.8696E-01	4.8951E+02	2.2792E+00	0.000E+00	8.318E-01
1.593329E+00	1.17442E+01	4.3467E-01	4.0874E+02	2.2607E+00	0.000E+00	7.781E-01
1.703269E+00	1.11665E+01	3.8835E-01	3.4161E+02	2.2359E+00	0.000E+00	7.279E-01
1.802122E+00	9.77316E+00	3.5330E-01	2.9374E+02	2.2104E+00	0.000E+00	6.880E-01
1.820795E+00	8.96867E+00	3.4728E-01	2.8577E+02	2.2052E+00	0.000E+00	6.809E-01
1.829705E+00	8.18207E+00	3.4446E-01	2.8207E+02	2.2028E+00	0.000E+00	6.776E-01
1.837061E+00	6.28036E+00	3.4216E-01	2.7907E+02	2.2007E+00	0.000E+00	6.749E-01
1.848094E+00	8.18045E+00	4.0819E+00	3.3093E+03	2.1976E+00	3.035E+03	6.709E-01
1.875678E+00	9.90765E+00	4.0304E+00	3.2195E+03	2.1898E+00	2.956E+03	6.610E-01
1.946430E+00	1.15530E+01	3.8896E+00	2.9941E+03	2.1690E+00	2.756E+03	6.370E-01
2.080733E+00	1.25086E+01	3.5283E+00	2.5407E+03	2.1275E+00	2.342E+03	5.959E-01
2.224304E+00	1.31320E+01	3.1614E+00	2.1295E+03	2.0813E+00	1.964E+03	5.574E-01
2.377781E+00	1.35165E+01	2.8224E+00	1.7785E+03	2.0309E+00	1.640E+03	5.214E-01
2.541848E+00	1.37720E+01	2.5325E+00	1.4928E+03	1.9765E+00	1.377E+03	4.878E-01
2.717235E+00	1.39567E+01	2.2762E+00	1.2551E+03	1.9188E+00	1.158E+03	4.563E-01
2.904724E+00	1.40941E+01	2.0459E+00	1.0553E+03	1.8583E+00	9.741E+02	4.268E-01
3.105150E+00	1.41991E+01	1.8323E+00	8.8413E+02	1.7954E+00	8.170E+02	3.993E-01
3.319406E+00	1.42699E+01	1.6363E+00	7.3859E+02	1.7306E+00	6.835E+02	3.735E-01
3.548445E+00	1.43185E+01	1.4614E+00	6.1706E+02	1.6643E+00	5.717E+02	3.494E-01
3.793288E+00	1.43972E+01	1.2999E+00	5.1345E+02	1.5972E+00	4.762E+02	3.269E-01
4.055024E+00	1.44122E+01	1.1509E+00	4.2524E+02	1.5295E+00	3.945E+02	3.058E-01
4.334821E+00	1.44148E+01	1.0190E+00	3.5220E+02	1.4617E+00	3.269E+02	2.860E-01
4.633924E+00	1.44092E+01	9.0223E-01	2.9172E+02	1.3941E+00	2.708E+02	2.676E-01
4.953664E+00	1.43980E+01	7.9890E-01	2.4164E+02	1.3272E+00	2.244E+02	2.503E-01

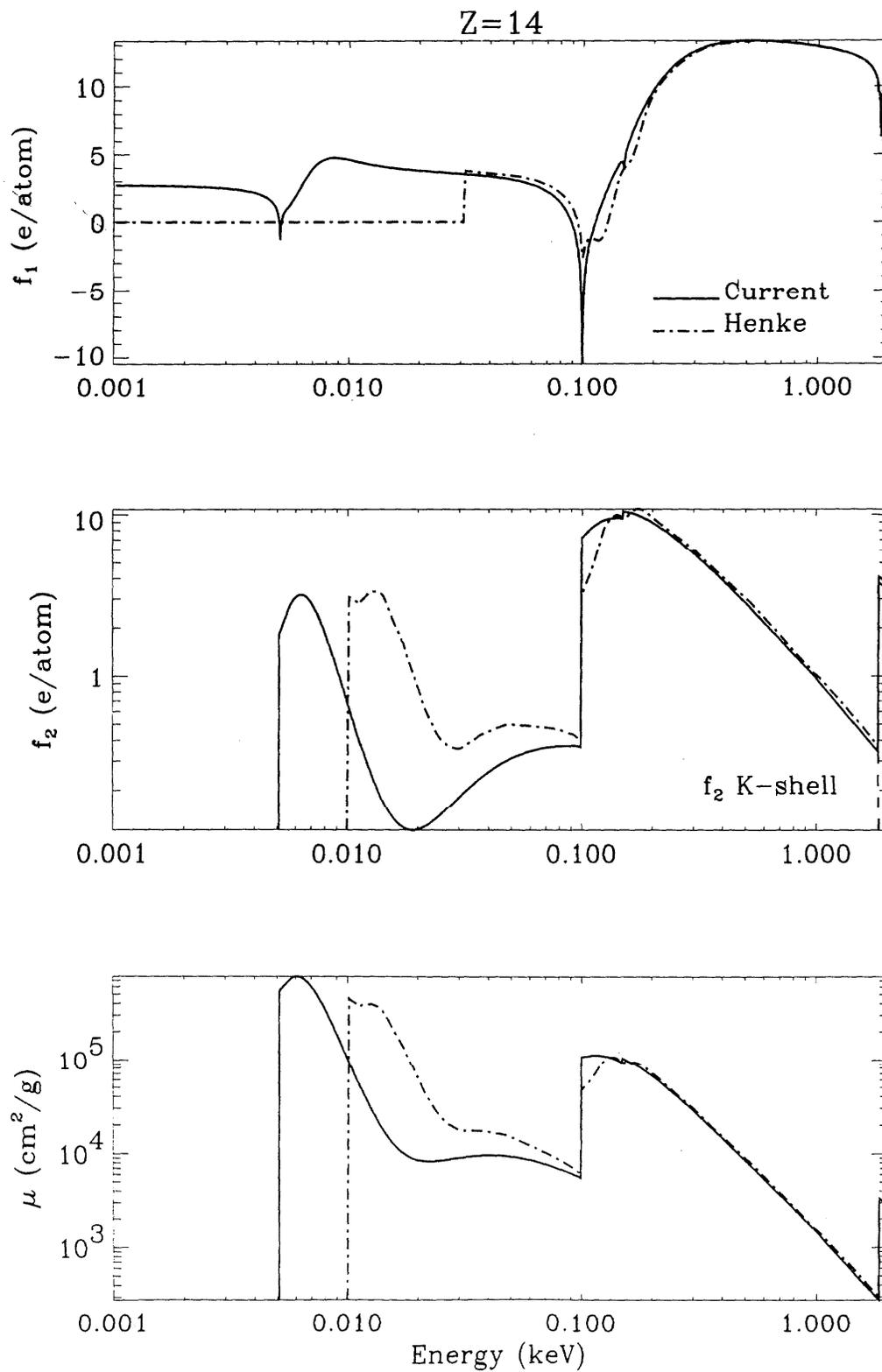
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 151

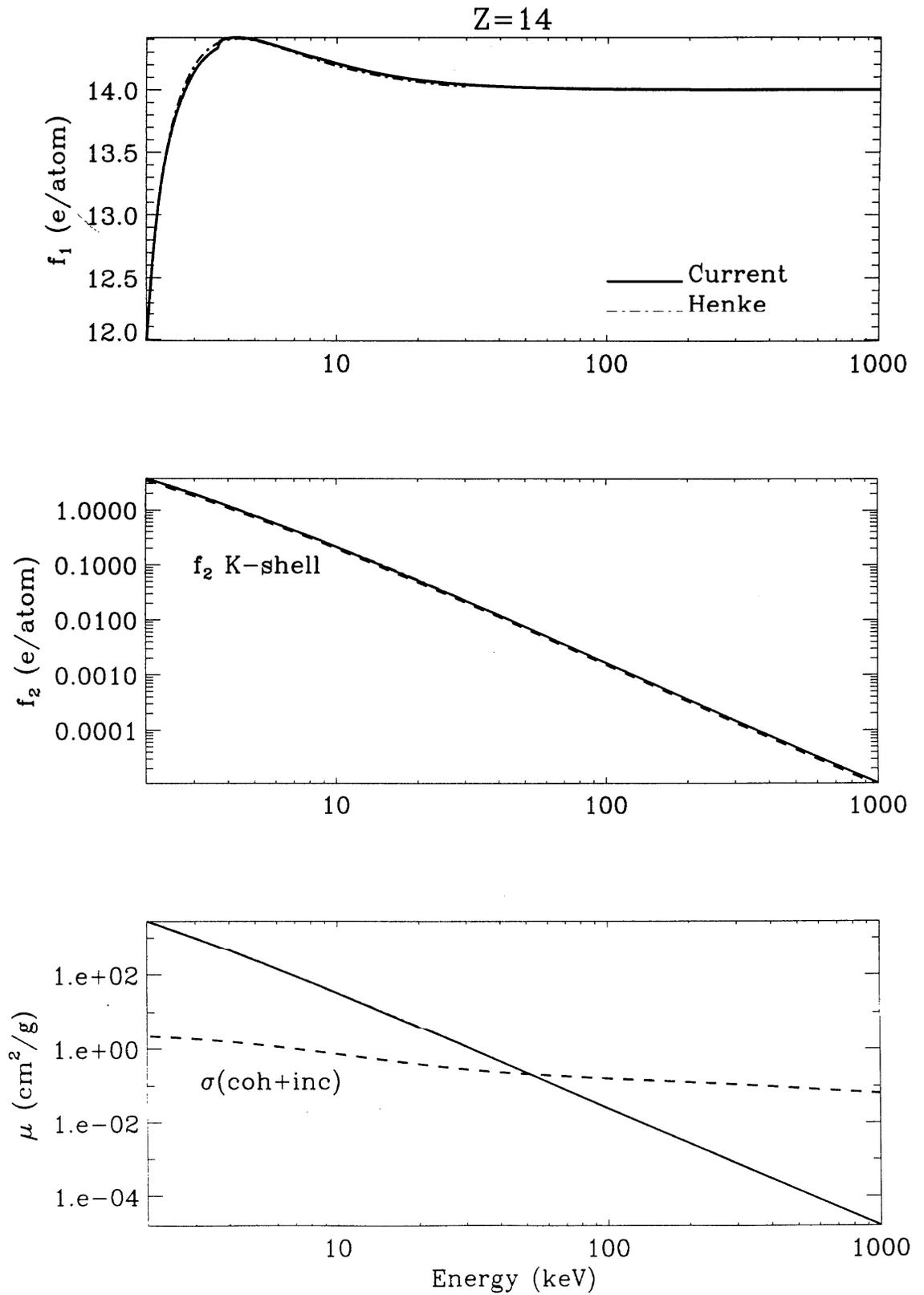
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
5.295467E+00	1.43830E+01	7.0743E-01	2.0016E+02	1.2613E+00	1.859E+02	2.341E-01
5.660855E+00	1.43657E+01	6.2644E-01	1.6580E+02	1.1967E+00	1.541E+02	2.190E-01
6.051453E+00	1.43470E+01	5.5475E-01	1.3735E+02	1.1336E+00	1.276E+02	2.049E-01
6.469004E+00	1.43275E+01	4.9128E-01	1.1379E+02	1.0722E+00	1.058E+02	1.917E-01
6.915365E+00	1.43080E+01	4.3509E-01	9.4267E+01	1.0128E+00	8.763E+01	1.793E-01
7.392525E+00	1.42890E+01	3.8534E-01	7.8099E+01	9.5551E-01	7.261E+01	1.677E-01
7.902609E+00	1.42709E+01	3.4129E-01	6.4707E+01	9.0049E-01	6.016E+01	1.569E-01
8.447890E+00	1.42537E+01	3.0059E-01	5.3312E+01	8.4782E-01	4.955E+01	1.468E-01
9.030794E+00	1.42373E+01	2.6409E-01	4.3815E+01	7.9760E-01	4.070E+01	1.373E-01
9.653919E+00	1.42193E+01	2.3060E-01	3.5789E+01	7.4986E-01	3.325E+01	1.284E-01
1.032004E+01	1.42018E+01	2.0136E-01	2.9233E+01	7.0464E-01	2.716E+01	1.201E-01
1.103212E+01	1.41850E+01	1.7583E-01	2.3879E+01	6.6193E-01	2.219E+01	1.124E-01
1.179334E+01	1.41691E+01	1.5354E-01	1.9507E+01	6.2172E-01	1.813E+01	1.051E-01
1.260708E+01	1.41542E+01	1.3408E-01	1.5935E+01	5.8398E-01	1.481E+01	9.834E-02
1.347697E+01	1.41404E+01	1.1709E-01	1.3017E+01	5.4864E-01	1.210E+01	9.200E-02
1.440688E+01	1.41275E+01	1.0225E-01	1.0634E+01	5.1565E-01	9.884E+00	8.606E-02
1.540095E+01	1.41156E+01	8.9301E-02	8.6877E+00	4.8493E-01	8.074E+00	8.050E-02
1.646362E+01	1.41047E+01	7.7990E-02	7.0976E+00	4.5640E-01	6.596E+00	7.531E-02
1.759961E+01	1.40947E+01	6.8113E-02	5.7986E+00	4.2996E-01	5.389E+00	7.045E-02
1.881398E+01	1.40856E+01	5.9487E-02	4.7374E+00	4.0551E-01	4.402E+00	6.590E-02
2.011215E+01	1.40772E+01	5.1955E-02	3.8705E+00	3.8295E-01	3.596E+00	6.165E-02
2.149988E+01	1.40696E+01	4.5377E-02	3.1623E+00	3.6217E-01	2.938E+00	5.767E-02
2.298338E+01	1.40628E+01	3.9633E-02	2.5837E+00	3.4306E-01	2.400E+00	5.395E-02
2.456923E+01	1.40566E+01	3.4616E-02	2.1110E+00	3.2552E-01	1.961E+00	5.046E-02
2.626450E+01	1.40511E+01	3.0235E-02	1.7248E+00	3.0943E-01	1.602E+00	4.721E-02
2.807676E+01	1.40462E+01	2.6276E-02	1.4022E+00	2.9470E-01	1.302E+00	4.416E-02
3.001405E+01	1.40415E+01	2.2797E-02	1.1380E+00	2.8122E-01	1.057E+00	4.131E-02
3.208502E+01	1.40372E+01	1.9779E-02	9.2365E-01	2.6889E-01	8.581E-01	3.864E-02
3.429889E+01	1.40333E+01	1.7161E-02	7.4966E-01	2.5761E-01	6.965E-01	3.615E-02
3.666551E+01	1.40298E+01	1.4890E-02	6.0846E-01	2.4729E-01	5.654E-01	3.381E-02
3.919543E+01	1.40267E+01	1.2919E-02	4.9385E-01	2.3785E-01	4.590E-01	3.163E-02
4.189992E+01	1.40239E+01	1.1160E-02	3.9906E-01	2.2920E-01	3.708E-01	2.959E-02
4.479101E+01	1.40213E+01	9.6400E-03	3.2246E-01	2.2126E-01	2.995E-01	2.768E-02
4.788159E+01	1.40191E+01	8.3272E-03	2.6057E-01	2.1397E-01	2.420E-01	2.589E-02
5.118542E+01	1.40170E+01	7.1932E-03	2.1056E-01	2.0725E-01	1.955E-01	2.422E-02
5.471721E+01	1.40151E+01	6.2137E-03	1.7015E-01	2.0104E-01	1.579E-01	2.266E-02
5.849270E+01	1.40135E+01	5.3676E-03	1.3749E-01	1.9529E-01	1.276E-01	2.120E-02
6.252870E+01	1.40120E+01	4.6367E-03	1.1110E-01	1.8993E-01	1.031E-01	1.983E-02
6.684318E+01	1.40107E+01	4.0054E-03	8.9782E-02	1.8493E-01	8.327E-02	1.855E-02
7.145536E+01	1.40095E+01	3.4605E-03	7.2561E-02	1.8024E-01	6.727E-02	1.735E-02
7.638578E+01	1.40084E+01	2.9899E-03	5.8646E-02	1.7582E-01	5.435E-02	1.623E-02
8.165640E+01	1.40075E+01	2.5832E-03	4.7399E-02	1.7163E-01	4.391E-02	1.518E-02
8.729069E+01	1.40066E+01	2.2319E-03	3.8309E-02	1.6764E-01	3.547E-02	1.420E-02
9.331374E+01	1.40059E+01	1.9284E-03	3.0963E-02	1.6382E-01	2.866E-02	1.329E-02
9.975239E+01	1.40052E+01	1.6662E-03	2.5026E-02	1.6015E-01	2.315E-02	1.243E-02
1.066353E+02	1.40046E+01	1.4396E-03	2.0227E-02	1.5661E-01	1.870E-02	1.163E-02
1.139931E+02	1.40041E+01	1.2438E-03	1.6349E-02	1.5317E-01	1.511E-02	1.088E-02
1.218587E+02	1.40036E+01	1.0747E-03	1.3214E-02	1.4983E-01	1.221E-02	1.017E-02
1.302669E+02	1.40032E+01	9.2859E-04	1.0680E-02	1.4655E-01	9.861E-03	9.518E-03
1.392553E+02	1.40029E+01	8.0234E-04	8.6327E-03	1.4335E-01	7.967E-03	8.903E-03
1.488640E+02	1.40025E+01	6.9326E-04	6.9776E-03	1.4019E-01	6.436E-03	8.329E-03
1.591356E+02	1.40022E+01	5.9902E-04	5.6398E-03	1.3708E-01	5.199E-03	7.791E-03
1.701159E+02	1.40020E+01	5.1758E-04	4.5586E-03	1.3400E-01	4.200E-03	7.288E-03
1.818539E+02	1.40017E+01	4.4723E-04	3.6847E-03	1.3096E-01	3.393E-03	6.818E-03
1.944018E+02	1.40015E+01	3.8643E-04	2.9783E-03	1.2795E-01	2.741E-03	6.378E-03
2.078156E+02	1.40014E+01	3.3391E-04	2.4074E-03	1.2496E-01	2.215E-03	5.966E-03
2.221548E+02	1.40012E+01	2.8852E-04	1.9459E-03	1.2199E-01	1.789E-03	5.581E-03
2.374835E+02	1.40011E+01	2.4931E-04	1.5729E-03	1.1905E-01	1.445E-03	5.221E-03
2.538699E+02	1.40009E+01	2.1542E-04	1.2714E-03	1.1612E-01	1.168E-03	4.884E-03
2.713869E+02	1.40008E+01	1.8614E-04	1.0277E-03	1.1322E-01	9.434E-04	4.569E-03
2.901266E+02	1.40007E+01	1.6085E-04	8.3070E-04	1.1034E-01	7.621E-04	4.274E-03
3.101304E+02	1.40006E+01	1.3899E-04	6.7147E-04	1.0747E-01	6.157E-04	3.998E-03
3.315294E+02	1.40006E+01	1.2010E-04	5.4277E-04	1.0464E-01	4.974E-04	3.740E-03
3.544049E+02	1.40005E+01	1.0378E-04	4.3874E-04	1.0182E-01	4.018E-04	3.498E-03
3.788588E+02	1.40004E+01	8.9678E-05	3.5465E-04	9.9033E-02	3.246E-04	3.273E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
4.050001E+02	1.40004E+01	7.7492E-05	2.8668E-04	9.6273E-02	2.623E-04	3.061E-03
4.329451E+02	1.40003E+01	6.6963E-05	2.3174E-04	9.3544E-02	2.119E-04	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 155

P Z = 15

μ_{atomic} weight = 3.097380E+01 g/mol, nominal density ρ (g/cm³) = 1.8200E+00

$\mu_{c,harns/atom}$ = μ (cm²/g) \times 5.14332E+01. F (eV) μ (cm²/g) - f_2 (e/atom) \times 1.35858E+06

edges. Edge energies (keV):

K 2.14550E+00 L I 1.89300E-00 L II 1.32200E-00 L III 1.32200E-01
 M 1.44615E-02 M II 6.38493E-03 M III 6.33669E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -3.0566E-02, -1.8000E-02 e/atom

Nuclear Thomson correction f_{NT} = -3.9850E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
6.209957E-03	-1.26929E+00	0.0000E+00	0.0000E+00	6.7573E-06	0.000E+00	1.997E+02
6.257232E-03	-1.66855E+00	0.0000E+00	0.0000E+00	7.0373E-06	0.000E+00	1.981E+02
6.305007E-03	-2.31139E+00	0.0000E+00	0.0000E+00	7.3292E-06	0.000E+00	1.966E+02
6.330354E-03	-3.07745E+00	0.0000E+00	0.0000E+00	7.4878E-06	0.000E+00	1.959E+02
6.353005E-03	-3.18301E+00	9.4416E-01	2.0191E+05	7.6317E-06	0.000E+00	1.952E+02
6.368374E-03	-3.42247E+00	9.5617E-01	2.0398E+05	7.7306E-06	0.000E+00	1.947E+02
6.378545E-03	-3.94072E+00	9.6419E-01	2.0536E+05	7.7965E-06	0.000E+00	1.944E+02
6.416855E-03	-2.90422E+00	2.9193E+00	6.1808E+05	8.0488E-06	0.000E+00	1.932E+02
6.463425E-03	-2.33032E+00	3.0314E+00	6.3719E+05	8.3639E-06	0.000E+00	1.918E+02
6.512629E-03	-2.02658E+00	3.1536E+00	6.5787E+05	8.7070E-06	0.000E+00	1.904E+02
1.069000E-02	6.73661E+00	3.0730E+00	3.9034E+05	1.0244E-04	0.000E+00	1.160E+02
1.142761E-02	6.70372E+00	2.2393E+00	2.6622E+05	1.3939E-04	0.000E+00	1.085E+02
1.221612E-02	6.52061E+00	1.6032E+00	1.7830E+05	1.8862E-04	0.000E+00	1.015E+02
1.305903E-02	6.27590E+00	1.1415E+00	1.1875E+05	2.5382E-04	0.000E+00	9.494E+01
1.396010E-02	6.02132E+00	8.1618E-01	7.9430E+04	3.3970E-04	0.000E+00	8.881E+01
1.417226E-02	5.96539E+00	7.5768E-01	7.2633E+04	3.6255E-04	0.000E+00	8.748E+01
1.438918E-02	5.91002E+00	7.0351E-01	6.6423E+04	3.8702E-04	0.000E+00	8.616E+01
1.444703E-02	5.89549E+00	6.8995E-01	6.4882E+04	3.9373E-04	0.000E+00	8.582E+01
1.453380E-02	5.87424E+00	6.7052E-01	6.2678E+04	4.0396E-04	0.000E+00	8.531E+01
1.475072E-02	5.82233E+00	6.2463E-01	5.7530E+04	4.3033E-04	0.000E+00	8.405E+01
1.492335E-02	5.78240E+00	5.9118E-01	5.3820E+04	4.5215E-04	0.000E+00	8.308E+01
1.595306E-02	5.56893E+00	4.3681E-01	3.7199E+04	5.9858E-04	0.000E+00	7.772E+01
1.705382E-02	5.38200E+00	3.3202E-01	2.6450E+04	7.8817E-04	0.000E+00	7.270E+01
1.823053E-02	5.21926E+00	2.6246E-01	1.9559E+04	1.0323E-03	0.000E+00	6.801E+01
1.948844E-02	5.07806E+00	2.1892E-01	1.5262E+04	1.3448E-03	0.000E+00	6.362E+01
2.083314E-02	4.95436E+00	1.9555E-01	1.2752E+04	1.7427E-03	0.000E+00	5.951E+01
2.227063E-02	4.84692E+00	1.8825E-01	1.1484E+04	2.2466E-03	0.000E+00	5.567E+01
2.380730E-02	4.75458E+00	1.9364E-01	1.1050E+04	2.8810E-03	0.000E+00	5.208E+01
2.545001E-02	4.67639E+00	2.0852E-01	1.1132E+04	3.6756E-03	0.000E+00	4.872E+01
2.720606E-02	4.61122E+00	2.2988E-01	1.1479E+04	4.6652E-03	0.000E+00	4.557E+01
2.908327E-02	4.55762E+00	2.5483E-01	1.1904E+04	5.8911E-03	0.000E+00	4.263E+01
3.109002E-02	4.51357E+00	2.8079E-01	1.2270E+04	7.4016E-03	0.000E+00	3.988E+01
3.323523E-02	4.47659E+00	3.0586E-01	1.2503E+04	9.2526E-03	0.000E+00	3.731E+01
3.552846E-02	4.44405E+00	3.2885E-01	1.2737E+04	1.1509E-02	0.000E+00	3.490E+01
3.797993E-02	4.41334E+00	3.4935E-01	1.2496E+04	1.4244E-02	0.000E+00	3.264E+01
4.060054E-02	4.38215E+00	3.6723E-01	1.2288E+04	1.7543E-02	0.000E+00	3.054E+01
4.340198E-02	4.34843E+00	3.8272E-01	1.1980E+04	2.1501E-02	0.000E+00	2.857E+01
4.639671E-02	4.30977E+00	3.9627E-01	1.1603E+04	2.6223E-02	0.000E+00	2.672E+01
4.959809E-02	4.26427E+00	4.0847E-01	1.1189E+04	3.1829E-02	0.000E+00	2.500E+01
5.302035E-02	4.20979E+00	4.2008E-01	1.0764E+04	3.8449E-02	0.000E+00	2.338E+01
5.667876E-02	4.14493E+00	4.3148E-01	1.0342E+04	4.6225E-02	0.000E+00	2.187E+01
6.058959E-02	4.06700E+00	4.4289E-01	9.9307E+03	5.5312E-02	0.000E+00	2.046E+01
6.477028E-02	3.97288E+00	4.5446E-01	9.5325E+03	6.5876E-02	0.000E+00	1.914E+01
6.923942E-02	3.85846E+00	4.6625E-01	9.1486E+03	7.8093E-02	0.000E+00	1.791E+01
7.401695E-02	3.71823E+00	4.7820E-01	8.7773E+03	9.2151E-02	0.000E+00	1.675E+01
7.912411E-02	3.54439E+00	4.9011E-01	8.4153E+03	1.0824E-01	0.000E+00	1.567E+01
8.458368E-02	3.32567E+00	5.0174E-01	8.0589E+03	1.2657E-01	0.000E+00	1.466E+01
9.041995E-02	3.04495E+00	5.1277E-01	7.7044E+03	1.4733E-01	0.000E+00	1.371E+01
9.665893E-02	2.67477E+00	5.2288E-01	7.3493E+03	1.7073E-01	0.000E+00	1.283E+01
1.033284E-01	2.16732E+00	5.3177E-01	6.9917E+03	1.9697E-01	0.000E+00	1.200E+01
1.104581E-01	1.42815E+00	5.3794E-01	6.6312E+03	2.2625E-01	0.000E+00	1.122E+01
1.180797E-01	2.26515E-01	5.4479E-01	6.2682E+03	2.5875E-01	0.000E+00	1.050E+01
1.262272E-01	-2.33819E+00	5.3712E-01	5.7810E+03	2.9463E-01	0.000E+00	9.822E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.295560E-01	-4.86950E+00	5.3236E-01	5.5825E+03	3.0958E-01	0.000E+00	9.570E+00
1.315390E-01	-9.24896E+00	5.2939E-01	5.4678E+03	3.1856E-01	0.000E+00	9.426E+00
1.320678E-01	-1.43590E+01	5.2859E-01	5.4376E+03	3.2096E-01	0.000E+00	9.388E+00
1.328610E-01	-9.24590E+00	1.0516E+01	1.0753E+05	3.2457E-01	0.000E+00	9.332E+00
1.349368E-01	-4.70611E+00	1.0551E+01	1.0623E+05	3.3406E-01	0.000E+00	9.188E+00
1.442475E-01	2.39838E-01	1.0704E+01	1.0082E+05	3.7715E-01	0.000E+00	8.595E+00
1.542005E-01	2.55586E+00	1.0790E+01	9.5065E+04	4.2400E-01	0.000E+00	8.040E+00
1.648404E-01	4.24825E+00	1.0709E+01	8.8257E+04	4.7468E-01	0.000E+00	7.521E+00
1.762144E-01	5.53947E+00	1.0481E+01	8.0809E+04	5.2921E-01	0.000E+00	7.036E+00
1.855140E-01	6.11355E+00	1.0223E+01	7.4867E+04	5.7387E-01	0.000E+00	6.683E+00
1.883732E-01	5.89518E+00	1.0134E+01	7.3090E+04	5.8758E-01	0.000E+00	6.582E+00
1.891107E-01	5.40553E+00	1.0111E+01	7.2637E+04	5.9112E-01	0.000E+00	6.556E+00
1.902465E-01	6.07332E+00	1.1179E+01	7.9834E+04	5.9656E-01	0.000E+00	6.517E+00
1.930860E-01	6.81272E+00	1.1093E+01	7.8054E+04	6.1016E-01	0.000E+00	6.421E+00
2.013709E-01	7.90149E+00	1.0828E+01	7.3050E+04	6.4973E-01	0.000E+00	6.157E+00
2.152655E-01	9.14404E+00	1.0352E+01	6.5334E+04	7.1556E-01	0.000E+00	5.760E+00
2.301188E-01	1.01493E+01	9.8221E+00	5.7988E+04	7.8489E-01	0.000E+00	5.388E+00
2.459970E-01	1.09897E+01	9.2561E+00	5.1119E+04	8.5753E-01	0.000E+00	5.040E+00
2.629708E-01	1.16948E+01	8.6714E+00	4.4799E+04	9.3320E-01	0.000E+00	4.715E+00
2.811158E-01	1.22841E+01	8.0814E+00	3.9056E+04	1.0116E+00	0.000E+00	4.410E+00
3.005128E-01	1.27723E+01	7.4974E+00	3.3895E+04	1.0923E+00	0.000E+00	4.126E+00
3.212482E-01	1.31729E+01	6.9286E+00	2.9302E+04	1.1750E+00	0.000E+00	3.859E+00
3.434143E-01	1.34977E+01	6.3813E+00	2.5245E+04	1.2591E+00	0.000E+00	3.610E+00
3.671099E-01	1.37575E+01	5.8599E+00	2.1686E+04	1.3442E+00	0.000E+00	3.377E+00
3.924405E-01	1.39617E+01	5.3671E+00	1.8580E+04	1.4297E+00	0.000E+00	3.159E+00
4.195189E-01	1.41172E+01	4.9045E+00	1.5883E+04	1.5151E+00	0.000E+00	2.955E+00
4.484657E-01	1.42345E+01	4.4727E+00	1.3549E+04	1.5996E+00	0.000E+00	2.765E+00
4.794098E-01	1.43183E+01	4.0715E+00	1.1538E+04	1.6828E+00	0.000E+00	2.586E+00
5.124891E-01	1.43744E+01	3.7002E+00	9.8091E+03	1.7640E+00	0.000E+00	2.419E+00
5.478508E-01	1.44075E+01	3.3577E+00	8.3264E+03	1.8426E+00	0.000E+00	2.263E+00
5.856525E-01	1.44230E+01	3.0418E+00	7.0562E+03	1.9179E+00	0.000E+00	2.117E+00
6.260625E-01	1.44202E+01	2.7517E+00	5.9712E+03	1.9894E+00	0.000E+00	1.980E+00
6.692609E-01	1.44036E+01	2.4862E+00	5.0469E+03	2.0565E+00	0.000E+00	1.853E+00
7.154399E-01	1.43758E+01	2.2441E+00	4.2614E+03	2.1186E+00	0.000E+00	1.733E+00
7.648052E-01	1.43390E+01	2.0239E+00	3.5952E+03	2.1753E+00	0.000E+00	1.621E+00
8.175768E-01	1.42948E+01	1.8239E+00	3.0309E+03	2.2261E+00	0.000E+00	1.516E+00
8.739896E-01	1.42446E+01	1.6428E+00	2.5536E+03	2.2706E+00	0.000E+00	1.419E+00
9.342948E-01	1.41907E+01	1.4792E+00	2.1509E+03	2.3085E+00	0.000E+00	1.327E+00
9.987612E-01	1.41474E+01	1.3319E+00	1.8117E+03	2.3396E+00	0.000E+00	1.241E+00
1.067676E+00	1.40846E+01	1.1806E+00	1.5023E+03	2.3635E+00	0.000E+00	1.161E+00
1.141345E+00	1.40043E+01	1.0473E+00	1.2467E+03	2.3803E+00	0.000E+00	1.086E+00
1.220098E+00	1.39140E+01	9.3000E-01	1.0356E+03	2.3897E+00	0.000E+00	1.016E+00
1.304285E+00	1.38136E+01	8.2665E-01	8.6106E+02	2.3919E+00	0.000E+00	9.506E-01
1.394281E+00	1.37007E+01	7.3553E-01	7.1669E+02	2.3870E+00	0.000E+00	8.892E-01
1.490486E+00	1.35703E+01	6.5511E-01	5.9714E+02	2.3750E+00	0.000E+00	8.318E-01
1.593329E+00	1.34131E+01	5.8408E-01	4.9803E+02	2.3562E+00	0.000E+00	7.781E-01
1.703269E+00	1.32121E+01	5.2128E-01	4.1579E+02	2.3308E+00	0.000E+00	7.279E-01
1.820795E+00	1.29304E+01	4.6570E-01	3.4748E+02	2.2991E+00	0.000E+00	6.809E-01
1.946430E+00	1.24678E+01	4.1646E-01	2.9068E+02	2.2617E+00	0.000E+00	6.370E-01
2.080733E+00	1.13134E+01	3.7279E-01	2.4341E+02	2.2187E+00	0.000E+00	5.959E-01
2.102590E+00	1.08633E+01	3.6641E-01	2.3676E+02	2.2115E+00	0.000E+00	5.897E-01
2.134772E+00	9.28431E+00	3.5735E-01	2.2742E+02	2.2008E+00	0.000E+00	5.808E-01
2.143354E+00	7.39192E+00	3.5500E-01	2.2502E+02	2.1980E+00	0.000E+00	5.785E-01
2.156227E+00	9.29308E+00	4.0785E+00	2.5698E+03	2.1937E+00	2.348E+03	5.750E-01
2.188410E+00	1.10202E+01	4.0118E+00	2.4906E+03	2.1829E+00	2.278E+03	5.665E-01
2.224304E+00	1.18112E+01	3.9399E+00	2.4065E+03	2.1707E+00	2.202E+03	5.574E-01
2.377781E+00	1.32998E+01	3.5859E+00	2.0489E+03	2.1182E+00	1.878E+03	5.214E-01
2.541848E+00	1.40078E+01	3.2218E+00	1.7220E+03	2.0616E+00	1.578E+03	4.878E-01
2.717235E+00	1.44377E+01	2.8870E+00	1.4435E+03	2.0014E+00	1.323E+03	4.563E-01
2.904724E+00	1.47250E+01	2.5936E+00	1.2131E+03	1.9383E+00	1.112E+03	4.268E-01
3.105150E+00	1.49354E+01	2.3252E+00	1.0178E+03	1.8725E+00	9.341E+02	3.993E-01
3.319406E+00	1.50821E+01	2.2080E+00	8.5156E+02	1.8048E+00	7.824E+02	3.735E-01
3.548445E+00	1.51854E+01	2.0861E+00	7.1257E+02	1.7355E+00	6.553E+02	3.494E-01
3.793288E+00	1.52583E+01	1.6640E+00	5.9597E+02	1.6653E+00	5.489E+02	3.269E-01
4.055024E+00	1.53093E+01	1.4879E+00	4.9849E+02	1.5944E+00	4.597E+02	3.058E-01

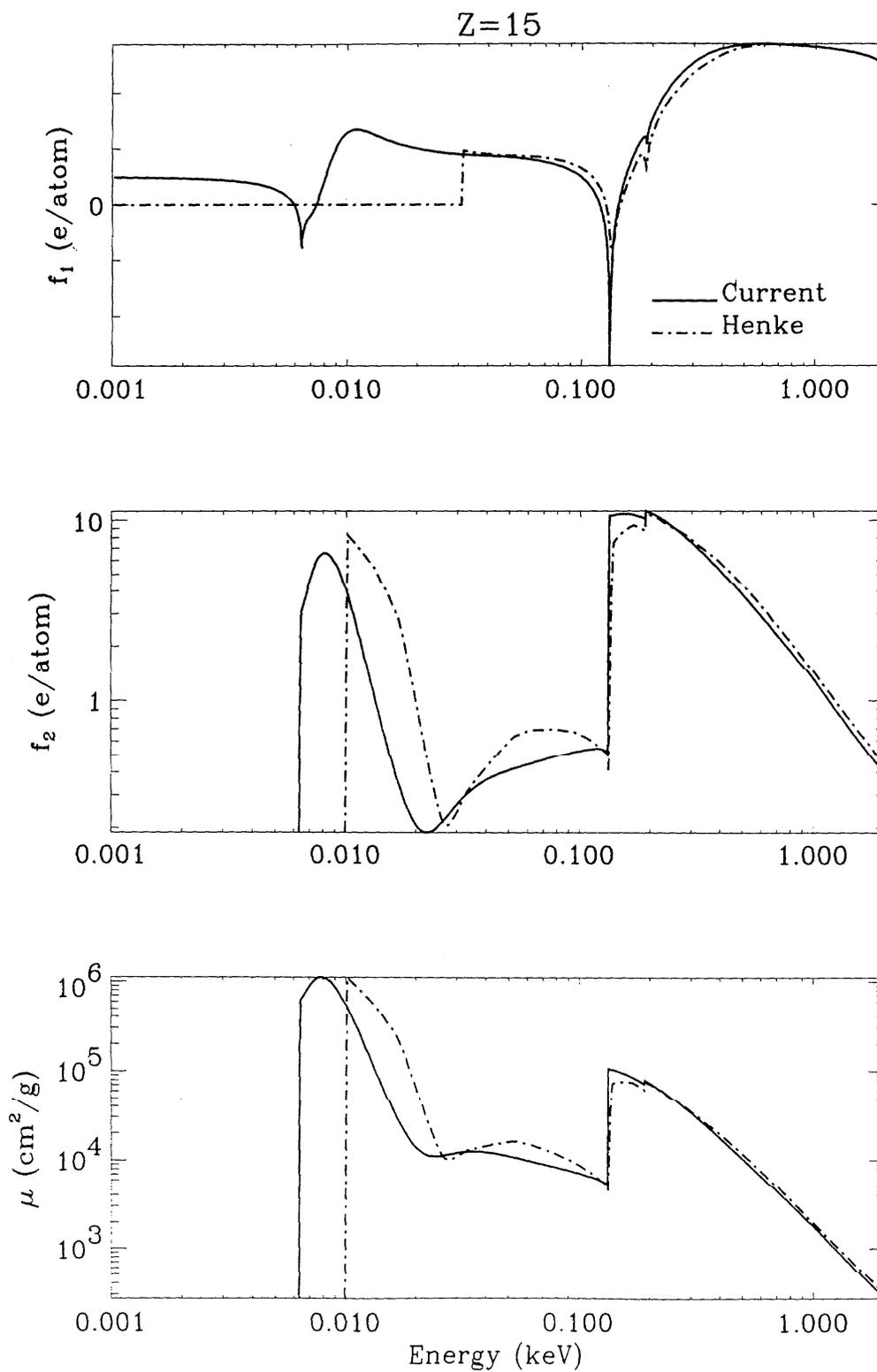
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 157

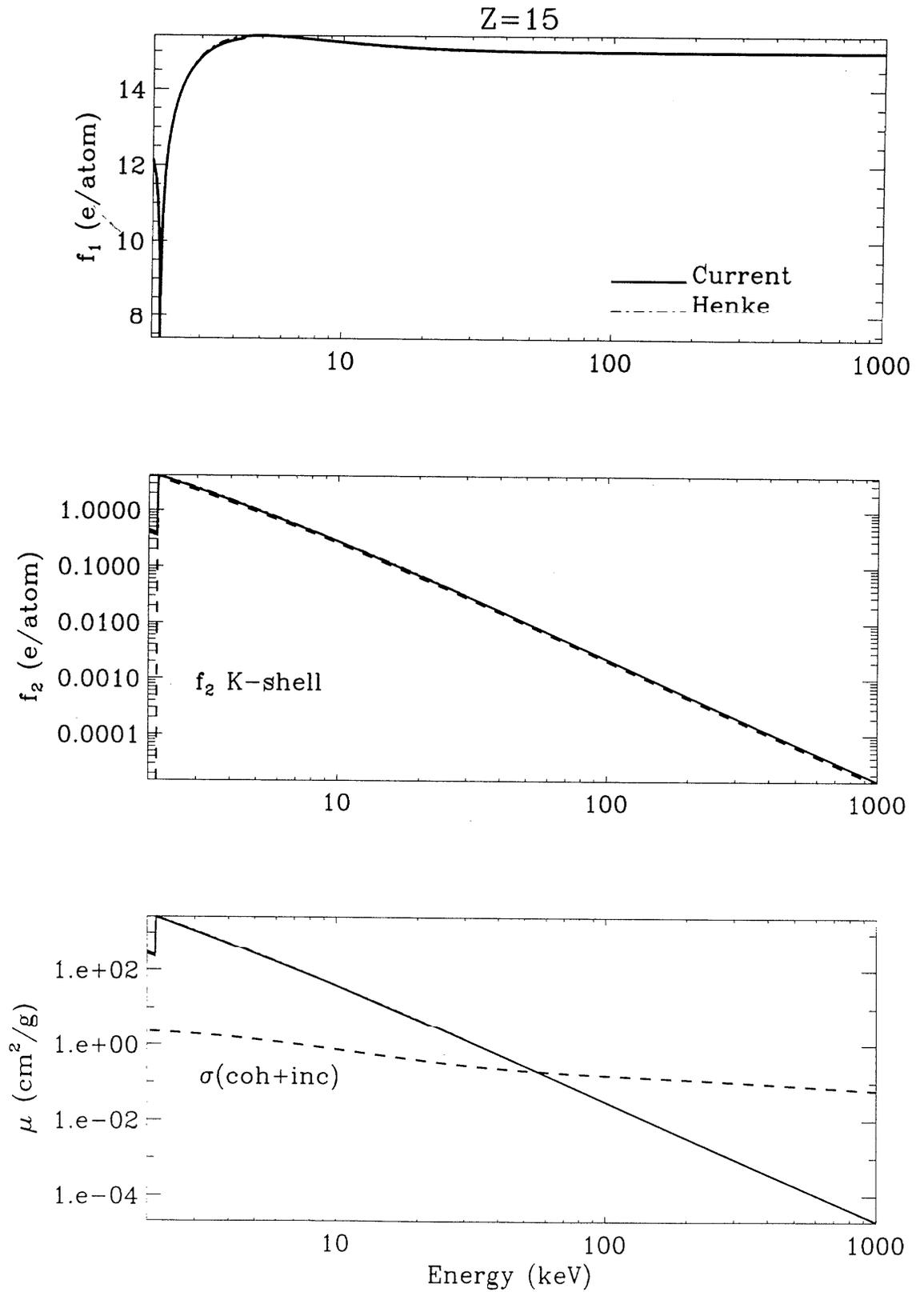
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.334821E+00	1.53912E+01	1.3284E+00	4.1634E+02	1.5234E+00	3.844E+02	2.860E-01
4.633924E+00	1.54105E+01	1.1761E+00	3.4481E+02	1.4526E+00	3.185E+02	2.676E-01
4.953664E+00	1.54155E+01	1.0413E+00	2.8558E+02	1.3825E+00	2.639E+02	2.503E-01
5.295467E+00	1.54114E+01	9.2199E-01	2.3654E+02	1.3134E+00	2.186E+02	2.341E-01
5.660855E+00	1.54013E+01	8.1640E-01	1.9593E+02	1.2456E+00	1.811E+02	2.190E-01
6.051453E+00	1.53871E+01	7.2293E-01	1.6230E+02	1.1793E+00	1.501E+02	2.049E-01
6.469004E+00	1.53703E+01	6.4020E-01	1.3445E+02	1.1149E+00	1.243E+02	1.917E-01
6.915365E+00	1.53519E+01	5.6693E-01	1.1138E+02	1.0526E+00	1.030E+02	1.793E-01
7.392525E+00	1.53326E+01	5.0207E-01	9.2268E+01	9.9245E-01	8.535E+01	1.677E-01
7.902609E+00	1.53133E+01	4.4464E-01	7.6440E+01	9.3467E-01	7.071E+01	1.569E-01
8.447890E+00	1.52943E+01	3.9380E-01	6.3330E+01	8.7935E-01	5.858E+01	1.468E-01
9.030794E+00	1.52766E+01	3.4826E-01	5.2391E+01	8.2659E-01	4.847E+01	1.373E-01
9.653919E+00	1.52590E+01	3.0528E-01	4.2962E+01	7.7642E-01	3.977E+01	1.284E-01
1.032004E+01	1.52404E+01	2.6689E-01	3.5135E+01	7.2889E-01	3.253E+01	1.201E-01
1.103212E+01	1.52220E+01	2.3334E-01	2.8735E+01	6.8399E-01	2.661E+01	1.124E-01
1.179334E+01	1.52041E+01	2.0401E-01	2.3502E+01	6.4171E-01	2.176E+01	1.051E-01
1.260708E+01	1.51870E+01	1.7838E-01	1.9222E+01	6.0201E-01	1.780E+01	9.834E-02
1.347697E+01	1.51710E+01	1.5596E-01	1.5722E+01	5.6483E-01	1.456E+01	9.200E-02
1.440688E+01	1.51559E+01	1.3637E-01	1.2860E+01	5.3012E-01	1.191E+01	8.606E-02
1.540095E+01	1.51419E+01	1.1924E-01	1.0519E+01	4.9779E-01	9.741E+00	8.050E-02
1.646362E+01	1.51290E+01	1.0427E-01	8.6043E+00	4.6775E-01	7.968E+00	7.531E-02
1.759961E+01	1.51170E+01	9.1177E-02	7.0383E+00	4.3990E-01	6.517E+00	7.045E-02
1.881398E+01	1.51061E+01	7.9731E-02	5.7575E+00	4.1414E-01	5.331E+00	6.590E-02
2.011215E+01	1.50960E+01	6.9723E-02	4.7098E+00	3.9036E-01	4.360E+00	6.165E-02
2.149988E+01	1.50869E+01	6.0972E-02	3.8528E+00	3.6845E-01	3.567E+00	5.767E-02
2.298338E+01	1.50785E+01	5.3321E-02	3.1519E+00	3.4830E-01	2.917E+00	5.395E-02
2.456923E+01	1.50710E+01	4.6630E-02	2.5785E+00	3.2979E-01	2.386E+00	5.046E-02
2.626450E+01	1.50642E+01	4.0780E-02	2.1094E+00	3.1282E-01	1.952E+00	4.721E-02
2.807676E+01	1.50579E+01	3.5454E-02	1.7155E+00	2.9726E-01	1.587E+00	4.416E-02
3.001405E+01	1.50521E+01	3.0764E-02	1.3925E+00	2.8302E-01	1.289E+00	4.131E-02
3.208502E+01	1.50469E+01	2.6694E-02	1.1303E+00	2.6999E-01	1.046E+00	3.864E-02
3.429889E+01	1.50421E+01	2.3164E-02	9.1751E-01	2.5807E-01	8.492E-01	3.615E-02
3.666551E+01	1.50377E+01	2.0100E-02	7.4477E-01	2.4716E-01	6.893E-01	3.381E-02
3.919543E+01	1.50338E+01	1.7442E-02	6.0456E-01	2.3717E-01	5.596E-01	3.163E-02
4.189922E+01	1.50303E+01	1.5135E-02	4.9075E-01	2.2802E-01	4.543E-01	2.959E-02
4.479101E+01	1.50271E+01	1.3134E-02	3.9837E-01	2.1963E-01	3.688E-01	2.768E-02
4.788159E+01	1.50242E+01	1.1368E-02	3.2254E-01	2.1192E-01	2.985E-01	2.589E-02
5.118542E+01	1.50216E+01	9.8273E-03	2.6084E-01	2.0482E-01	2.413E-01	2.422E-02
5.471721E+01	1.50193E+01	8.4957E-03	2.1094E-01	1.9827E-01	1.951E-01	2.266E-02
5.849270E+01	1.50172E+01	7.3447E-03	1.7059E-01	1.9220E-01	1.577E-01	2.120E-02
6.252870E+01	1.50154E+01	6.3496E-03	1.3796E-01	1.8656E-01	1.275E-01	1.983E-02
6.684318E+01	1.50137E+01	5.4893E-03	1.1157E-01	1.8130E-01	1.031E-01	1.855E-02
7.145536E+01	1.50122E+01	4.7457E-03	9.0229E-02	1.7638E-01	8.335E-02	1.735E-02
7.638578E+01	1.50108E+01	4.1028E-03	7.2971E-02	1.7175E-01	6.739E-02	1.623E-02
8.165640E+01	1.50096E+01	3.5473E-03	5.9019E-02	1.6738E-01	5.448E-02	1.518E-02
8.729069E+01	1.50085E+01	3.0675E-03	4.7742E-02	1.6323E-01	4.404E-02	1.420E-02
9.331374E+01	1.50076E+01	2.6527E-03	3.8621E-02	1.5928E-01	3.561E-02	1.329E-02
9.975239E+01	1.50067E+01	2.2940E-03	3.1242E-02	1.5549E-01	2.879E-02	1.243E-02
1.066353E+02	1.50060E+01	1.9838E-03	2.5274E-02	1.5185E-01	2.327E-02	1.163E-02
1.139931E+02	1.50053E+01	1.7155E-03	2.0446E-02	1.4834E-01	1.882E-02	1.088E-02
1.218587E+02	1.50047E+01	1.4836E-03	1.6540E-02	1.4493E-01	1.521E-02	1.017E-02
1.302669E+02	1.50042E+01	1.2830E-03	1.3381E-02	1.4162E-01	1.230E-02	9.518E-03
1.392553E+02	1.50037E+01	1.1096E-03	1.0825E-02	1.3839E-01	9.943E-03	8.903E-03
1.488640E+02	1.50033E+01	9.5957E-04	8.7573E-03	1.3522E-01	8.038E-03	8.329E-03
1.591356E+02	1.50029E+01	8.2986E-04	7.0847E-03	1.3212E-01	6.499E-03	7.791E-03
1.701159E+02	1.50026E+01	7.1769E-04	5.7316E-03	1.2907E-01	5.254E-03	7.288E-03
1.818539E+02	1.50023E+01	6.2069E-04	4.6370E-03	1.2607E-01	4.247E-03	6.818E-03
1.944018E+02	1.50020E+01	5.3680E-04	3.7514E-03	1.2310E-01	3.434E-03	6.378E-03
2.078156E+02	1.50018E+01	4.6426E-04	3.0350E-03	1.2018E-01	2.776E-03	5.966E-03
2.221548E+02	1.50016E+01	4.0152E-04	2.4555E-03	1.1729E-01	2.244E-03	5.581E-03
2.374835E+02	1.50014E+01	3.4726E-04	1.9866E-03	1.1443E-01	1.815E-03	5.221E-03
2.538699E+02	1.50012E+01	3.0034E-04	1.6073E-03	1.1161E-01	1.467E-03	4.884E-03
2.713869E+02	1.50011E+01	2.5976E-04	1.3004E-03	1.0882E-01	1.186E-03	4.569E-03
2.901126E+02	1.50010E+01	2.2466E-04	1.0521E-03	1.0606E-01	9.588E-04	4.274E-03
3.101304E+02	1.50008E+01	1.9431E-04	8.5122E-04	1.0333E-01	7.752E-04	3.998E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
3.315294E+02	1.50007E+01	1.6806E-04	6.8870E-04	1.0063E-01	6.267E-04	3.740E-03
3.544049E+02	1.50007E+01	1.4536E-04	5.5722E-04	9.7965E-02	5.067E-04	3.498E-03
3.788588E+02	1.50006E+01	1.2572E-04	4.5084E-04	9.5333E-02	4.096E-04	3.273E-03
4.050001E+02	1.50005E+01	1.0874E-04	3.6478E-04	9.2737E-02	3.312E-04	3.061E-03
4.329451E+02	1.50005E+01	9.4055E-05	2.9514E-04	9.0177E-02	2.677E-04	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 161

S Z= 16

Atomic weight = 3.206000E+01 g/mol, nominal density ρ (g/cm³) = 2.0700E+00

μ_r (barns/atom) = μ (cm²/g) \times 5.32369E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.31255E+06

σ edges. Edge energies (keV):

K 2.47200E+00 L I 2.29200E-00 L II 1.64800E-00 L III 1.64800E-01
 M I 1.76882E-02 M II 7.81363E-03 M III 7.73488E-03
 Relativistic correction estimate f_{rel} (H82,3/5CL) = -3.5338E-02, -2.1000E-02 e/atom
 Nuclear Thomson correction f_{NT} = -4.3804E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
7.580180E-03	-3.48343E+00	0.0000E+00	0.0000E+00	2.2563E-05	0.000E+00	1.636E+02
7.657359E-03	-4.26512E+00	0.0000E+00	0.0000E+00	2.3751E-05	0.000E+00	1.619E+02
7.696204E-03	-4.91639E+00	0.0000E+00	0.0000E+00	2.4366E-05	0.000E+00	1.611E+02
7.727143E-03	-6.07961E+00	0.0000E+00	0.0000E+00	2.4865E-05	0.000E+00	1.605E+02
7.774563E-03	-5.80548E+00	1.7889E+00	3.0201E+05	2.5645E-05	0.000E+00	1.595E+02
7.805818E-03	-6.49112E+00	1.8360E+00	3.0873E+05	2.6168E-05	0.000E+00	1.588E+02
7.852700E-03	-5.51019E+00	3.6918E+00	6.1706E+05	2.6969E-05	0.000E+00	1.579E+02
7.889576E-03	-5.10778E+00	3.8061E+00	6.3320E+05	2.7611E-05	0.000E+00	1.571E+02
7.969904E-03	-4.68850E+00	4.0655E+00	6.6954E+05	2.9050E-05	0.000E+00	1.556E+02
1.069000E-02	4.85407E+00	1.0046E+01	1.2334E+06	1.1968E-04	0.000E+00	1.160E+02
1.142761E-02	7.02455E+00	8.6428E+00	9.9270E+05	1.6262E-04	0.000E+00	1.085E+02
1.221612E-02	8.29260E+00	6.8704E+00	7.3818E+05	2.1974E-04	0.000E+00	1.015E+02
1.305903E-02	8.79689E+00	5.1618E+00	5.1881E+05	2.9530E-04	0.000E+00	9.494E+01
1.396010E-02	8.78922E+00	3.7368E+00	3.7368E+05	3.9467E-04	0.000E+00	8.881E+01
1.492335E-02	8.50205E+00	2.6492E+00	2.3300E+05	5.2463E-04	0.000E+00	8.308E+01
1.595306E-02	8.09906E+00	1.8642E+00	1.5338E+05	6.9362E-04	0.000E+00	7.772E+01
1.705382E-02	7.67610E+00	1.3165E+00	1.0132E+05	9.1215E-04	0.000E+00	7.270E+01
1.733447E-02	7.57568E+00	1.2110E+00	9.1697E+04	9.7457E-04	0.000E+00	7.152E+01
1.759979E-02	7.48403E+00	1.1213E+00	8.3627E+04	1.0362E-03	0.000E+00	7.045E+01
1.767054E-02	7.46005E+00	1.0989E+00	8.1627E+04	1.0531E-03	0.000E+00	7.016E+01
1.777667E-02	7.42486E+00	1.0667E+00	7.8762E+04	1.0787E-03	0.000E+00	6.975E+01
1.804199E-02	7.33908E+00	9.9108E-01	7.2101E+04	1.1447E-03	0.000E+00	6.872E+01
1.823053E-02	7.28016E+00	9.4176E-01	6.7804E+04	1.1932E-03	0.000E+00	6.801E+01
1.948844E-02	6.92902E+00	6.8765E-01	4.6314E+04	1.5525E-03	0.000E+00	6.362E+01
2.083314E-02	6.62473E+00	5.1689E-01	3.2566E+04	2.0095E-03	0.000E+00	5.951E+01
2.227063E-02	6.36305E+00	4.0433E-01	2.3830E+04	2.5874E-03	0.000E+00	5.567E+01
2.380730E-02	6.13733E+00	3.3392E-01	1.8410E+04	3.3143E-03	0.000E+00	5.208E+01
2.545001E-02	5.94417E+00	2.9544E-01	1.5237E+04	4.2236E-03	0.000E+00	4.872E+01
2.720606E-02	5.77933E+00	2.8174E-01	1.3592E+04	5.3550E-03	0.000E+00	4.557E+01
2.908327E-02	5.64047E+00	2.8698E-01	1.2951E+04	6.7549E-03	0.000E+00	4.263E+01
3.109002E-02	5.52557E+00	3.0570E-01	1.2906E+04	8.4779E-03	0.000E+00	3.988E+01
3.323523E-02	5.43223E+00	3.3304E-01	1.3153E+04	1.0587E-02	0.000E+00	3.731E+01
3.552846E-02	5.35763E+00	3.6459E-01	1.3469E+04	1.3156E-02	0.000E+00	3.490E+01
3.797993E-02	5.29818E+00	3.9668E-01	1.3709E+04	1.6267E-02	0.000E+00	3.264E+01
4.060054E-02	5.24989E+00	4.2687E-01	1.3800E+04	2.0015E-02	0.000E+00	3.054E+01
4.340198E-02	5.20867E+00	4.5409E-01	1.3733E+04	2.4507E-02	0.000E+00	2.857E+01
4.639671E-02	5.17122E+00	4.7795E-01	1.3521E+04	2.9862E-02	0.000E+00	2.672E+01
4.959809E-02	5.13443E+00	4.9862E-01	1.3195E+04	3.6214E-02	0.000E+00	2.500E+01
5.302035E-02	5.09561E+00	5.1680E-01	1.2794E+04	4.3707E-02	0.000E+00	2.338E+01
5.667876E-02	5.05383E+00	5.3333E-01	1.2351E+04	5.2502E-02	0.000E+00	2.187E+01
6.058959E-02	5.00445E+00	5.4903E-01	1.1894E+04	6.2770E-02	0.000E+00	2.046E+01
6.477028E-02	4.94551E+00	5.6524E-01	1.1454E+04	7.4698E-02	0.000E+00	1.914E+01
6.923942E-02	4.87744E+00	5.8227E-01	1.1038E+04	8.8482E-02	0.000E+00	1.791E+01
7.401695E-02	4.79720E+00	6.0028E-01	1.0645E+04	1.0433E-01	0.000E+00	1.675E+01
7.912411E-02	4.70176E+00	6.1932E-01	1.0274E+04	1.2246E-01	0.000E+00	1.567E+01
8.458368E-02	4.58711E+00	6.3925E-01	9.9198E+03	1.4308E-01	0.000E+00	1.466E+01
9.041995E-02	4.44776E+00	6.5975E-01	9.5770E+03	1.6643E-01	0.000E+00	1.371E+01
9.665893E-02	4.27591E+00	6.8034E-01	9.2384E+03	1.9274E-01	0.000E+00	1.283E+01
1.033284E-01	4.06018E+00	7.0045E-01	8.8977E+03	2.2221E-01	0.000E+00	1.200E+01
1.104581E-01	3.78344E+00	7.1950E-01	8.5497E+03	2.5507E-01	0.000E+00	1.122E+01
1.180797E-01	3.41854E+00	7.3688E-01	8.1910E+03	2.9152E-01	0.000E+00	1.050E+01
1.262272E-01	2.91916E+00	7.5205E-01	7.8200E+03	3.3175E-01	0.000E+00	9.822E+00
1.349368E-01	2.19699E+00	7.6456E-01	7.4370E+03	3.7591E-01	0.000E+00	9.188E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.442475E-01	1.05025E+00	7.7408E-01	7.0436E+03	4.2415E-01	0.000E+00	8.595E+00
1.542005E-01	-1.18249E+00	7.6165E-01	6.4831E+03	4.7656E-01	0.000E+00	8.040E+00
1.615040E-01	-5.49062E+00	7.4766E-01	6.0763E+03	5.1541E-01	0.000E+00	7.677E+00
1.639760E-01	-1.08763E+01	7.4264E-01	5.9445E+03	5.2861E-01	0.000E+00	7.561E+00
1.646352E-01	-1.72556E+01	7.4128E-01	5.9098E+03	5.3213E-01	0.000E+00	7.531E+00
1.648404E-01	-2.28517E+01	1.3291E+01	1.0583E+05	5.3323E-01	0.000E+00	7.521E+00
1.656240E-01	-1.07387E+01	1.3261E+01	1.0509E+05	5.3742E-01	0.000E+00	7.486E+00
1.680960E-01	-5.05078E+00	1.3165E+01	1.0280E+05	5.5065E-01	0.000E+00	7.376E+00
1.762144E-01	2.68651E-01	1.2863E+01	9.5814E+04	5.9416E-01	0.000E+00	7.036E+00
1.883732E-01	3.57484E+00	1.2429E+01	8.6606E+04	6.5935E-01	0.000E+00	6.582E+00
2.013709E-01	5.64507E+00	1.1923E+01	7.7717E+04	7.2872E-01	0.000E+00	6.157E+00
2.152655E-01	7.05788E+00	1.1353E+01	6.9225E+04	8.0215E-01	0.000E+00	5.760E+00
2.246160E-01	7.51754E+00	1.0965E+01	6.4072E+04	8.5098E-01	0.000E+00	5.520E+00
2.280540E-01	7.27360E+00	1.0822E+01	6.2285E+04	8.6879E-01	0.000E+00	5.437E+00
2.289708E-01	6.72984E+00	1.0784E+01	6.1818E+04	8.7353E-01	0.000E+00	5.415E+00
2.301188E-01	7.35124E+00	1.1942E+01	6.8112E+04	8.7945E-01	0.000E+00	5.388E+00
2.303460E-01	7.45350E+00	1.1933E+01	6.7994E+04	8.8062E-01	0.000E+00	5.383E+00
2.337840E-01	8.24499E+00	1.1797E+01	6.6233E+04	8.9830E-01	0.000E+00	5.303E+00
2.459970E-01	9.56827E+00	1.1322E+01	6.0411E+04	9.6039E-01	0.000E+00	5.040E+00
2.629708E-01	1.07717E+01	1.0685E+01	5.3330E+04	1.0447E+00	0.000E+00	4.715E+00
2.811158E-01	1.17286E+01	1.0032E+01	4.6840E+04	1.1319E+00	0.000E+00	4.410E+00
3.005128E-01	1.25150E+01	9.3747E+00	4.0946E+04	1.2217E+00	0.000E+00	4.126E+00
3.212482E-01	1.31657E+01	8.7232E+00	3.5641E+04	1.3136E+00	0.000E+00	3.859E+00
3.434143E-01	1.37032E+01	8.0847E+00	3.0900E+04	1.4071E+00	0.000E+00	3.610E+00
3.671099E-01	1.41439E+01	7.4660E+00	2.6694E+04	1.5016E+00	0.000E+00	3.377E+00
3.924405E-01	1.45017E+01	6.8727E+00	2.2986E+04	1.5965E+00	0.000E+00	3.159E+00
4.195189E-01	1.47886E+01	6.3084E+00	1.9737E+04	1.6912E+00	0.000E+00	2.955E+00
4.484657E-01	1.50149E+01	5.7755E+00	1.6904E+04	1.7850E+00	0.000E+00	2.765E+00
4.794098E-01	1.51896E+01	5.2754E+00	1.4443E+04	1.8771E+00	0.000E+00	2.586E+00
5.124891E-01	1.53221E+01	4.8084E+00	1.2315E+04	1.9670E+00	0.000E+00	2.419E+00
5.478508E-01	1.54165E+01	4.3745E+00	1.0480E+04	2.0540E+00	0.000E+00	2.263E+00
5.856525E-01	1.54802E+01	3.9729E+00	8.9041E+03	2.1372E+00	0.000E+00	2.117E+00
6.260625E-01	1.55185E+01	3.6027E+00	7.5531E+03	2.2162E+00	0.000E+00	1.980E+00
6.692609E-01	1.55359E+01	3.2623E+00	6.3980E+03	2.2902E+00	0.000E+00	1.853E+00
7.154399E-01	1.55359E+01	2.9496E+00	5.4113E+03	2.3587E+00	0.000E+00	1.733E+00
7.648052E-01	1.55214E+01	2.6633E+00	4.5707E+03	2.4211E+00	0.000E+00	1.621E+00
8.175768E-01	1.54951E+01	2.4023E+00	3.8567E+03	2.4769E+00	0.000E+00	1.516E+00
8.739896E-01	1.54600E+01	2.1653E+00	3.2518E+03	2.5257E+00	0.000E+00	1.419E+00
9.342948E-01	1.54191E+01	1.9505E+00	2.7402E+03	2.5672E+00	0.000E+00	1.327E+00
9.987612E-01	1.53770E+01	1.7565E+00	2.3083E+03	2.6010E+00	0.000E+00	1.241E+00
1.067676E+00	1.53185E+01	1.5563E+00	1.9132E+03	2.6269E+00	0.000E+00	1.161E+00
1.141345E+00	1.52465E+01	1.3799E+00	1.5869E+03	2.6448E+00	0.000E+00	1.086E+00
1.220098E+00	1.51657E+01	1.2248E+00	1.3176E+03	2.6546E+00	0.000E+00	1.016E+00
1.304285E+00	1.50779E+01	1.0883E+00	1.0952E+03	2.6564E+00	0.000E+00	9.506E-01
1.394281E+00	1.49834E+01	9.6802E-01	9.1127E+02	2.6502E+00	0.000E+00	8.892E-01
1.490486E+00	1.48807E+01	8.6197E-01	7.5906E+02	2.6362E+00	0.000E+00	8.318E-01
1.593329E+00	1.47671E+01	7.6836E-01	6.3296E+02	2.6146E+00	0.000E+00	7.781E-01
1.703269E+00	1.46378E+01	6.8566E-01	5.2838E+02	2.5858E+00	0.000E+00	7.279E-01
1.820795E+00	1.44842E+01	6.1253E-01	4.4155E+02	2.5501E+00	0.000E+00	6.809E-01
1.946430E+00	1.42907E+01	5.4778E-01	3.6939E+02	2.5079E+00	0.000E+00	6.370E-01
2.080733E+00	1.40245E+01	4.9041E-01	3.0935E+02	2.4596E+00	0.000E+00	5.959E-01
2.224304E+00	1.35997E+01	4.3931E-01	2.5935E+02	2.4058E+00	0.000E+00	5.574E-01
2.377781E+00	1.26322E+01	3.9431E-01	2.1766E+02	2.3469E+00	0.000E+00	5.214E-01
2.422560E+00	1.19404E+01	3.8259E-01	2.0729E+02	2.3296E+00	0.000E+00	5.118E-01
2.459640E+00	1.03757E+01	3.7333E-01	1.9922E+02	2.3153E+00	0.000E+00	5.041E-01
2.469578E+00	8.49659E+00	3.7093E-01	1.9715E+02	2.3115E+00	0.000E+00	5.021E-01
2.484360E+00	1.03922E+01	4.0700E+00	2.1503E+03	2.3058E+00	1.956E+03	4.991E-01
2.521440E+00	1.21135E+01	3.9926E+00	2.0784E+03	2.2915E+00	1.892E+03	4.917E-01
2.541848E+00	1.25569E+01	3.9512E+00	2.0403E+03	2.2836E+00	1.857E+03	4.878E-01
2.717235E+00	1.42376E+01	3.5845E+00	1.7315E+03	2.2163E+00	1.578E+03	4.563E-01
2.904724E+00	1.49741E+01	3.2216E+00	1.4557E+03	2.1458E+00	1.326E+03	4.268E-01
3.105150E+00	1.54198E+01	2.8955E+00	1.2239E+03	2.0724E+00	1.116E+03	3.993E-01
3.319406E+00	1.57231E+01	2.5973E+00	1.0270E+03	1.9968E+00	9.378E+02	3.735E-01
3.548445E+00	1.59311E+01	2.3237E+00	8.5953E+02	1.9196E+00	7.858E+02	3.494E-01
3.793288E+00	1.60769E+01	2.0792E+00	7.1943E+02	1.8412E+00	6.584E+02	3.269E-01

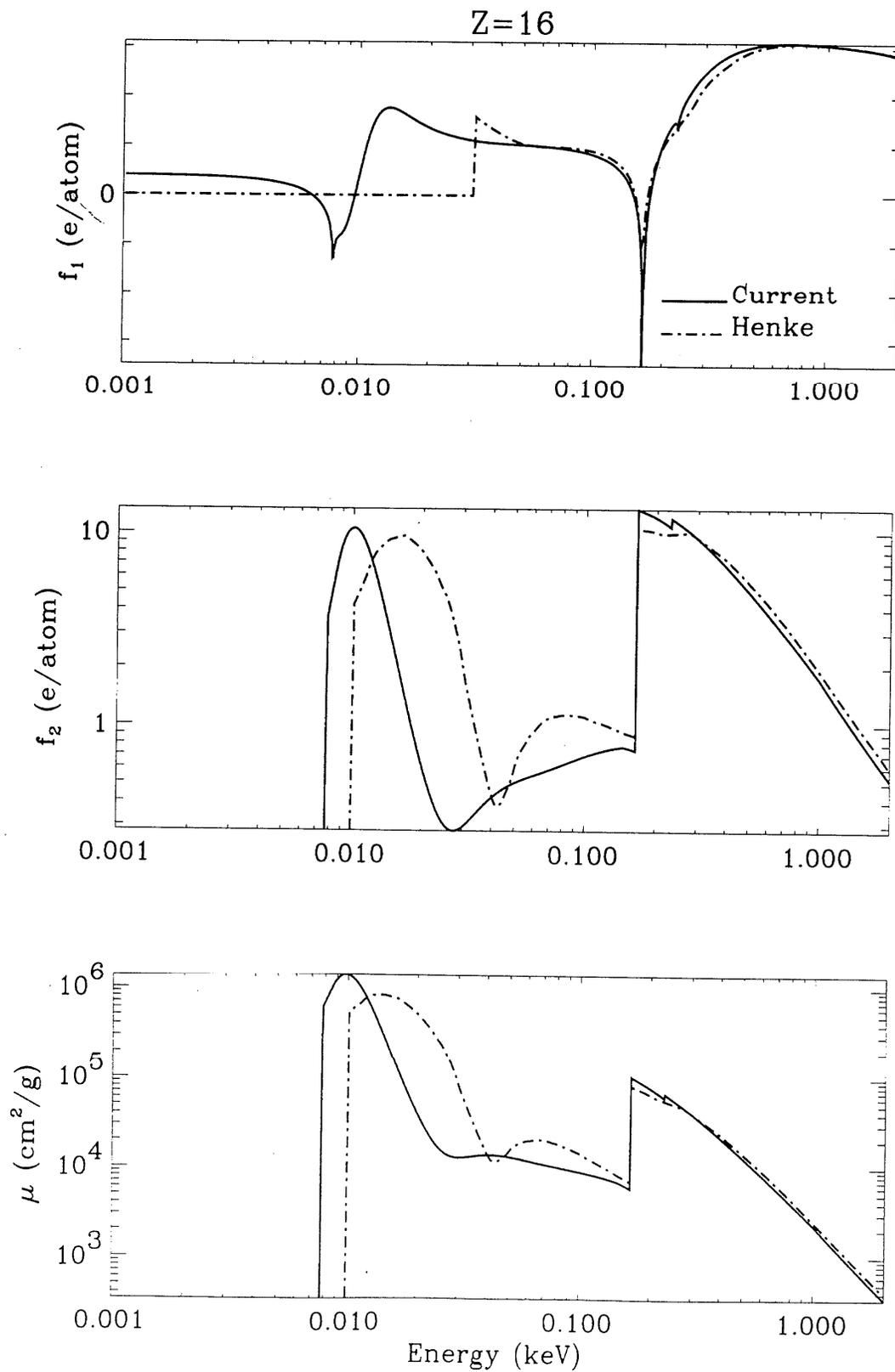
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 163

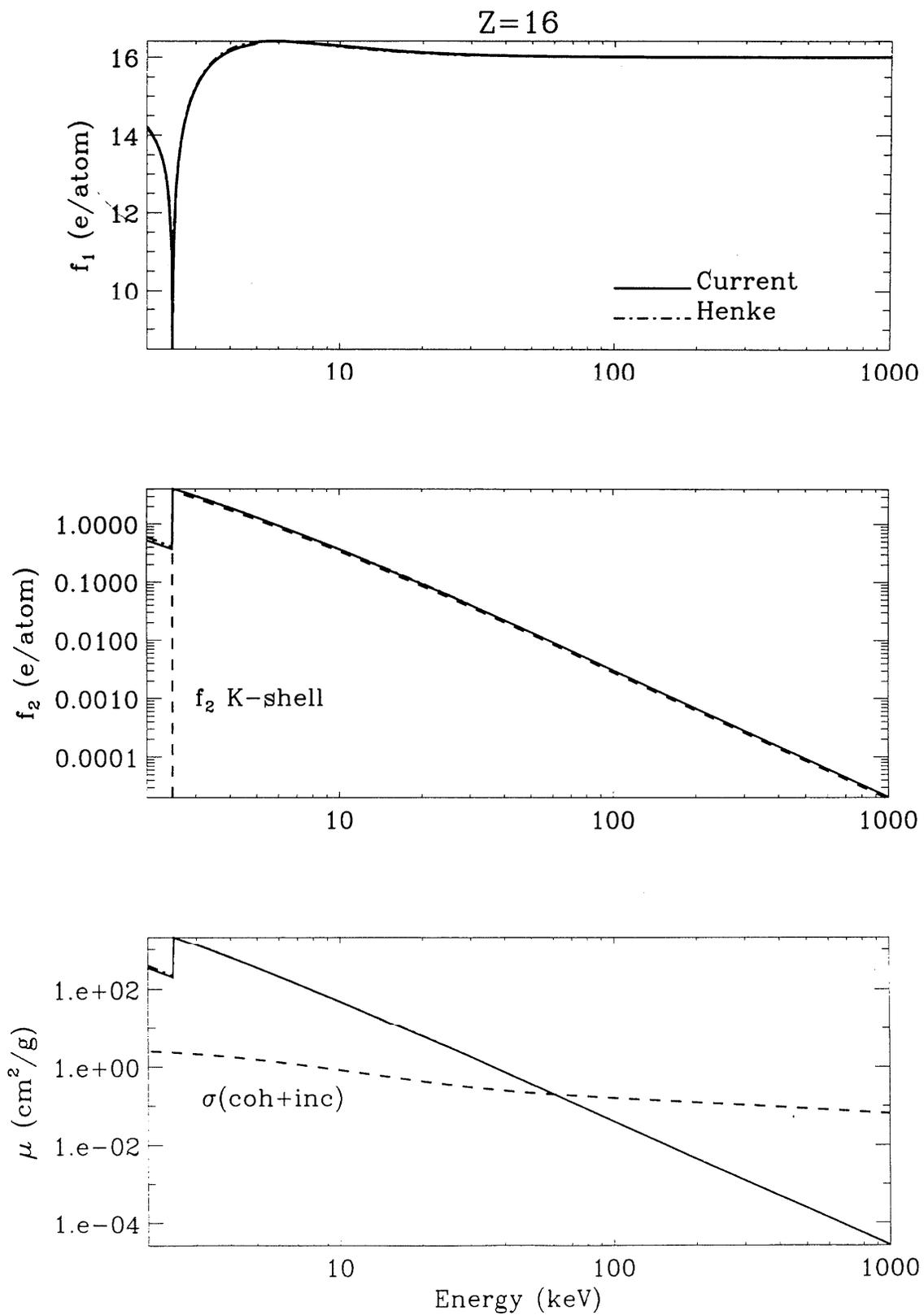
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
4.055024E+00	1.61802E+01	1.8606E+00	6.0224E+02	1.7623E+00	5.517E+02	3.058E-01
4.334821E+00	1.62533E+01	1.6650E+00	5.0415E+02	1.6832E+00	4.623E+02	2.860E-01
4.633924E+00	1.63047E+01	1.4893E+00	4.2183E+02	1.6044E+00	3.873E+02	2.676E-01
4.953664E+00	1.63850E+01	1.3318E+00	3.5289E+02	1.5264E+00	3.244E+02	2.503E-01
5.295467E+00	1.64057E+01	1.1801E+00	2.9250E+02	1.4494E+00	2.690E+02	2.341E-01
5.660855E+00	1.64117E+01	1.0457E+00	2.4247E+02	1.3740E+00	2.231E+02	2.190E-01
6.051453E+00	1.64086E+01	9.2670E-01	2.0100E+02	1.3003E+00	1.850E+02	2.049E-01
6.469004E+00	1.63993E+01	8.2127E-01	1.6663E+02	1.2287E+00	1.534E+02	1.917E-01
6.915365E+00	1.63859E+01	7.2786E-01	1.3815E+02	1.1594E+00	1.272E+02	1.793E-01
7.392525E+00	1.63698E+01	6.4511E-01	1.1454E+02	1.0926E+00	1.055E+02	1.677E-01
7.902609E+00	1.63522E+01	5.7180E-01	9.4970E+01	1.0283E+00	8.749E+01	1.569E-01
8.447890E+00	1.63342E+01	5.0681E-01	7.8743E+01	9.6685E-01	7.255E+01	1.468E-01
9.030794E+00	1.63180E+01	4.4855E-01	6.5193E+01	9.0821E-01	6.008E+01	1.373E-01
9.653919E+00	1.62986E+01	3.9488E-01	5.3687E+01	8.5247E-01	4.951E+01	1.284E-01
1.032004E+01	1.62792E+01	3.4764E-01	4.4214E+01	7.9965E-01	4.080E+01	1.201E-01
1.103212E+01	1.62603E+01	3.0521E-01	3.6312E+01	7.4976E-01	3.353E+01	1.124E-01
1.179334E+01	1.62413E+01	2.6702E-01	2.9718E+01	7.0278E-01	2.744E+01	1.051E-01
1.260708E+01	1.62226E+01	2.3361E-01	2.4322E+01	6.5866E-01	2.246E+01	9.834E-02
1.347697E+01	1.62045E+01	2.0439E-01	1.9906E+01	6.1735E-01	1.838E+01	9.200E-02
1.440688E+01	1.61874E+01	1.7883E-01	1.6293E+01	5.7876E-01	1.504E+01	8.606E-02
1.540095E+01	1.61713E+01	1.5647E-01	1.3335E+01	5.4282E-01	1.231E+01	8.050E-02
1.646362E+01	1.61562E+01	1.3691E-01	1.0915E+01	5.0942E-01	1.008E+01	7.531E-02
1.759961E+01	1.61422E+01	1.1980E-01	8.9346E+00	4.7844E-01	8.249E+00	7.045E-02
1.881398E+01	1.61293E+01	1.0483E-01	7.3136E+00	4.4978E-01	6.751E+00	6.590E-02
2.011215E+01	1.61174E+01	9.1735E-02	5.9867E+00	4.2332E-01	5.526E+00	6.165E-02
2.149988E+01	1.61064E+01	8.0275E-02	4.9007E+00	3.9892E-01	4.522E+00	5.767E-02
2.298338E+01	1.60964E+01	7.0249E-02	4.0118E+00	3.7647E-01	3.702E+00	5.395E-02
2.456923E+01	1.60873E+01	6.1476E-02	3.2842E+00	3.5584E-01	3.030E+00	5.046E-02
2.626450E+01	1.60790E+01	5.3800E-02	2.6886E+00	3.3690E-01	2.480E+00	4.721E-02
2.807676E+01	1.60715E+01	4.6793E-02	2.1875E+00	3.1954E-01	2.017E+00	4.416E-02
3.001405E+01	1.60645E+01	4.0617E-02	1.7762E+00	3.0363E-01	1.638E+00	4.131E-02
3.208502E+01	1.60581E+01	3.5256E-02	1.4423E+00	2.8906E-01	1.330E+00	3.864E-02
3.429889E+01	1.60523E+01	3.0603E-02	1.1711E+00	2.7572E-01	1.080E+00	3.615E-02
3.666551E+01	1.60470E+01	2.6565E-02	9.5097E-01	2.6350E-01	8.772E-01	3.381E-02
3.919543E+01	1.60421E+01	2.3060E-02	7.7221E-01	2.5231E-01	7.123E-01	3.163E-02
4.189992E+01	1.60378E+01	2.0017E-02	6.2706E-01	2.4205E-01	5.784E-01	2.959E-02
4.479101E+01	1.60338E+01	1.7377E-02	5.0920E-01	2.3263E-01	4.697E-01	2.768E-02
4.788159E+01	1.60303E+01	1.5084E-02	4.1350E-01	2.2397E-01	3.814E-01	2.589E-02
5.118542E+01	1.60271E+01	1.3095E-02	3.3578E-01	2.1599E-01	3.097E-01	2.422E-02
5.471721E+01	1.60242E+01	1.1346E-02	2.7218E-01	2.0863E-01	2.510E-01	2.266E-02
5.849270E+01	1.60216E+01	9.8178E-03	2.2031E-01	2.0180E-01	2.031E-01	2.120E-02
6.252870E+01	1.60193E+01	8.4952E-03	1.7832E-01	1.9547E-01	1.644E-01	1.983E-02
6.684318E+01	1.60172E+01	7.3509E-03	1.4434E-01	1.8956E-01	1.330E-01	1.855E-02
7.145536E+01	1.60153E+01	6.3607E-03	1.1684E-01	1.8404E-01	1.076E-01	1.735E-02
7.638578E+01	1.60137E+01	5.5040E-03	9.4576E-02	1.7885E-01	8.707E-02	1.623E-02
8.165640E+01	1.60122E+01	4.7619E-03	7.6544E-02	1.7396E-01	7.046E-02	1.518E-02
8.729069E+01	1.60108E+01	4.1184E-03	6.1926E-02	1.6934E-01	5.701E-02	1.420E-02
9.331374E+01	1.60096E+01	3.5618E-03	5.0100E-02	1.6494E-01	4.613E-02	1.329E-02
9.975239E+01	1.60086E+01	3.0804E-03	4.0533E-02	1.6074E-01	3.733E-02	1.243E-02
1.066353E+02	1.60076E+01	2.6642E-03	3.2792E-02	1.5672E-01	3.021E-02	1.163E-02
1.139931E+02	1.60067E+01	2.3041E-03	2.6530E-02	1.5285E-01	2.444E-02	1.088E-02
1.218587E+02	1.60060E+01	1.9928E-03	2.1464E-02	1.4912E-01	1.978E-02	1.017E-02
1.302669E+02	1.60053E+01	1.7235E-03	1.7366E-02	1.4550E-01	1.600E-02	9.518E-03
1.392553E+02	1.60047E+01	1.4906E-03	1.4050E-02	1.4199E-01	1.295E-02	8.903E-03
1.488640E+02	1.60042E+01	1.2892E-03	1.1367E-02	1.3858E-01	1.048E-02	8.329E-03
1.591356E+02	1.60037E+01	1.1150E-03	9.1967E-03	1.3524E-01	8.478E-03	7.791E-03
1.701159E+02	1.60033E+01	9.6437E-04	7.4407E-03	1.3199E-01	6.860E-03	7.288E-03
1.818539E+02	1.60029E+01	8.3407E-04	6.0200E-03	1.2879E-01	5.551E-03	6.818E-03
1.944018E+02	1.60026E+01	7.2139E-04	4.8706E-03	1.2567E-01	4.492E-03	6.378E-03
2.078156E+02	1.60023E+01	6.2393E-04	3.9407E-03	1.2259E-01	3.635E-03	5.966E-03
2.221548E+02	1.60020E+01	5.3963E-04	3.1883E-03	1.1958E-01	2.941E-03	5.581E-03
2.374835E+02	1.60018E+01	4.6673E-04	2.5796E-03	1.1661E-01	2.380E-03	5.221E-03
2.538699E+02	1.60016E+01	4.0368E-04	2.0871E-03	1.1370E-01	1.926E-03	4.884E-03
2.713869E+02	1.60014E+01	3.4915E-04	1.6886E-03	1.1083E-01	1.558E-03	4.569E-03
2.901126E+02	1.60012E+01	3.0198E-04	1.3662E-03	1.0801E-01	1.261E-03	4.274E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_k cm ² /g	λ nm
3.101304E+02	1.60011E+01	2.6119E-04	1.1054E-03	1.0524E-01	1.020E-03	3.998E-03
3.315294E+02	1.60010E+01	2.2591E-04	8.9438E-04	1.0251E-01	8.255E-04	3.740E-03
3.544049E+02	1.60009E+01	1.9539E-04	7.2364E-04	9.9833E-02	6.680E-04	3.498E-03
3.788588E+02	1.60008E+01	1.6900E-04	5.8549E-04	9.7201E-02	5.405E-04	3.273E-03
4.050001E+02	1.60007E+01	1.4617E-04	4.7372E-04	9.4618E-02	4.374E-04	3.061E-03
4.329451E+02	1.60006E+01	1.2643E-04	3.8329E-04	9.2084E-02	3.539E-04	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 167

Cl Z = 17

Atomic weight = 3.545300E+01 g/mol, nominal density ρ (g/cm³) = 1.5600E+00

μ_{ph} (barns/atom) = μ (cm²/g) \times 5.88711E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.18693E+06

Edges. Edge energies (keV):

K 2.82240E+00 L I 2.70200E-00 L II 2.01600E-00 L III 2.00000E-01
M I 1.75000E-02 M II 6.80000E-03 M III 6.80000E-03
Relativistic correction estimate f_{rel} (H82,3/5CL) = -4.0526E-02, -2.4600E-02 e/atom
Nuclear Thomson correction f_{NT} = -4.4718E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{K} cm ² /g	λ nm
6.664000E-03	-6.48754E+00	0.0000E+00	0.0000E+00	1.6791E-05	0.000E+00	1.861E+02
6.766000E-03	-8.71036E+00	0.0000E+00	0.0000E+00	1.8145E-05	0.000E+00	1.832E+02
6.793200E-03	-1.09679E+01	0.0000E+00	0.0000E+00	1.8519E-05	0.000E+00	1.825E+02
6.834000E-03	-9.15794E+00	4.2153E+00	7.3211E+05	1.9092E-05	0.000E+00	1.814E+02
6.936000E-03	-7.81269E+00	4.6476E+00	7.9532E+05	2.0581E-05	0.000E+00	1.788E+02
1.069000E-02	8.13522E+00	1.0632E+01	1.1805E+06	1.6347E-04	0.000E+00	1.160E+02
1.142761E-02	9.37473E+00	8.5751E+00	8.9066E+05	2.2045E-04	0.000E+00	1.085E+02
1.221612E-02	9.87659E+00	6.6572E+00	6.4682E+05	2.9569E-04	0.000E+00	1.015E+02
1.305903E-02	9.88286E+00	5.0456E+00	4.5859E+05	3.9449E-04	0.000E+00	9.494E+01
1.396010E-02	9.60491E+00	3.7778E+00	3.2120E+05	5.2350E-04	0.000E+00	8.881E+01
1.492335E-02	9.19403E+00	2.8220E+00	2.2445E+05	6.9102E-04	0.000E+00	8.308E+01
1.595306E-02	8.74430E+00	2.1201E+00	1.5774E+05	9.0735E-04	0.000E+00	7.772E+01
1.705382E-02	8.30670E+00	1.6121E+00	1.1220E+05	1.1852E-03	0.000E+00	7.270E+01
1.715000E-02	8.27119E+00	1.5764E+00	1.0910E+05	1.2119E-03	0.000E+00	7.229E+01
1.741250E-02	8.17619E+00	1.4849E+00	1.0122E+05	1.2868E-03	0.000E+00	7.120E+01
1.748250E-02	8.15072E+00	1.4619E+00	9.9249E+04	1.3073E-03	0.000E+00	7.092E+01
1.758750E-02	8.11518E+00	1.4302E+00	9.6518E+04	1.3384E-03	0.000E+00	7.050E+01
1.785000E-02	8.02747E+00	1.3517E+00	8.9881E+04	1.4185E-03	0.000E+00	6.946E+01
1.823053E-02	7.90572E+00	1.2497E+00	8.1361E+04	1.5401E-03	0.000E+00	6.801E+01
1.948844E-02	7.54978E+00	9.9072E-01	6.0339E+04	1.9909E-03	0.000E+00	6.362E+01
2.083314E-02	7.24039E+00	8.0826E-01	4.6049E+04	2.5605E-03	0.000E+00	5.951E+01
2.227063E-02	6.97002E+00	6.8213E-01	3.6355E+04	3.2764E-03	0.000E+00	5.567E+01
2.380730E-02	6.73643E+00	5.9833E-01	2.9830E+04	4.1712E-03	0.000E+00	5.208E+01
2.545001E-02	6.53547E+00	5.4685E-01	2.5504E+04	5.2836E-03	0.000E+00	4.872E+01
2.720606E-02	6.36342E+00	5.2018E-01	2.2694E+04	6.6595E-03	0.000E+00	4.557E+01
2.908327E-02	6.21710E+00	5.1307E-01	2.0939E+04	8.3520E-03	0.000E+00	4.263E+01
3.109002E-02	6.09417E+00	5.2094E-01	1.9888E+04	1.0423E-02	0.000E+00	3.988E+01
3.323523E-02	5.99205E+00	5.3952E-01	1.9268E+04	1.2944E-02	0.000E+00	3.731E+01
3.552846E-02	5.90798E+00	5.6545E-01	1.8890E+04	1.5997E-02	0.000E+00	3.490E+01
3.797993E-02	5.83917E+00	5.9621E-01	1.8633E+04	1.9675E-02	0.000E+00	3.264E+01
4.060054E-02	5.78294E+00	6.3002E-01	1.8418E+04	2.4083E-02	0.000E+00	3.054E+01
4.340198E-02	5.73680E+00	6.6568E-01	1.8205E+04	2.9337E-02	0.000E+00	2.857E+01
4.639671E-02	5.69856E+00	7.0249E-01	1.7971E+04	3.5570E-02	0.000E+00	2.672E+01
4.959809E-02	5.66627E+00	7.4008E-01	1.7711E+04	4.2925E-02	0.000E+00	2.500E+01
5.302035E-02	5.64012E+00	7.7828E-01	1.7423E+04	5.1560E-02	0.000E+00	2.338E+01
5.667876E-02	5.61503E+00	8.1703E-01	1.7110E+04	6.1645E-02	0.000E+00	2.187E+01
6.058959E-02	5.59156E+00	8.5625E-01	1.6774E+04	7.3366E-02	0.000E+00	2.046E+01
6.477028E-02	5.56850E+00	8.9580E-01	1.6416E+04	8.6918E-02	0.000E+00	1.914E+01
6.923942E-02	5.54462E+00	9.3544E-01	1.6036E+04	1.0251E-01	0.000E+00	1.791E+01
7.401695E-02	5.51848E+00	9.7470E-01	1.5630E+04	1.2035E-01	0.000E+00	1.675E+01
7.912411E-02	5.48825E+00	1.0130E+00	1.5196E+04	1.4068E-01	0.000E+00	1.567E+01
8.458368E-02	5.45162E+00	1.0498E+00	1.4731E+04	1.6370E-01	0.000E+00	1.466E+01
9.041995E-02	5.40568E+00	1.0844E+00	1.4235E+04	1.8967E-01	0.000E+00	1.371E+01
9.665893E-02	5.34667E+00	1.1163E+00	1.3707E+04	2.1879E-01	0.000E+00	1.283E+01
1.033284E-01	5.26968E+00	1.1447E+00	1.3149E+04	2.5130E-01	0.000E+00	1.200E+01
1.104581E-01	5.16820E+00	1.1690E+00	1.2562E+04	2.8741E-01	0.000E+00	1.122E+01
1.180797E-01	5.03347E+00	1.1889E+00	1.1951E+04	3.2730E-01	0.000E+00	1.050E+01
1.262272E-01	4.85335E+00	1.2040E+00	1.1321E+04	3.7117E-01	0.000E+00	9.822E+00
1.349368E-01	4.60508E+00	1.1885E+00	1.0455E+04	4.1915E-01	0.000E+00	9.188E+00
1.442475E-01	4.24737E+00	1.1615E+00	9.5572E+03	4.7137E-01	0.000E+00	8.595E+00
1.542005E-01	3.72741E+00	1.1286E+00	8.6872E+03	5.2792E-01	0.000E+00	8.040E+00
1.648404E-01	2.94256E+00	1.0906E+00	7.8530E+03	5.8884E-01	0.000E+00	7.521E+00
1.762144E-01	1.65231E+00	1.0484E+00	7.0615E+03	6.5414E-01	0.000E+00	7.036E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.883732E-01	-9.63484E-01	1.0027E+00	6.3182E+03	7.2377E-01	0.000E+00	6.582E+00
1.960000E-01	-5.11596E+00	9.7436E-01	5.9005E+03	7.6719E-01	0.000E+00	6.326E+00
1.975680E-01	-7.04464E+00	9.6858E-01	5.8189E+03	7.7609E-01	0.000E+00	6.276E+00
1.990000E-01	-1.03536E+01	9.6331E-01	5.7457E+03	7.8421E-01	0.000E+00	6.230E+00
1.998000E-01	-1.58375E+01	9.6038E-01	5.7052E+03	7.8873E-01	0.000E+00	6.205E+00
2.005920E-01	-1.32492E+01	1.0701E+01	6.3321E+04	7.9321E-01	0.000E+00	6.181E+00
2.010000E-01	-1.23713E+01	1.0680E+01	6.3065E+04	7.9552E-01	0.000E+00	6.168E+00
2.013709E-01	-1.28311E+01	1.0660E+01	6.2834E+04	7.9762E-01	0.000E+00	6.157E+00
2.013984E-01	-1.29630E+01	1.0659E+01	6.2817E+04	7.9777E-01	0.000E+00	6.156E+00
2.026080E-01	-8.42225E+00	1.5407E+01	9.0257E+04	8.0460E-01	0.000E+00	6.119E+00
2.040000E-01	-5.64408E+00	1.5302E+01	8.9034E+04	8.1245E-01	0.000E+00	6.078E+00
2.056370E-01	-3.66881E+00	1.5182E+01	8.7632E+04	8.2164E-01	0.000E+00	6.029E+00
2.152655E-01	1.76525E+00	1.4507E+01	7.9989E+04	8.7554E-01	0.000E+00	5.760E+00
2.301188E-01	5.36699E+00	1.3570E+01	6.9995E+04	9.5731E-01	0.000E+00	5.388E+00
2.459970E-01	7.46894E+00	1.2673E+01	6.1145E+04	1.0427E+00	0.000E+00	5.040E+00
2.629708E-01	8.63568E+00	1.1807E+01	5.3290E+04	1.1313E+00	0.000E+00	4.715E+00
2.647960E-01	8.66322E+00	1.1719E+01	5.2528E+04	1.1406E+00	0.000E+00	4.682E+00
2.688490E-01	8.40100E+00	1.1526E+01	5.0887E+04	1.1613E+00	0.000E+00	4.612E+00
2.699298E-01	7.81491E+00	1.1476E+01	5.0461E+04	1.1668E+00	0.000E+00	4.593E+00
2.715510E-01	8.59454E+00	1.2699E+01	5.5507E+04	1.1750E+00	0.000E+00	4.566E+00
2.756040E-01	9.44336E+00	1.2518E+01	5.3911E+04	1.1953E+00	0.000E+00	4.499E+00
2.811158E-01	1.00833E+01	1.2278E+01	5.1842E+04	1.2227E+00	0.000E+00	4.410E+00
3.005128E-01	1.15368E+01	1.1490E+01	4.5380E+04	1.3166E+00	0.000E+00	4.126E+00
3.212482E-01	1.26019E+01	1.0723E+01	3.9620E+04	1.4124E+00	0.000E+00	3.859E+00
3.434143E-01	1.34520E+01	9.9762E+00	3.4481E+04	1.5095E+00	0.000E+00	3.610E+00
3.671099E-01	1.41442E+01	9.2522E+00	2.9914E+04	1.6074E+00	0.000E+00	3.377E+00
3.924405E-01	1.47107E+01	8.5551E+00	2.5875E+04	1.7055E+00	0.000E+00	3.159E+00
4.195189E-01	1.51732E+01	7.8877E+00	2.2316E+04	1.8030E+00	0.000E+00	2.955E+00
4.484657E-01	1.55481E+01	7.2524E+00	1.9195E+04	1.8992E+00	0.000E+00	2.765E+00
4.794098E-01	1.58486E+01	6.6510E+00	1.6467E+04	1.9936E+00	0.000E+00	2.586E+00
5.124891E-01	1.60858E+01	6.0847E+00	1.4092E+04	2.0853E+00	0.000E+00	2.419E+00
5.478508E-01	1.62691E+01	5.5541E+00	1.2033E+04	2.1736E+00	0.000E+00	2.263E+00
5.856525E-01	1.64066E+01	5.0594E+00	1.0254E+04	2.2580E+00	0.000E+00	2.117E+00
6.260623E-01	1.65034E+01	4.5999E+00	8.7209E+03	2.3376E+00	0.000E+00	1.980E+00
6.692609E-01	1.65699E+01	4.1750E+00	7.4043E+03	2.4120E+00	0.000E+00	1.853E+00
7.154399E-01	1.66094E+01	3.7833E+00	6.2766E+03	2.4804E+00	0.000E+00	1.733E+00
7.648052E-01	1.66268E+01	3.4235E+00	5.3131E+03	2.5424E+00	0.000E+00	1.621E+00
8.175768E-01	1.66272E+01	3.0938E+00	4.4915E+03	2.5975E+00	0.000E+00	1.516E+00
8.739896E-01	1.66118E+01	2.7921E+00	3.7919E+03	2.6453E+00	0.000E+00	1.419E+00
9.342948E-01	1.65843E+01	2.5173E+00	3.1980E+03	2.6854E+00	0.000E+00	1.327E+00
9.987612E-01	1.65482E+01	2.2683E+00	2.6956E+03	2.7175E+00	0.000E+00	1.241E+00
1.067676E+00	1.65280E+01	2.0210E+00	2.2467E+03	2.7415E+00	0.000E+00	1.161E+00
1.141345E+00	1.64667E+01	1.7948E+00	1.8665E+03	2.7572E+00	0.000E+00	1.086E+00
1.220098E+00	1.63923E+01	1.5940E+00	1.5507E+03	2.7646E+00	0.000E+00	1.016E+00
1.304285E+00	1.63103E+01	1.4171E+00	1.2896E+03	2.7637E+00	0.000E+00	9.506E-01
1.394281E+00	1.62230E+01	1.2611E+00	1.0736E+03	2.7547E+00	0.000E+00	8.892E-01
1.490486E+00	1.61307E+01	1.1235E+00	8.9466E+02	2.7378E+00	0.000E+00	8.318E-01
1.593329E+00	1.60330E+01	1.0019E+00	7.4632E+02	2.7131E+00	0.000E+00	7.781E-01
1.703269E+00	1.59283E+01	8.9432E-01	6.2321E+02	2.6811E+00	0.000E+00	7.279E-01
1.820795E+00	1.58134E+01	7.9917E-01	5.2096E+02	2.6421E+00	0.000E+00	6.809E-01
1.946430E+00	1.56835E+01	7.1488E-01	4.3593E+02	2.5965E+00	0.000E+00	6.370E-01
2.080733E+00	1.55299E+01	6.4014E-01	3.6516E+02	2.5448E+00	0.000E+00	5.959E-01
2.224304E+00	1.53369E+01	5.7382E-01	3.0620E+02	2.4876E+00	0.000E+00	5.574E-01
2.377781E+00	1.50720E+01	5.1489E-01	2.5702E+02	2.4253E+00	0.000E+00	5.214E-01
2.541848E+00	1.46490E+01	4.6250E-01	2.1597E+02	2.3585E+00	0.000E+00	4.878E-01
2.717235E+00	1.36771E+01	4.1585E-01	1.8165E+02	2.2879E+00	0.000E+00	4.563E-01
2.765952E+00	1.30165E+01	4.0432E-01	1.7350E+02	2.2685E+00	0.000E+00	4.483E-01
2.808288E+00	1.14668E+01	3.9473E-01	1.6683E+02	2.2517E+00	0.000E+00	4.415E-01
2.819578E+00	9.60284E+00	3.9224E-01	1.6512E+02	2.2473E+00	0.000E+00	4.397E-01
2.836512E+00	1.14882E+01	4.0625E+00	1.7000E+03	2.2406E+00	1.537E+03	4.371E-01
2.878848E+00	1.32000E+01	3.9785E+00	1.6403E+03	2.2240E+00	1.484E+03	4.307E-01
2.904724E+00	1.36816E+01	3.9285E+00	1.6053E+03	2.2139E+00	1.452E+03	4.268E-01
3.105150E+00	1.53069E+01	3.5410E+00	1.3535E+03	2.1372E+00	1.226E+03	3.993E-01
3.319406E+00	1.60198E+01	3.1795E+00	1.1369E+03	2.0584E+00	1.031E+03	3.735E-01
3.548445E+00	1.64430E+01	2.8622E+00	9.5738E+02	1.9779E+00	8.699E+02	3.494E-01

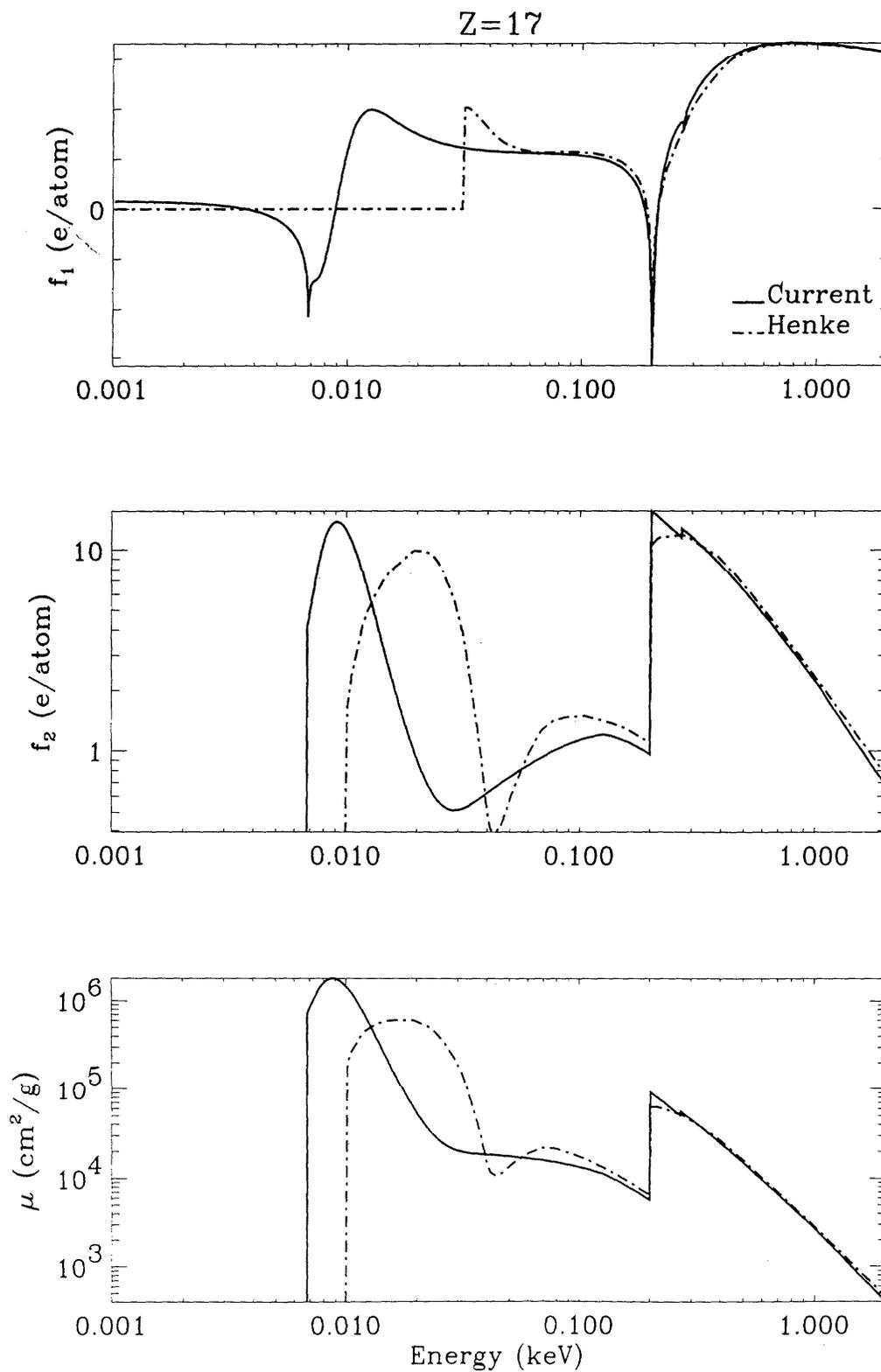
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 169

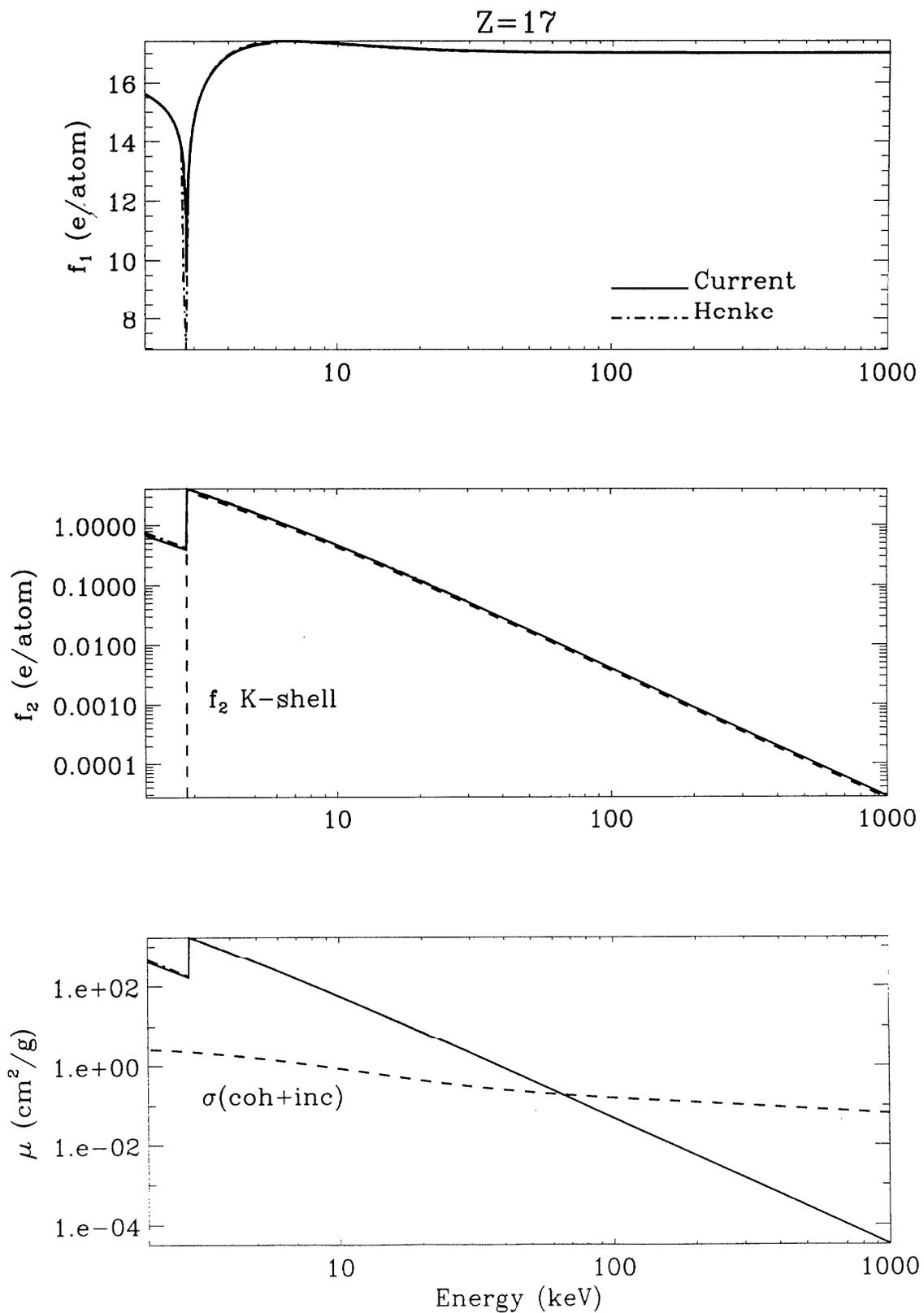
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
3.793288E+00	1.67430E+01	2.5699E+00	8.0413E+02	1.8964E+00	7.317E+02	3.269E-01
4.055024E+00	1.69472E+01	2.2984E+00	6.7276E+02	1.8143E+00	6.128E+02	3.058E-01
4.334821E+00	1.70895E+01	2.0558E+00	5.6291E+02	1.7322E+00	5.133E+02	2.860E-01
4.633924E+00	1.71898E+01	1.8390E+00	4.7105E+02	1.6505E+00	4.299E+02	2.676E-01
4.953664E+00	1.72603E+01	1.6453E+00	3.9422E+02	1.5697E+00	3.601E+02	2.503E-01
5.295467E+00	1.73095E+01	1.4714E+00	3.2981E+02	1.4900E+00	3.016E+02	2.341E-01
5.660855E+00	1.73868E+01	1.3153E+00	2.7578E+02	1.4119E+00	2.525E+02	2.190E-01
6.051453E+00	1.74057E+01	1.1664E+00	2.2878E+02	1.3357E+00	2.096E+02	2.049E-01
6.469004E+00	1.74110E+01	1.0345E+00	1.8980E+02	1.2617E+00	1.740E+02	1.917E-01
6.915365E+00	1.74076E+01	9.1748E-01	1.5747E+02	1.1900E+00	1.444E+02	1.793E-01
7.392525E+00	1.73984E+01	8.1377E-01	1.3066E+02	1.1209E+00	1.198E+02	1.677E-01
7.902609E+00	1.73854E+01	7.2183E-01	1.0841E+02	1.0545E+00	9.946E+01	1.569E-01
8.447890E+00	1.73702E+01	6.4026E-01	8.9957E+01	9.9094E-01	8.255E+01	1.468E-01
9.030794E+00	1.73541E+01	5.6708E-01	7.4532E+01	9.3033E-01	6.842E+01	1.373E-01
9.653919E+00	1.73362E+01	4.9958E-01	6.1423E+01	8.7271E-01	5.643E+01	1.284E-01
1.032004E+01	1.73166E+01	4.4014E-01	5.0622E+01	8.1810E-01	4.654E+01	1.201E-01
1.103212E+01	1.72966E+01	3.8779E-01	4.1722E+01	7.6650E-01	3.839E+01	1.124E-01
1.179334E+01	1.72769E+01	3.4169E-01	3.4389E+01	7.1791E-01	3.166E+01	1.051E-01
1.260708E+01	1.72579E+01	3.0019E-01	2.8262E+01	6.7226E-01	2.603E+01	9.834E-02
1.347697E+01	1.72389E+01	2.6280E-01	2.3145E+01	6.2950E-01	2.132E+01	9.200E-02
1.440688E+01	1.72202E+01	2.3008E-01	1.8956E+01	5.8955E-01	1.746E+01	8.606E-02
1.540095E+01	1.72023E+01	2.0144E-01	1.5525E+01	5.5231E-01	1.430E+01	8.050E-02
1.646362E+01	1.71853E+01	1.7637E-01	1.2716E+01	5.1769E-01	1.171E+01	7.531E-02
1.759961E+01	1.71694E+01	1.5443E-01	1.0415E+01	4.8558E-01	9.589E+00	7.045E-02
1.881398E+01	1.71545E+01	1.3522E-01	8.5307E+00	4.5584E-01	7.853E+00	6.590E-02
2.011215E+01	1.71407E+01	1.1840E-01	6.9876E+00	4.2837E-01	6.431E+00	6.165E-02
2.149988E+01	1.71279E+01	1.0368E-01	5.7238E+00	4.0303E-01	5.267E+00	5.767E-02
2.298338E+01	1.71161E+01	9.0790E-02	4.6887E+00	3.7970E-01	4.314E+00	5.395E-02
2.456923E+01	1.71054E+01	7.9504E-02	3.8408E+00	3.5825E-01	3.533E+00	5.046E-02
2.626450E+01	1.70955E+01	6.9623E-02	3.1464E+00	3.3855E-01	2.893E+00	4.721E-02
2.807676E+01	1.70867E+01	6.0598E-02	2.5618E+00	3.2048E-01	2.356E+00	4.416E-02
3.001405E+01	1.70785E+01	5.2638E-02	2.0816E+00	3.0391E-01	1.914E+00	4.131E-02
3.208502E+01	1.70709E+01	4.5724E-02	1.6915E+00	2.8873E-01	1.556E+00	3.864E-02
3.429889E+01	1.70639E+01	3.9719E-02	1.3745E+00	2.7483E-01	1.264E+00	3.615E-02
3.666551E+01	1.70575E+01	3.4503E-02	1.1169E+00	2.6209E-01	1.027E+00	3.381E-02
3.919543E+01	1.70517E+01	2.9972E-02	9.0764E-01	2.5042E-01	8.348E-01	3.163E-02
4.189992E+01	1.70464E+01	2.6037E-02	7.3757E-01	2.3972E-01	6.784E-01	2.959E-02
4.479101E+01	1.70416E+01	2.2619E-02	5.9939E-01	2.2990E-01	5.513E-01	2.768E-02
4.788159E+01	1.70373E+01	1.9650E-02	4.8709E-01	2.2087E-01	4.480E-01	2.589E-02
5.118542E+01	1.70334E+01	1.7070E-02	3.9584E-01	2.1256E-01	3.641E-01	2.422E-02
5.471721E+01	1.70299E+01	1.4830E-02	3.2169E-01	2.0489E-01	2.958E-01	2.266E-02
5.849270E+01	1.70267E+01	1.2883E-02	2.6143E-01	1.9780E-01	2.404E-01	2.120E-02
6.252870E+01	1.70239E+01	1.1169E-02	2.1201E-01	1.9122E-01	1.949E-01	1.983E-02
6.684318E+01	1.70214E+01	9.6669E-03	1.7166E-01	1.8510E-01	1.578E-01	1.855E-02
7.145536E+01	1.70191E+01	8.3672E-03	1.3899E-01	1.7939E-01	1.277E-01	1.735E-02
7.638578E+01	1.70170E+01	7.2424E-03	1.1254E-01	1.7404E-01	1.033E-01	1.623E-02
8.165640E+01	1.70151E+01	6.2681E-03	9.1112E-02	1.6901E-01	8.364E-02	1.518E-02
8.729069E+01	1.70135E+01	5.4237E-03	7.3749E-02	1.6426E-01	6.769E-02	1.420E-02
9.331374E+01	1.70120E+01	4.6931E-03	5.9695E-02	1.5976E-01	5.478E-02	1.329E-02
9.975239E+01	1.70107E+01	4.0609E-03	4.8320E-02	1.5548E-01	4.434E-02	1.243E-02
1.066353E+02	1.70095E+01	3.5139E-03	3.9113E-02	1.5139E-01	3.589E-02	1.163E-02
1.139931E+02	1.70084E+01	3.0406E-03	3.1660E-02	1.4748E-01	2.904E-02	1.088E-02
1.218587E+02	1.70075E+01	2.6311E-03	2.5627E-02	1.4371E-01	2.351E-02	1.017E-02
1.302669E+02	1.70067E+01	2.2767E-03	2.0744E-02	1.4008E-01	1.903E-02	9.518E-03
1.392553E+02	1.70059E+01	1.9701E-03	1.6792E-02	1.3657E-01	1.540E-02	8.903E-03
1.488640E+02	1.70052E+01	1.7048E-03	1.3592E-02	1.3317E-01	1.246E-02	8.329E-03
1.591356E+02	1.70047E+01	1.4752E-03	1.1003E-02	1.2986E-01	1.009E-02	7.791E-03
1.701159E+02	1.70041E+01	1.2765E-03	8.9064E-03	1.2664E-01	8.164E-03	7.288E-03
1.818539E+02	1.70037E+01	1.1046E-03	7.2096E-03	1.2350E-01	6.607E-03	6.818E-03
1.944018E+02	1.70032E+01	9.5585E-04	5.8360E-03	1.2042E-01	5.348E-03	6.378E-03
2.078156E+02	1.70029E+01	8.2714E-04	4.7242E-03	1.1742E-01	4.328E-03	5.966E-03
2.221548E+02	1.70025E+01	7.1576E-04	3.8242E-03	1.1448E-01	3.503E-03	5.581E-03
2.374835E+02	1.70022E+01	6.1938E-04	3.0956E-03	1.1160E-01	2.835E-03	5.221E-03
2.538699E+02	1.70020E+01	5.3598E-04	2.5059E-03	1.0878E-01	2.295E-03	4.884E-03
2.713869E+02	1.70018E+01	4.6381E-04	2.0285E-03	1.0601E-01	1.857E-03	4.569E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.901126E+02	1.70016E+01	4.0136E-04	1.6421E-03	1.0330E-01	1.503E-03	4.274E-03
3.101304E+02	1.70014E+01	3.4732E-04	1.3293E-03	1.0064E-01	1.216E-03	3.998E-03
3.315294E+02	1.70012E+01	3.0056E-04	1.0761E-03	9.8034E-02	9.846E-04	3.740E-03
3.544049E+02	1.70011E+01	2.6009E-04	8.7107E-04	9.5479E-02	7.969E-04	3.498E-03
3.788588E+02	1.70010E+01	2.2508E-04	7.0514E-04	9.2976E-02	6.449E-04	3.273E-03
4.050001E+02	1.70008E+01	1.9477E-04	5.7082E-04	9.0525E-02	5.220E-04	3.061E-03
4.329451E+02	1.70007E+01	1.6855E-04	4.6209E-04	8.8126E-02	4.225E-04	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 173

Ar Z= 18

Atomic weight = 3.994800E+01 g/mol, nominal density ρ (g/cm³) = 1.6600E-03

μ_a (barns/atom) = μ (cm²/g) \times 6.63353E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.05338E+06

edges. Edge energies (keV):

K 3.20290E+00 L I 3.20000E-00 L II 2.47300E-00 L III 2.45200E-01
 M I 2.53000E-02 M II 1.24000E-02 M III 1.24000E-02
 Relativistic correction estimate f_{rel} (H82.3/3CL) = -4.6144E-02, -2.8200E-02 e/atom
 Nuclear Thomson correction f_{NT} = -4.4493E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	-2.55688E+00	0.0000E+00	0.0000E+00	2.0878E-04	0.000E+00	1.160E+02
1.142761E-02	-4.00996E+00	0.0000E+00	0.0000E+00	2.7977E-04	0.000E+00	1.085E+02
1.215200E-02	-7.07227E+00	0.0000E+00	0.0000E+00	3.6463E-04	0.000E+00	1.020E+02
1.221612E-02	-7.64770E+00	0.0000E+00	0.0000E+00	3.7292E-04	0.000E+00	1.015E+02
1.233800E-02	-9.53105E+00	0.0000E+00	0.0000E+00	3.8904E-04	0.000E+00	1.005E+02
1.238760E-02	-1.19746E+01	0.0000E+00	0.0000E+00	3.9573E-04	0.000E+00	1.001E+02
1.246200E-02	-1.00930E+01	4.5247E+00	3.8246E+05	4.0593E-04	0.000E+00	9.949E+01
1.264800E-02	-8.75530E+00	5.0555E+00	4.2104E+05	4.3221E-04	0.000E+00	9.803E+01
1.305903E-02	-8.32095E+00	6.4235E+00	5.1814E+05	4.9447E-04	0.000E+00	9.494E+01
1.396010E-02	-7.63879E+00	1.0449E+01	7.8846E+05	6.5222E-04	0.000E+00	8.881E+01
1.492335E-02	-4.68957E+00	1.4367E+01	1.0141E+06	8.5584E-04	0.000E+00	8.308E+01
1.595306E-02	-1.84234E-01	1.6500E+01	1.0895E+06	1.1172E-03	0.000E+00	7.772E+01
1.705382E-02	4.52316E+00	1.6433E+01	1.0150E+06	1.4510E-03	0.000E+00	7.270E+01
1.823053E-02	8.33043E+00	1.4663E+01	8.4723E+05	1.8750E-03	0.000E+00	6.801E+01
1.948844E-02	1.07845E+01	1.2053E+01	6.5147E+05	2.4105E-03	0.000E+00	6.362E+01
2.083314E-02	1.19786E+01	9.3462E+00	4.7257E+05	3.0835E-03	0.000E+00	5.951E+01
2.227063E-02	1.22589E+01	6.9752E+00	3.2992E+05	3.9247E-03	0.000E+00	5.567E+01
2.380730E-02	1.19916E+01	5.0945E+00	2.2541E+05	4.9706E-03	0.000E+00	5.208E+01
2.479400E-02	1.16829E+01	4.1883E+00	1.7794E+05	5.7254E-03	0.000E+00	5.001E+01
2.517350E-02	1.15494E+01	3.8917E+00	1.6285E+05	6.0335E-03	0.000E+00	4.925E+01
2.527470E-02	1.15101E+01	3.8170E+00	1.5908E+05	6.1173E-03	0.000E+00	4.905E+01
2.545001E-02	1.14521E+01	3.6993E+00	1.5311E+05	6.2643E-03	0.000E+00	4.872E+01
2.580600E-02	1.13281E+01	3.4612E+00	1.4128E+05	6.5693E-03	0.000E+00	4.804E+01
2.720606E-02	1.08349E+01	2.6975E+00	1.0444E+05	7.8561E-03	0.000E+00	4.557E+01
2.908327E-02	1.02231E+01	1.9988E+00	7.2397E+04	9.8046E-03	0.000E+00	4.263E+01
3.109002E-02	9.66544E+00	1.5200E+00	5.1499E+04	1.2177E-02	0.000E+00	3.988E+01
3.323523E-02	9.17783E+00	1.1966E+00	3.7927E+04	1.5052E-02	0.000E+00	3.731E+01
3.552846E-02	8.76122E+00	9.8222E-01	2.9122E+04	1.8516E-02	0.000E+00	3.490E+01
3.797993E-02	8.40482E+00	8.4376E-01	2.3402E+04	2.2671E-02	0.000E+00	3.264E+01
4.060054E-02	8.11116E+00	7.5813E-01	1.9670E+04	2.7627E-02	0.000E+00	3.054E+01
4.340198E-02	7.86667E+00	7.0911E-01	1.7210E+04	3.3510E-02	0.000E+00	2.857E+01
4.639671E-02	7.66343E+00	6.8529E-01	1.5559E+04	4.0458E-02	0.000E+00	2.672E+01
4.959809E-02	7.49416E+00	6.7864E-01	1.4413E+04	4.8622E-02	0.000E+00	2.500E+01
5.302035E-02	7.35244E+00	6.8408E-01	1.3591E+04	5.8168E-02	0.000E+00	2.338E+01
5.667876E-02	7.23317E+00	6.9799E-01	1.2972E+04	6.9272E-02	0.000E+00	2.187E+01
6.058959E-02	7.13172E+00	7.1754E-01	1.2475E+04	8.2124E-02	0.000E+00	2.046E+01
6.477028E-02	7.04399E+00	7.4100E-01	1.2051E+04	9.6928E-02	0.000E+00	1.914E+01
6.923942E-02	6.96644E+00	7.6735E-01	1.1674E+04	1.1389E-01	0.000E+00	1.791E+01
7.401695E-02	6.89605E+00	7.9601E-01	1.1328E+04	1.3324E-01	0.000E+00	1.675E+01
7.912411E-02	6.83218E+00	8.2669E-01	1.1006E+04	1.5519E-01	0.000E+00	1.567E+01
8.458368E-02	6.76853E+00	8.5920E-01	1.0700E+04	1.7998E-01	0.000E+00	1.466E+01
9.041995E-02	6.70486E+00	8.9335E-01	1.0407E+04	2.0782E-01	0.000E+00	1.371E+01
9.665893E-02	6.63892E+00	9.2887E-01	1.0123E+04	2.3896E-01	0.000E+00	1.283E+01
1.033284E-01	6.56824E+00	9.6534E-01	9.8412E+03	2.7359E-01	0.000E+00	1.200E+01
1.104581E-01	6.48974E+00	1.0020E+00	9.5558E+03	3.1193E-01	0.000E+00	1.122E+01
1.180797E-01	6.39944E+00	1.0382E+00	9.2618E+03	3.5415E-01	0.000E+00	1.050E+01
1.262272E-01	6.29218E+00	1.0731E+00	8.9551E+03	4.0044E-01	0.000E+00	9.822E+00
1.349368E-01	6.16102E+00	1.1058E+00	8.6324E+03	4.5091E-01	0.000E+00	9.188E+00
1.442475E-01	5.99631E+00	1.1354E+00	8.2914E+03	5.0568E-01	0.000E+00	8.595E+00
1.542005E-01	5.78428E+00	1.1610E+00	7.9312E+03	5.6481E-01	0.000E+00	8.040E+00
1.648404E-01	5.50443E+00	1.1819E+00	7.5524E+03	6.2834E-01	0.000E+00	7.521E+00
1.762144E-01	5.12448E+00	1.1973E+00	7.1571E+03	6.9623E-01	0.000E+00	7.036E+00
1.883732E-01	4.58949E+00	1.2069E+00	6.7488E+03	7.6842E-01	0.000E+00	6.582E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.013709E-01	3.79424E+00	1.2104E+00	6.3316E+03	8.4479E-01	0.000E+00	6.157E+00
2.152655E-01	2.49575E+00	1.2079E+00	5.9107E+03	9.2515E-01	0.000E+00	5.760E+00
2.301188E-01	-1.13261E-01	1.1996E+00	5.4912E+03	1.0093E+00	0.000E+00	5.388E+00
2.402960E-01	-4.75294E+00	1.1754E+00	5.1527E+03	1.0657E+00	0.000E+00	5.160E+00
2.423540E-01	-7.01147E+00	1.1692E+00	5.0819E+03	1.0770E+00	0.000E+00	5.116E+00
2.439740E-01	-1.03826E+01	1.1643E+00	5.0269E+03	1.0858E+00	0.000E+00	5.082E+00
2.449548E-01	-1.63309E+01	1.1613E+00	4.9939E+03	1.0912E+00	0.000E+00	5.062E+00
2.459970E-01	-1.31494E+01	1.1814E+01	5.0586E+04	1.0969E+00	0.000E+00	5.040E+00
2.460635E-01	-1.29562E+01	1.1809E+01	5.0555E+04	1.0972E+00	0.000E+00	5.039E+00
2.464260E-01	-1.23010E+01	1.1787E+01	5.0384E+04	1.0992E+00	0.000E+00	5.031E+00
2.470527E-01	-1.29419E+01	1.1748E+01	5.0089E+04	1.1026E+00	0.000E+00	5.019E+00
2.485365E-01	-8.06178E+00	1.6906E+01	7.1651E+04	1.1106E+00	0.000E+00	4.989E+00
2.501040E-01	-5.23505E+00	1.6766E+01	7.0615E+04	1.1191E+00	0.000E+00	4.957E+00
2.522460E-01	-2.88933E+00	1.6579E+01	6.9233E+04	1.1306E+00	0.000E+00	4.915E+00
2.629708E-01	2.70864E+00	1.5693E+01	6.2860E+04	1.1875E+00	0.000E+00	4.715E+00
2.811158E-01	6.72406E+00	1.4375E+01	5.3864E+04	1.2809E+00	0.000E+00	4.410E+00
3.005128E-01	8.87011E+00	1.3194E+01	4.6247E+04	1.3765E+00	0.000E+00	4.126E+00
3.136000E-01	9.52780E+00	1.2497E+01	4.1978E+04	1.4385E+00	0.000E+00	3.954E+00
3.184000E-01	9.27500E+00	1.2259E+01	4.0555E+04	1.4607E+00	0.000E+00	3.894E+00
3.196800E-01	8.65940E+00	1.2196E+01	4.0188E+04	1.4666E+00	0.000E+00	3.878E+00
3.212482E-01	9.36235E+00	1.3497E+01	4.4257E+04	1.4738E+00	0.000E+00	3.859E+00
3.216000E-01	9.49472E+00	1.3480E+01	4.4154E+04	1.4754E+00	0.000E+00	3.855E+00
3.264000E-01	1.04119E+01	1.3257E+01	4.2784E+04	1.4972E+00	0.000E+00	3.799E+00
3.434143E-01	1.19186E+01	1.2521E+01	3.8405E+04	1.5722E+00	0.000E+00	3.610E+00
3.671099E-01	1.32280E+01	1.1611E+01	3.3317E+04	1.6712E+00	0.000E+00	3.377E+00
3.924405E-01	1.42235E+01	1.0750E+01	2.8854E+04	1.7700E+00	0.000E+00	3.159E+00
4.195189E-01	1.50147E+01	9.9311E+00	2.4936E+04	1.8681E+00	0.000E+00	2.955E+00
4.484657E-01	1.56524E+01	9.1532E+00	2.1499E+04	1.9646E+00	0.000E+00	2.765E+00
4.794098E-01	1.61677E+01	8.4154E+00	1.8491E+04	2.0590E+00	0.000E+00	2.586E+00
5.124891E-01	1.65820E+01	7.7167E+00	1.5861E+04	2.1505E+00	0.000E+00	2.419E+00
5.478508E-01	1.69113E+01	7.0589E+00	1.3572E+04	2.2385E+00	0.000E+00	2.263E+00
5.856525E-01	1.71691E+01	6.4422E+00	1.1587E+04	2.3221E+00	0.000E+00	2.117E+00
6.260625E-01	1.73665E+01	5.8666E+00	9.8707E+03	2.4009E+00	0.000E+00	1.980E+00
6.692609E-01	1.75131E+01	5.3316E+00	8.3917E+03	2.4741E+00	0.000E+00	1.853E+00
7.154399E-01	1.76172E+01	4.8365E+00	7.1211E+03	2.5412E+00	0.000E+00	1.733E+00
7.648052E-01	1.76890E+01	4.3801E+00	6.0328E+03	2.6018E+00	0.000E+00	1.621E+00
8.175768E-01	1.77293E+01	3.9608E+00	5.1031E+03	2.6552E+00	0.000E+00	1.516E+00
8.739896E-01	1.77465E+01	3.5767E+00	4.3109E+03	2.7012E+00	0.000E+00	1.419E+00
9.342948E-01	1.77457E+01	3.2260E+00	3.6372E+03	2.7394E+00	0.000E+00	1.327E+00
9.987612E-01	1.77336E+01	2.9066E+00	3.0656E+03	2.7695E+00	0.000E+00	1.241E+00
1.067676E+00	1.77035E+01	2.5899E+00	2.5552E+03	2.7914E+00	0.000E+00	1.161E+00
1.141345E+00	1.76519E+01	2.3089E+00	2.1309E+03	2.8050E+00	0.000E+00	1.086E+00
1.220098E+00	1.75882E+01	2.0599E+00	1.7785E+03	2.8102E+00	0.000E+00	1.016E+00
1.304285E+00	1.75176E+01	1.8372E+00	1.4838E+03	2.8072E+00	0.000E+00	9.506E-01
1.394281E+00	1.74390E+01	1.6349E+00	1.2352E+03	2.7960E+00	0.000E+00	8.892E-01
1.490486E+00	1.73539E+01	1.4562E+00	1.0291E+03	2.7769E+00	0.000E+00	8.318E-01
1.593339E+00	1.72641E+01	1.2982E+00	8.5828E+02	2.7501E+00	0.000E+00	7.781E-01
1.703269E+00	1.71699E+01	1.1585E+00	7.1647E+02	2.7159E+00	0.000E+00	7.279E-01
1.820795E+00	1.70705E+01	1.0348E+00	5.9867E+02	2.6749E+00	0.000E+00	6.809E-01
1.946430E+00	1.69641E+01	9.2523E-01	5.0072E+02	2.6273E+00	0.000E+00	6.370E-01
2.080733E+00	1.68476E+01	8.2805E-01	4.1920E+02	2.5737E+00	0.000E+00	5.959E-01
2.224304E+00	1.67157E+01	7.4180E-01	3.5130E+02	2.5146E+00	0.000E+00	5.574E-01
2.377781E+00	1.65595E+01	6.6517E-01	2.9468E+02	2.4505E+00	0.000E+00	5.214E-01
2.541848E+00	1.63623E+01	5.9704E-01	2.4742E+02	2.3820E+00	0.000E+00	4.878E-01
2.717235E+00	1.60891E+01	5.3641E-01	2.0795E+02	2.3098E+00	0.000E+00	4.563E-01
2.904724E+00	1.56440E+01	4.8240E-01	1.7294E+02	2.2347E+00	0.000E+00	4.268E-01
3.105150E+00	1.45379E+01	4.2981E-01	1.4581E+02	2.1561E+00	0.000E+00	3.993E-01
3.138842E+00	1.40901E+01	4.2124E-01	1.4137E+02	2.1432E+00	0.000E+00	3.950E-01
3.186885E+00	1.25541E+01	4.0949E-01	1.3535E+02	2.1250E+00	0.000E+00	3.890E-01
3.199697E+00	1.07060E+01	4.0644E-01	1.3381E+02	2.1202E+00	0.000E+00	3.875E-01
3.218914E+00	1.25778E+01	4.0445E+00	1.3236E+03	2.1130E+00	1.192E+03	3.852E-01
3.266958E+00	1.42753E+01	3.9547E+00	1.2751E+03	2.0951E+00	1.149E+03	3.795E-01
3.319406E+00	1.50333E+01	3.8605E+00	1.2251E+03	2.0758E+00	1.105E+03	3.735E-01
3.548445E+00	1.64395E+01	3.4785E+00	1.0326E+03	1.9940E+00	9.330E+02	3.494E-01
3.793288E+00	1.71011E+01	3.1275E+00	8.6848E+02	1.9112E+00	7.860E+02	3.269E-01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 175

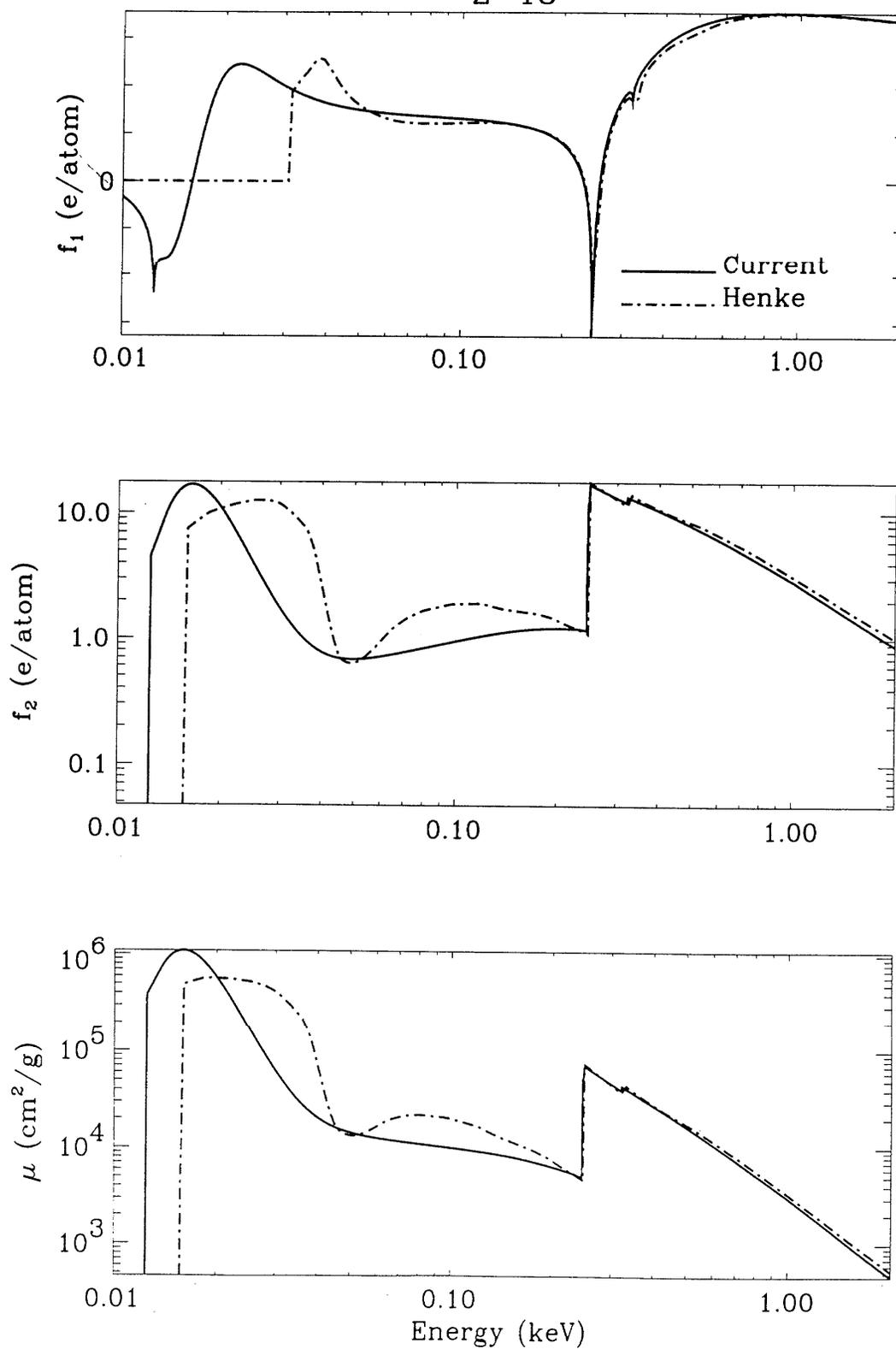
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

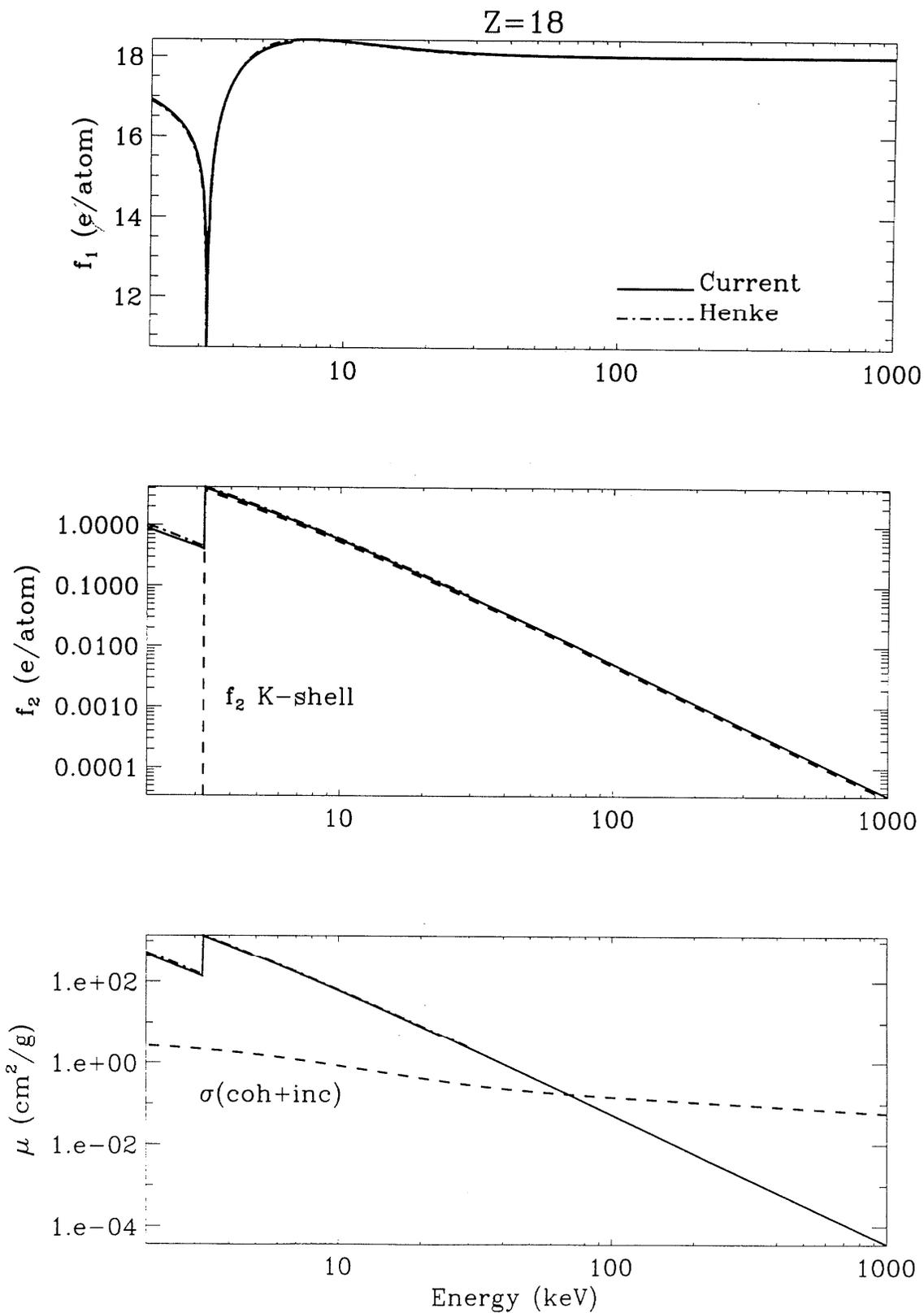
E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.055024E+00	1.75109E+01	2.8093E+00	7.2977E+02	1.8279E+00	6.614E+02	3.058E-01
4.334821E+00	1.77899E+01	2.5178E+00	6.1183E+02	1.7447E+00	5.552E+02	2.860E-01
4.633924E+00	1.79817E+01	2.2529E+00	5.1214E+02	1.6619E+00	4.651E+02	2.676E-01
4.953664E+00	1.81162E+01	2.0148E+00	4.2845E+02	1.5799E+00	3.895E+02	2.503E-01
5.295467E+00	1.82108E+01	1.8015E+00	3.5836E+02	1.4993E+00	3.261E+02	2.341E-01
5.660855E+00	1.82767E+01	1.6105E+00	2.9968E+02	1.4202E+00	2.729E+02	2.190E-01
6.051453E+00	1.83220E+01	1.4394E+00	2.5055E+02	1.3431E+00	2.283E+02	2.049E-01
6.469004E+00	1.83939E+01	1.2843E+00	2.0912E+02	1.2682E+00	1.908E+02	1.917E-01
6.915365E+00	1.84089E+01	1.1397E+00	1.7360E+02	1.1956E+00	1.585E+02	1.793E-01
7.392525E+00	1.84120E+01	1.0114E+00	1.4412E+02	1.1257E+00	1.316E+02	1.677E-01
7.902609E+00	1.84075E+01	8.9769E-01	1.1966E+02	1.0585E+00	1.093E+02	1.569E-01
8.447890E+00	1.83978E+01	7.9678E-01	9.9352E+01	9.9414E-01	9.082E+01	1.468E-01
9.030794E+00	1.83906E+01	7.0619E-01	8.2371E+01	9.3278E-01	7.533E+01	1.373E-01
9.653919E+00	1.83744E+01	6.2255E-01	6.7929E+01	8.7443E-01	6.217E+01	1.284E-01
1.032004E+01	1.83552E+01	5.4885E-01	5.6022E+01	8.1911E-01	5.131E+01	1.201E-01
1.103212E+01	1.83348E+01	4.8390E-01	4.6204E+01	7.6684E-01	4.235E+01	1.124E-01
1.179334E+01	1.83139E+01	4.2666E-01	3.8109E+01	7.1759E-01	3.495E+01	1.051E-01
1.260708E+01	1.82932E+01	3.7619E-01	3.1432E+01	6.7131E-01	2.885E+01	9.834E-02
1.347697E+01	1.82732E+01	3.3171E-01	2.5927E+01	6.2794E-01	2.381E+01	9.200E-02
1.440688E+01	1.82541E+01	2.9142E-01	2.1307E+01	5.8741E-01	1.957E+01	8.606E-02
1.540095E+01	1.82350E+01	2.5528E-01	1.7461E+01	5.4962E-01	1.604E+01	8.050E-02
1.646362E+01	1.82165E+01	2.2364E-01	1.4309E+01	5.1447E-01	1.314E+01	7.531E-02
1.759961E+01	1.81987E+01	1.9592E-01	1.1726E+01	4.8185E-01	1.077E+01	7.045E-02
1.881398E+01	1.81819E+01	1.7165E-01	9.6104E+00	4.5163E-01	8.824E+00	6.590E-02
2.011215E+01	1.81662E+01	1.5039E-01	7.8765E+00	4.2371E-01	7.230E+00	6.165E-02
2.149988E+01	1.81516E+01	1.3176E-01	6.4556E+00	3.9795E-01	5.925E+00	5.767E-02
2.298338E+01	1.81380E+01	1.1545E-01	5.2912E+00	3.7422E-01	4.855E+00	5.395E-02
2.456923E+01	1.81255E+01	1.0116E-01	4.3369E+00	3.5240E-01	3.978E+00	5.046E-02
2.626450E+01	1.81140E+01	8.8636E-02	3.5549E+00	3.3236E-01	3.260E+00	4.721E-02
2.807676E+01	1.81044E+01	7.7197E-02	2.8963E+00	3.1397E-01	2.656E+00	4.416E-02
3.001405E+01	1.80947E+01	6.7103E-02	2.3550E+00	2.9712E-01	2.160E+00	4.131E-02
3.208502E+01	1.80856E+01	5.8330E-02	1.9150E+00	2.8168E-01	1.756E+00	3.864E-02
3.429889E+01	1.80773E+01	5.0704E-02	1.5572E+00	2.6755E-01	1.428E+00	3.615E-02
3.666511E+01	1.80696E+01	4.4077E-02	1.2663E+00	2.5461E-01	1.161E+00	3.381E-02
3.919543E+01	1.80627E+01	3.8316E-02	1.0297E+00	2.4276E-01	9.445E-01	3.163E-02
4.189992E+01	1.80563E+01	3.3309E-02	8.3740E-01	2.3191E-01	7.681E-01	2.959E-02
4.479101E+01	1.80506E+01	2.8957E-02	6.8099E-01	2.2196E-01	6.246E-01	2.768E-02
4.788159E+01	1.80454E+01	2.5173E-02	5.5380E-01	2.1282E-01	5.080E-01	2.589E-02
5.118542E+01	1.80407E+01	2.1885E-02	4.5038E-01	2.0443E-01	4.131E-01	2.422E-02
5.471721E+01	1.80365E+01	1.9026E-02	3.6627E-01	1.9669E-01	3.359E-01	2.266E-02
5.849270E+01	1.80326E+01	1.6541E-02	2.9787E-01	1.8956E-01	2.732E-01	2.120E-02
6.252870E+01	1.80292E+01	1.4380E-02	2.4225E-01	1.8296E-01	2.221E-01	1.983E-02
6.684318E+01	1.80261E+01	1.2502E-02	1.9702E-01	1.7683E-01	1.807E-01	1.855E-02
7.145536E+01	1.80234E+01	1.0833E-02	1.5970E-01	1.7113E-01	1.464E-01	1.735E-02
7.638578E+01	1.80209E+01	9.3726E-03	1.2925E-01	1.6580E-01	1.184E-01	1.623E-02
8.165640E+01	1.80186E+01	8.1074E-03	1.0459E-01	1.6081E-01	9.577E-02	1.518E-02
8.729069E+01	1.80166E+01	7.0102E-03	8.4595E-02	1.5611E-01	7.746E-02	1.420E-02
9.331374E+01	1.80148E+01	6.0615E-03	6.8425E-02	1.5168E-01	6.266E-02	1.329E-02
9.975239E+01	1.80132E+01	5.2412E-03	5.5347E-02	1.4748E-01	5.068E-02	1.243E-02
1.066353E+02	1.80117E+01	4.5320E-03	4.4768E-02	1.4348E-01	4.100E-02	1.163E-02
1.139931E+02	1.80104E+01	3.9187E-03	3.6212E-02	1.3966E-01	3.316E-02	1.088E-02
1.218587E+02	1.80093E+01	3.3885E-03	2.9291E-02	1.3600E-01	2.682E-02	1.017E-02
1.302669E+02	1.80083E+01	2.9300E-03	2.3693E-02	1.3248E-01	2.170E-02	9.518E-03
1.392553E+02	1.80073E+01	2.5336E-03	1.9165E-02	1.2909E-01	1.755E-02	8.903E-03
1.488640E+02	1.80065E+01	2.1909E-03	1.5503E-02	1.2581E-01	1.420E-02	8.329E-03
1.591356E+02	1.80058E+01	1.8945E-03	1.2540E-02	1.2263E-01	1.148E-02	7.791E-03
1.701159E+02	1.80051E+01	1.6382E-03	1.0144E-02	1.1954E-01	9.288E-03	7.288E-03
1.818539E+02	1.80045E+01	1.4166E-03	8.2055E-03	1.1653E-01	7.512E-03	6.818E-03
1.944018E+02	1.80040E+01	1.2250E-03	6.6376E-03	1.1360E-01	6.077E-03	6.378E-03
2.078156E+02	1.80036E+01	1.0593E-03	5.3693E-03	1.1073E-01	4.915E-03	5.966E-03
2.221548E+02	1.80032E+01	9.1600E-04	4.3433E-03	1.0793E-01	3.976E-03	5.581E-03
2.374835E+02	1.80028E+01	7.9211E-04	3.5134E-03	1.0519E-01	3.216E-03	5.221E-03
2.538699E+02	1.80025E+01	6.8497E-04	2.8421E-03	1.0251E-01	2.601E-03	4.884E-03
2.713869E+02	1.80022E+01	5.9233E-04	2.2991E-03	9.9887E-02	2.104E-03	4.569E-03
2.901126E+02	1.80019E+01	5.1222E-04	1.8598E-03	9.7315E-02	1.702E-03	4.274E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
3.101304E+02	1.80017E+01	4.4295E-04	1.5045E-03	9.4794E-02	1.377E-03	3.998E-03
3.315294E+02	1.80015E+01	3.8305E-04	1.2171E-03	9.2325E-02	1.114E-03	3.740E-03
3.544049E+02	1.80013E+01	3.3125E-04	9.8455E-04	8.9906E-02	9.007E-04	3.498E-03
3.788588E+02	1.80012E+01	2.8645E-04	7.9646E-04	8.7537E-02	7.285E-04	3.273E-03
4.050001E+02	1.80010E+01	2.4772E-04	6.4430E-04	8.5218E-02	5.893E-04	3.061E-03
4.329451E+02	1.80009E+01	2.1422E-04	5.2121E-04	8.2948E-02	4.767E-04	2.864E-03

Z=18





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 179

K Z= 19

Atomic weight = 3.909830E+01 g/mol, nominal density ρ (g/cm³) = 8.6000E-01

$\mu_{\text{atoms/atom}} = \mu(\text{cm}^2/\text{g}) \times 6.49243\text{E}+01$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 1.07627\text{E}+06$

- edges. Edge energies (keV):

K 3.60740E+00 L I 3.77100E-00 L II 2.96300E-00 L III 2.93600E-01
M I 3.39000E-02 M II 1.78000E-02 M III 1.78000E-02
Relativistic correction estimate f_{rel} (H82,3/5CL) = -5.2204E-02, -3.1800E-02 e/atom
Nuclear Thomson correction $f_{\text{NT}} = -5.0651\text{E}-03$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.03631E+00	0.0000E+00	0.0000E+00	1.2556E-04	0.000E+00	1.160E+02
1.142761E-02	6.67451E-01	0.0000E+00	0.0000E+00	1.7071E-04	0.000E+00	1.085E+02
1.221612E-02	1.82018E-01	0.0000E+00	0.0000E+00	2.3082E-04	0.000E+00	1.015E+02
1.305903E-02	-4.81008E-01	0.0000E+00	0.0000E+00	3.1040E-04	0.000E+00	9.494E+01
1.396010E-02	-1.43652E+00	0.0000E+00	0.0000E+00	4.1514E-04	0.000E+00	8.881E+01
1.492335E-02	-2.93411E+00	0.0000E+00	0.0000E+00	5.5224E-04	0.000E+00	8.308E+01
1.595306E-02	-5.66247E+00	0.0000E+00	0.0000E+00	7.3068E-04	0.000E+00	7.772E+01
1.705382E-02	-1.28490E+01	0.0000E+00	0.0000E+00	9.6163E-04	0.000E+00	7.270E+01
1.744400E-02	-2.01638E+01	0.0000E+00	0.0000E+00	1.0542E-03	0.000E+00	7.108E+01
1.771100E-02	-3.64057E+01	0.0000E+00	0.0000E+00	1.1209E-03	0.000E+00	7.000E+01
1.778220E-02	-5.75750E+01	0.0000E+00	0.0000E+00	1.1392E-03	0.000E+00	6.972E+01
1.788900E-02	-3.27660E+01	4.2470E+01	2.5551E+06	1.1670E-03	0.000E+00	6.931E+01
1.815600E-02	-1.09873E+01	3.8222E+01	2.2658E+06	1.2384E-03	0.000E+00	6.829E+01
1.823053E-02	-7.96761E+00	3.7125E+01	2.1917E+06	1.2589E-03	0.000E+00	6.801E+01
1.948844E-02	1.05085E+01	2.3098E+01	1.2756E+06	1.6394E-03	0.000E+00	6.362E+01
2.083314E-02	1.36677E+01	1.4677E+01	7.5824E+05	2.1237E-03	0.000E+00	5.951E+01
2.227063E-02	1.37200E+01	9.7862E+00	4.7294E+05	2.7369E-03	0.000E+00	5.567E+01
2.380730E-02	1.30032E+01	6.8296E+00	3.0875E+05	3.5089E-03	0.000E+00	5.208E+01
2.545001E-02	1.21580E+01	4.9747E+00	2.1038E+05	4.4757E-03	0.000E+00	4.872E+01
2.720606E-02	1.13733E+01	3.7714E+00	1.4920E+05	5.6799E-03	0.000E+00	4.557E+01
2.908327E-02	1.06944E+01	2.9673E+00	1.0981E+05	7.1717E-03	0.000E+00	4.263E+01
3.109002E-02	1.01175E+01	2.4161E+00	8.3640E+04	9.0099E-03	0.000E+00	3.988E+01
3.323523E-02	9.61001E+00	2.0302E+00	6.5743E+04	1.1263E-02	0.000E+00	3.731E+01
3.373050E-02	9.48312E+00	1.9611E+00	6.2575E+04	1.1826E-02	0.000E+00	3.676E+01
3.386610E-02	9.42106E+00	1.9433E+00	6.1757E+04	1.1983E-02	0.000E+00	3.661E+01
3.406950E-02	9.41824E+00	1.9890E+00	6.2832E+04	1.2221E-02	0.000E+00	3.639E+01
3.457800E-02	9.35849E+00	1.9326E+00	6.0155E+04	1.2828E-02	0.000E+00	3.586E+01
3.552846E-02	9.22330E+00	1.8414E+00	5.5782E+04	1.4010E-02	0.000E+00	3.490E+01
3.797993E-02	8.91334E+00	1.6722E+00	4.7388E+04	1.7341E-02	0.000E+00	3.264E+01
4.060054E-02	8.65576E+00	1.5627E+00	4.1425E+04	2.1359E-02	0.000E+00	3.054E+01
4.340198E-02	8.44571E+00	1.4956E+00	3.7087E+04	2.6181E-02	0.000E+00	2.857E+01
4.639671E-02	8.27664E+00	1.4595E+00	3.3856E+04	3.1938E-02	0.000E+00	2.672E+01
4.959809E-02	8.14269E+00	1.4460E+00	3.1378E+04	3.8774E-02	0.000E+00	2.500E+01
5.302035E-02	8.03876E+00	1.4489E+00	2.9412E+04	4.6850E-02	0.000E+00	2.338E+01
5.667876E-02	7.96076E+00	1.4635E+00	2.7790E+04	5.6343E-02	0.000E+00	2.187E+01
6.058959E-02	7.90418E+00	1.4861E+00	2.6399E+04	6.7442E-02	0.000E+00	2.046E+01
6.477028E-02	7.86604E+00	1.5142E+00	2.5161E+04	8.0353E-02	0.000E+00	1.914E+01
6.923942E-02	7.84348E+00	1.5456E+00	2.4026E+04	9.5295E-02	0.000E+00	1.791E+01
7.401695E-02	7.83414E+00	1.5786E+00	2.2955E+04	1.1250E-01	0.000E+00	1.675E+01
7.912411E-02	7.83561E+00	1.6112E+00	2.1916E+04	1.3221E-01	0.000E+00	1.567E+01
8.458368E-02	7.84534E+00	1.6420E+00	2.0893E+04	1.5467E-01	0.000E+00	1.466E+01
9.041995E-02	7.86087E+00	1.6700E+00	1.9878E+04	1.8014E-01	0.000E+00	1.371E+01
9.665893E-02	7.87971E+00	1.6941E+00	1.8864E+04	2.0888E-01	0.000E+00	1.283E+01
1.033284E-01	7.89855E+00	1.7137E+00	1.7850E+04	2.4113E-01	0.000E+00	1.200E+01
1.104581E-01	7.91598E+00	1.7279E+00	1.6836E+04	2.7715E-01	0.000E+00	1.122E+01
1.180797E-01	7.92812E+00	1.7363E+00	1.5826E+04	3.1718E-01	0.000E+00	1.050E+01
1.262272E-01	7.93138E+00	1.7384E+00	1.4823E+04	3.6142E-01	0.000E+00	9.822E+00
1.349368E-01	7.92155E+00	1.7340E+00	1.3831E+04	4.1009E-01	0.000E+00	9.188E+00
1.442475E-01	7.89362E+00	1.7229E+00	1.2855E+04	4.6334E-01	0.000E+00	8.595E+00
1.542005E-01	7.84127E+00	1.7050E+00	1.1900E+04	5.2131E-01	0.000E+00	8.040E+00
1.648404E-01	7.75650E+00	1.6805E+00	1.0972E+04	5.8410E-01	0.000E+00	7.521E+00
1.762144E-01	7.62874E+00	1.6500E+00	1.0078E+04	6.5175E-01	0.000E+00	7.036E+00
1.883732E-01	7.44332E+00	1.6139E+00	9.2212E+03	7.2427E-01	0.000E+00	6.582E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.013709E-01	7.17851E+00	1.5729E+00	8.4066E+03	8.0159E-01	0.000E+00	6.157E+00
2.152655E-01	6.79980E+00	1.5275E+00	7.6373E+03	8.8361E-01	0.000E+00	5.760E+00
2.301188E-01	6.24684E+00	1.4787E+00	6.9158E+03	9.7013E-01	0.000E+00	5.388E+00
2.459970E-01	5.39894E+00	1.4270E+00	6.2432E+03	1.0609E+00	0.000E+00	5.040E+00
2.629708E-01	3.95518E+00	1.3732E+00	5.6202E+03	1.1557E+00	0.000E+00	4.715E+00
2.811158E-01	7.05984E-01	1.3181E+00	5.0463E+03	1.2540E+00	0.000E+00	4.410E+00
2.877280E-01	-2.13949E+00	1.2987E+00	4.8577E+03	1.2890E+00	0.000E+00	4.309E+00
2.903740E-01	-4.36755E+00	1.2910E+00	4.7850E+03	1.3029E+00	0.000E+00	4.270E+00
2.921320E-01	-7.17401E+00	1.2859E+00	4.7376E+03	1.3121E+00	0.000E+00	4.244E+00
2.933064E-01	-1.24621E+01	1.2826E+00	4.7063E+03	1.3182E+00	0.000E+00	4.227E+00
2.948185E-01	-9.07883E+00	1.0759E+01	3.9275E+04	1.3261E+00	0.000E+00	4.205E+00
2.950680E-01	-8.77535E+00	1.0750E+01	3.9210E+04	1.3274E+00	0.000E+00	4.202E+00
2.960037E-01	-9.35450E+00	1.0716E+01	3.8965E+04	1.3322E+00	0.000E+00	4.189E+00
2.977815E-01	-5.13667E+00	1.5353E+01	5.5490E+04	1.3414E+00	0.000E+00	4.164E+00
2.994720E-01	-2.87198E+00	1.5268E+01	5.4870E+04	1.3501E+00	0.000E+00	4.140E+00
3.005178E-01	-1.90035E+00	1.5216E+01	5.4494E+04	1.3555E+00	0.000E+00	4.126E+00
3.022260E-01	-6.40194E-01	1.5131E+01	5.3882E+04	1.3642E+00	0.000E+00	4.102E+00
3.212482E-01	5.59255E+00	1.4247E+01	4.7733E+04	1.4596E+00	0.000E+00	3.859E+00
3.434143E-01	8.59570E+00	1.3306E+01	4.1700E+04	1.5657E+00	0.000E+00	3.610E+00
3.671099E-01	1.01429E+01	1.2353E+01	3.6216E+04	1.6733E+00	0.000E+00	3.377E+00
3.695580E-01	1.01830E+01	1.2259E+01	3.5702E+04	1.6841E+00	0.000E+00	3.355E+00
3.752145E-01	9.89081E+00	1.2044E+01	3.4548E+04	1.7087E+00	0.000E+00	3.304E+00
3.767229E-01	9.19868E+00	1.1988E+01	3.4248E+04	1.7152E+00	0.000E+00	3.291E+00
3.789855E-01	1.01360E+01	1.3446E+01	3.8186E+04	1.7250E+00	0.000E+00	3.271E+00
3.846420E-01	1.11597E+01	1.3233E+01	3.7028E+04	1.7490E+00	0.000E+00	3.233E+00
3.924405E-01	1.19388E+01	1.2947E+01	3.5506E+04	1.7817E+00	0.000E+00	3.159E+00
4.195189E-01	1.36474E+01	1.2012E+01	3.0817E+04	1.8901E+00	0.000E+00	2.955E+00
4.484657E-01	1.48494E+01	1.1110E+01	2.6662E+04	1.9978E+00	0.000E+00	2.765E+00
4.794098E-01	1.57726E+01	1.0243E+01	2.2996E+04	2.1041E+00	0.000E+00	2.586E+00
5.124891E-01	1.64983E+01	9.4182E+00	1.9779E+04	2.2081E+00	0.000E+00	2.419E+00
5.478508E-01	1.70723E+01	8.6374E+00	1.6968E+04	2.3091E+00	0.000E+00	2.263E+00
5.856525E-01	1.75257E+01	7.9026E+00	1.4523E+04	2.4062E+00	0.000E+00	2.117E+00
6.260625E-01	1.78814E+01	7.2147E+00	1.2403E+04	2.4988E+00	0.000E+00	1.980E+00
6.692609E-01	1.81571E+01	6.5728E+00	1.0570E+04	2.5861E+00	0.000E+00	1.853E+00
7.154399E-01	1.83667E+01	5.9766E+00	8.9909E+03	2.6673E+00	0.000E+00	1.733E+00
7.648052E-01	1.85218E+01	5.4252E+00	7.6347E+03	2.7419E+00	0.000E+00	1.621E+00
8.175768E-01	1.86322E+01	4.9170E+00	6.4728E+03	2.8092E+00	0.000E+00	1.516E+00
8.739896E-01	1.87063E+01	4.4499E+00	5.4798E+03	2.8688E+00	0.000E+00	1.419E+00
9.342948E-01	1.87539E+01	4.0218E+00	4.6329E+03	2.9201E+00	0.000E+00	1.327E+00
9.987612E-01	1.87769E+01	3.6304E+00	3.9121E+03	2.9628E+00	0.000E+00	1.241E+00
1.067676E+00	1.87770E+01	3.2670E+00	3.2933E+03	2.9966E+00	0.000E+00	1.161E+00
1.141345E+00	1.87592E+01	2.9368E+00	2.7694E+03	3.0213E+00	0.000E+00	1.086E+00
1.220098E+00	1.87275E+01	2.6275E+00	2.3178E+03	3.0368E+00	0.000E+00	1.016E+00
1.304285E+00	1.86758E+01	2.3429E+00	1.9333E+03	3.0431E+00	0.000E+00	9.506E-01
1.394281E+00	1.86114E+01	2.0908E+00	1.6139E+03	3.0402E+00	0.000E+00	8.892E-01
1.490486E+00	1.85398E+01	1.8674E+00	1.3485E+03	3.0282E+00	0.000E+00	8.318E-01
1.593329E+00	1.84623E+01	1.6641E+00	1.1241E+03	3.0075E+00	0.000E+00	7.781E-01
1.703269E+00	1.83778E+01	1.4833E+00	9.3726E+02	2.9783E+00	0.000E+00	7.279E-01
1.820795E+00	1.82883E+01	1.3233E+00	7.8221E+02	2.9409E+00	0.000E+00	6.809E-01
1.946430E+00	1.81940E+01	1.1817E+00	6.5343E+02	2.8958E+00	0.000E+00	6.370E-01
2.080733E+00	1.80940E+01	1.0563E+00	5.4636E+02	2.8436E+00	0.000E+00	5.959E-01
2.224304E+00	1.79866E+01	9.4505E-01	4.5728E+02	2.7847E+00	0.000E+00	5.574E-01
2.377781E+00	1.78682E+01	8.4636E-01	3.8309E+02	2.7198E+00	0.000E+00	5.214E-01
2.541848E+00	1.77332E+01	7.5870E-01	3.2125E+02	2.6493E+00	0.000E+00	4.878E-01
2.717235E+00	1.75716E+01	6.8077E-01	2.6965E+02	2.5741E+00	0.000E+00	4.563E-01
2.904724E+00	1.73645E+01	6.1143E-01	2.2655E+02	2.4946E+00	0.000E+00	4.268E-01
3.105150E+00	1.70762E+01	5.4407E-01	1.8858E+02	2.4116E+00	0.000E+00	3.993E-01
3.319406E+00	1.65660E+01	4.7995E-01	1.5562E+02	2.3258E+00	0.000E+00	3.735E-01
3.535252E+00	1.51657E+01	4.2673E-01	1.2991E+02	2.2426E+00	0.000E+00	3.507E-01
3.748445E+00	1.49494E+01	4.2379E-01	1.2854E+02	2.2376E+00	0.000E+00	3.494E-01
3.989363E+00	1.36420E+01	4.1486E-01	1.2440E+02	2.2223E+00	0.000E+00	3.454E-01
4.260379E+00	1.18067E+01	4.1178E-01	1.2298E+02	2.2169E+00	0.000E+00	3.440E-01
4.5625437E+00	1.36705E+01	4.0255E+00	1.1950E+03	2.2089E+00	1.074E+03	3.420E-01
4.879548E+00	1.53599E+01	3.9276E+00	1.1488E+03	2.1890E+00	1.033E+03	3.370E-01
5.2193288E+00	1.65531E+01	3.7542E+00	1.0595E+03	2.1479E+00	9.532E+02	3.269E-01

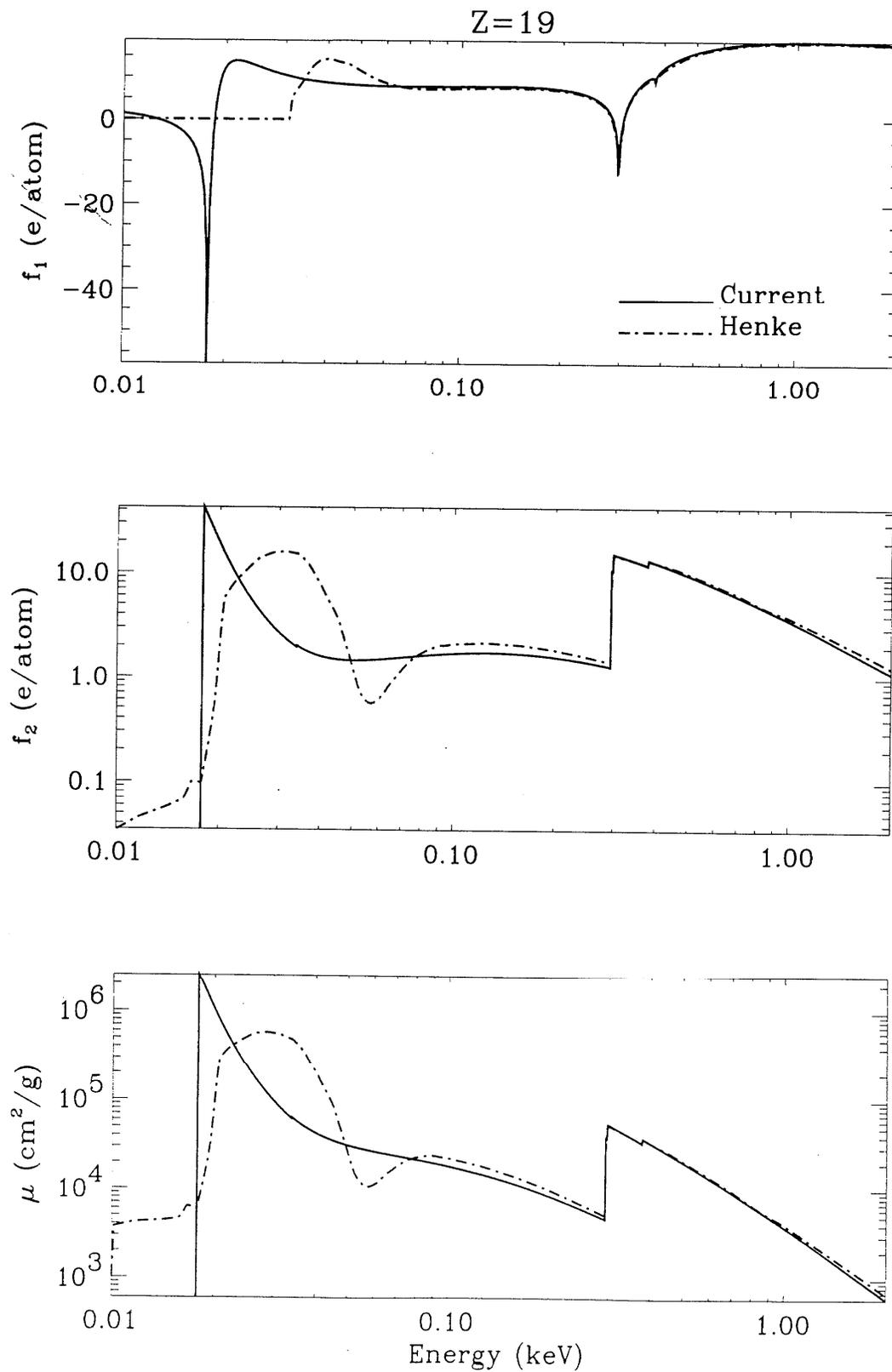
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 181

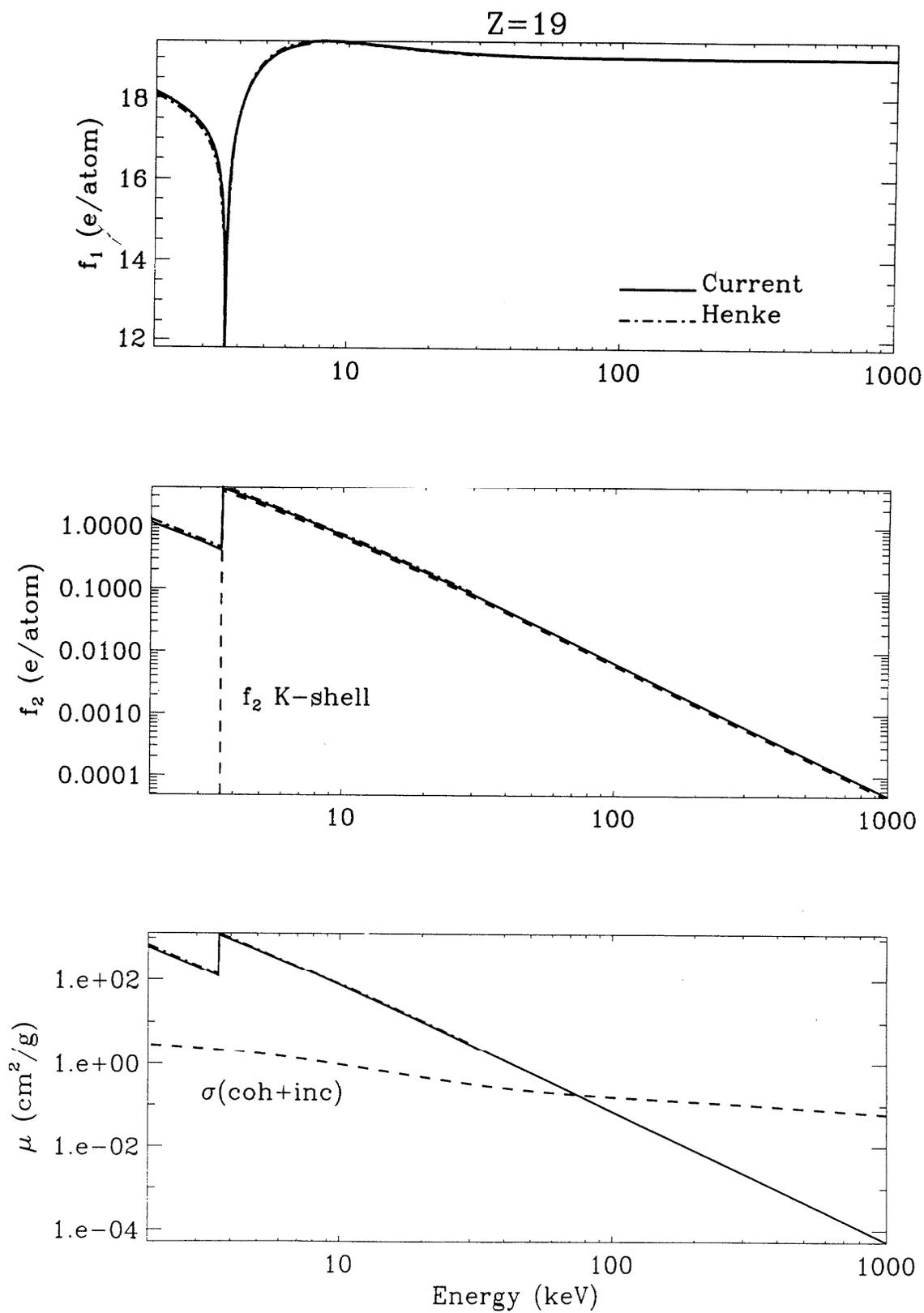
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.055024E+00	1.76584E+01	3.3541E+00	8.9025E+02	2.0571E+00	8.023E+02	3.058E-01
4.334821E+00	1.82298E+01	3.0167E+00	7.4900E+02	1.9659E+00	6.762E+02	2.860E-01
4.633924E+00	1.85966E+01	2.7144E+00	6.3045E+02	1.8747E+00	5.701E+02	2.676E-01
4.953664E+00	1.88512E+01	2.4328E+00	5.2856E+02	1.7841E+00	4.785E+02	2.503E-01
5.295467E+00	1.90266E+01	2.1770E+00	4.4246E+02	1.6946E+00	4.009E+02	2.341E-01
5.660855E+00	1.91497E+01	1.9467E+00	3.7012E+02	1.6065E+00	3.356E+02	2.190E-01
6.051453E+00	1.92357E+01	1.7396E+00	3.0940E+02	1.5202E+00	2.808E+02	2.049E-01
6.469004E+00	1.92949E+01	1.5542E+00	2.5857E+02	1.4361E+00	2.348E+02	1.917E-01
6.915365E+00	1.93348E+01	1.3883E+00	2.1607E+02	1.3545E+00	1.963E+02	1.793E-01
7.392525E+00	1.94018E+01	1.2373E+00	1.8013E+02	1.2756E+00	1.638E+02	1.677E-01
7.902609E+00	1.94134E+01	1.0989E+00	1.4966E+02	1.1996E+00	1.362E+02	1.569E-01
8.447890E+00	1.94155E+01	9.7605E-01	1.2435E+02	1.1266E+00	1.132E+02	1.468E-01
9.030794E+00	1.94122E+01	8.6567E-01	1.0317E+02	1.0569E+00	9.396E+01	1.373E-01
9.653919E+00	1.94018E+01	7.6367E-01	8.5137E+01	9.9047E-01	7.761E+01	1.284E-01
1.032004E+01	1.93862E+01	6.7372E-01	7.0262E+01	9.2736E-01	6.410E+01	1.201E-01
1.103212E+01	1.93677E+01	5.9441E-01	5.7990E+01	8.6762E-01	5.295E+01	1.124E-01
1.179334E+01	1.93476E+01	5.2447E-01	4.7864E+01	8.1125E-01	4.373E+01	1.051E-01
1.260708E+01	1.93268E+01	4.6278E-01	3.9508E+01	7.5820E-01	3.612E+01	9.834E-02
1.347697E+01	1.93059E+01	4.0837E-01	3.2613E+01	7.0842E-01	2.984E+01	9.200E-02
1.440688E+01	1.92855E+01	3.6038E-01	2.6922E+01	6.6185E-01	2.464E+01	8.606E-02
1.540095E+01	1.92659E+01	3.1804E-01	2.2226E+01	6.1839E-01	2.036E+01	8.050E-02
1.646362E+01	1.92470E+01	2.7920E-01	1.8252E+01	5.7794E-01	1.672E+01	7.531E-02
1.759961E+01	1.92283E+01	2.4474E-01	1.4967E+01	5.4037E-01	1.371E+01	7.045E-02
1.881398E+01	1.92102E+01	2.1455E-01	1.2273E+01	5.0557E-01	1.124E+01	6.590E-02
2.011215E+01	1.91929E+01	1.8808E-01	1.0065E+01	4.7340E-01	9.213E+00	6.165E-02
2.149988E+01	1.91767E+01	1.6489E-01	8.2542E+00	4.4372E-01	7.554E+00	5.767E-02
2.298338E+01	1.91616E+01	1.4456E-01	6.7694E+00	4.1640E-01	6.193E+00	5.395E-02
2.456923E+01	1.91476E+01	1.2674E-01	5.5520E+00	3.9128E-01	5.078E+00	5.046E-02
2.626450E+01	1.91350E+01	1.1112E-01	4.5536E+00	3.6823E-01	4.163E+00	4.721E-02
2.807676E+01	1.91233E+01	9.6820E-02	3.7114E+00	3.4711E-01	3.393E+00	4.416E-02
3.001405E+01	1.91119E+01	8.4188E-02	3.0189E+00	3.2778E-01	2.760E+00	4.131E-02
3.208502E+01	1.91014E+01	7.3206E-02	2.4556E+00	3.1011E-01	2.245E+00	3.864E-02
3.429889E+01	1.90917E+01	6.3658E-02	1.9975E+00	2.9396E-01	1.827E+00	3.615E-02
3.666551E+01	1.90827E+01	5.5356E-02	1.6249E+00	2.7922E-01	1.486E+00	3.381E-02
3.919543E+01	1.90746E+01	4.8138E-02	1.3218E+00	2.6576E-01	1.209E+00	3.163E-02
4.189992E+01	1.90671E+01	4.1862E-02	1.0753E+00	2.5347E-01	9.833E-01	2.959E-02
4.479101E+01	1.90603E+01	3.6404E-02	8.7475E-01	2.4224E-01	7.999E-01	2.768E-02
4.788159E+01	1.90542E+01	3.1659E-02	7.1163E-01	2.3198E-01	6.507E-01	2.589E-02
5.118542E+01	1.90486E+01	2.7533E-02	5.7893E-01	2.2259E-01	5.293E-01	2.422E-02
5.471721E+01	1.90436E+01	2.3945E-02	4.7099E-01	2.1398E-01	4.306E-01	2.266E-02
5.849270E+01	1.90391E+01	2.0825E-02	3.8317E-01	2.0607E-01	3.503E-01	2.120E-02
6.252870E+01	1.90350E+01	1.8111E-02	3.1174E-01	1.9880E-01	2.849E-01	1.983E-02
6.684318E+01	1.90313E+01	1.5752E-02	2.5362E-01	1.9208E-01	2.318E-01	1.855E-02
7.145536E+01	1.90280E+01	1.3700E-02	2.0635E-01	1.8586E-01	1.885E-01	1.735E-02
7.638578E+01	1.90251E+01	1.1915E-02	1.6788E-01	1.8009E-01	1.534E-01	1.623E-02
8.165640E+01	1.90224E+01	1.0336E-02	1.3624E-01	1.7470E-01	1.244E-01	1.518E-02
8.729069E+01	1.90200E+01	8.9613E-03	1.1049E-01	1.6965E-01	1.009E-01	1.420E-02
9.331374E+01	1.90178E+01	7.7691E-03	8.9608E-02	1.6491E-01	8.186E-02	1.329E-02
9.975239E+01	1.90159E+01	6.7356E-03	7.2673E-02	1.6043E-01	6.640E-02	1.243E-02
1.066353E+02	1.90142E+01	5.8397E-03	5.8940E-02	1.5618E-01	5.385E-02	1.163E-02
1.139931E+02	1.90126E+01	5.0629E-03	4.7802E-02	1.5213E-01	4.368E-02	1.088E-02
1.218587E+02	1.90112E+01	4.3895E-03	3.8769E-02	1.4825E-01	3.543E-02	1.017E-02
1.302669E+02	1.90100E+01	3.8057E-03	3.1443E-02	1.4453E-01	2.873E-02	9.518E-03
1.392553E+02	1.90089E+01	3.2996E-03	2.5502E-02	1.4095E-01	2.331E-02	8.903E-03
1.488640E+02	1.90079E+01	2.8608E-03	2.0683E-02	1.3747E-01	1.890E-02	8.329E-03
1.591356E+02	1.90070E+01	2.4804E-03	1.6775E-02	1.3410E-01	1.533E-02	7.791E-03
1.701159E+02	1.90062E+01	2.1505E-03	1.3606E-02	1.3082E-01	1.244E-02	7.288E-03
1.818539E+02	1.90055E+01	1.8646E-03	1.1035E-02	1.2762E-01	1.009E-02	6.818E-03
1.944018E+02	1.90049E+01	1.6166E-03	8.9503E-03	1.2448E-01	8.181E-03	6.378E-03
2.078156E+02	1.90044E+01	1.4017E-03	7.2593E-03	1.2141E-01	6.635E-03	5.966E-03
2.221548E+02	1.90039E+01	1.2153E-03	5.8879E-03	1.1839E-01	5.382E-03	5.581E-03
2.374835E+02	1.90034E+01	1.0537E-03	4.7756E-03	1.1543E-01	4.365E-03	5.221E-03
2.538699E+02	1.90030E+01	9.1366E-04	3.8734E-03	1.1251E-01	3.540E-03	4.884E-03
2.713869E+02	1.90027E+01	7.9219E-04	3.1417E-03	1.0964E-01	2.872E-03	4.569E-03
2.901126E+02	1.90024E+01	6.8688E-04	2.5482E-03	1.0681E-01	2.329E-03	4.274E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
3.101304E+02	1.90021E+01	5.9557E-04	2.0668E-03	1.0402E-01	1.889E-03	3.998E-03
3.315294E+02	1.90019E+01	5.1640E-04	1.6764E-03	1.0127E-01	1.532E-03	3.740E-03
3.544049E+02	1.90017E+01	4.4775E-04	1.3597E-03	9.8556E-02	1.243E-03	3.498E-03
3.788588E+02	1.90015E+01	3.8823E-04	1.1029E-03	9.5886E-02	1.008E-03	3.273E-03
4.050001E+02	1.90013E+01	3.3663E-04	8.9458E-04	9.3255E-02	8.176E-04	3.061E-03
4.329451E+02	1.90011E+01	2.9188E-04	7.2560E-04	9.0665E-02	6.631E-04	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 185

Ca Z = 20

Atomic weight = 4.008000E+01 g/mol, nominal density ρ (g/cm³) = 1.5500E+00

μ_0 (barns/atom) = μ (cm²/g) \times 6.65545E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.04991E+06

Edges. Edge energies (keV):

K 4.03810E+00 L I 4.37800E-00 L II 3.50000E-00 L III 3.46400E-01
 M I 4.37000E-02 M II 2.54000E-02 M III 2.54000E-02
 Relativistic correction estimate f_{rel} (H82,3/5CL) = -5.8720E-02, -3.6000E-02 e/atom
 Nuclear Thomson correction f_{NT} = -5.4748E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	6.74674E+00	0.0000E+00	0.0000E+00	1.1540E-04	0.000E+00	1.160E+02
1.142761E-02	6.71135E+00	0.0000E+00	0.0000E+00	1.5728E-04	0.000E+00	1.085E+02
1.221612E-02	6.66883E+00	0.0000E+00	0.0000E+00	2.1319E-04	0.000E+00	1.015E+02
1.305903E-02	6.61724E+00	0.0000E+00	0.0000E+00	2.8739E-04	0.000E+00	9.494E+01
1.396010E-02	6.55391E+00	0.0000E+00	0.0000E+00	3.8531E-04	0.000E+00	8.881E+01
1.492335E-02	6.47500E+00	0.0000E+00	0.0000E+00	5.1380E-04	0.000E+00	8.308E+01
1.595306E-02	6.37476E+00	0.0000E+00	0.0000E+00	6.8145E-04	0.000E+00	7.772E+01
1.705382E-02	6.24417E+00	0.0000E+00	0.0000E+00	8.9899E-04	0.000E+00	7.270E+01
1.823053E-02	6.06801E+00	0.0000E+00	0.0000E+00	1.1797E-03	0.000E+00	6.801E+01
1.948844E-02	5.81829E+00	0.0000E+00	0.0000E+00	1.5399E-03	0.000E+00	6.362E+01
2.083314E-02	5.43633E+00	0.0000E+00	0.0000E+00	1.9995E-03	0.000E+00	5.951E+01
2.227063E-02	4.77106E+00	0.0000E+00	0.0000E+00	2.5828E-03	0.000E+00	5.567E+01
2.380730E-02	3.24162E+00	0.0000E+00	0.0000E+00	3.3190E-03	0.000E+00	5.208E+01
2.489200E-02	-3.74657E-01	0.0000E+00	0.0000E+00	3.9129E-03	0.000E+00	4.981E+01
2.527300E-02	-6.20519E+00	0.0000E+00	0.0000E+00	4.1366E-03	0.000E+00	4.906E+01
2.537460E-02	-1.41462E+01	0.0000E+00	0.0000E+00	4.1976E-03	0.000E+00	4.886E+01
2.545001E-02	-9.70039E+00	1.6608E+01	6.8516E+05	4.2432E-03	0.000E+00	4.872E+01
2.552700E-02	-4.18744E+00	1.6030E+01	6.5929E+05	4.2902E-03	0.000E+00	4.857E+01
2.590800E-02	4.30351E+00	1.3471E+01	5.4589E+05	4.5273E-03	0.000E+00	4.786E+01
2.720606E-02	1.02441E+01	7.5878E+00	2.9282E+05	5.3971E-03	0.000E+00	4.557E+01
2.908327E-02	1.06666E+01	3.5839E+00	1.2938E+05	6.8300E-03	0.000E+00	4.263E+01
3.109002E-02	9.98904E+00	1.9921E+00	6.7275E+04	8.5998E-03	0.000E+00	3.988E+01
3.323523E-02	9.39459E+00	1.2880E+00	4.0688E+04	1.0774E-02	0.000E+00	3.731E+01
3.552846E-02	8.94477E+00	9.4430E-01	2.7905E+04	1.3431E-02	0.000E+00	3.490E+01
3.797993E-02	8.59656E+00	7.6777E-01	2.1224E+04	1.6661E-02	0.000E+00	3.264E+01
4.060054E-02	8.30210E+00	6.7898E-01	1.7558E+04	2.0566E-02	0.000E+00	3.054E+01
4.282600E-02	8.04432E+00	6.4639E-01	1.5847E+04	2.4253E-02	0.000E+00	2.895E+01
4.340198E-02	7.92888E+00	6.4220E-01	1.5535E+04	2.5263E-02	0.000E+00	2.857E+01
4.348150E-02	7.90165E+00	6.4174E-01	1.5495E+04	2.5405E-02	0.000E+00	2.851E+01
4.365630E-02	7.77713E+00	6.4081E-01	1.5411E+04	2.5717E-02	0.000E+00	2.840E+01
4.391850E-02	7.86952E+00	8.5980E-01	2.0554E+04	2.6189E-02	0.000E+00	2.823E+01
4.457400E-02	7.92308E+00	8.6461E-01	2.0365E+04	2.7389E-02	0.000E+00	2.782E+01
4.639671E-02	7.90007E+00	8.8583E-01	2.0045E+04	3.0884E-02	0.000E+00	2.672E+01
4.959809E-02	7.81742E+00	9.4439E-01	1.9991E+04	3.7573E-02	0.000E+00	2.500E+01
5.302035E-02	7.74364E+00	1.0243E+00	2.0284E+04	4.5494E-02	0.000E+00	2.338E+01
5.667876E-02	7.68645E+00	1.1216E+00	2.0776E+04	5.4825E-02	0.000E+00	2.187E+01
6.058959E-02	7.64749E+00	1.2338E+00	2.1379E+04	6.5760E-02	0.000E+00	2.046E+01
6.477028E-02	7.62780E+00	1.3587E+00	2.2024E+04	7.8508E-02	0.000E+00	1.914E+01
6.923942E-02	7.62852E+00	1.4940E+00	2.2654E+04	9.3295E-02	0.000E+00	1.791E+01
7.401695E-02	7.65082E+00	1.6367E+00	2.3216E+04	1.1036E-01	0.000E+00	1.675E+01
7.912411E-02	7.70078E+00	1.7833E+00	2.3663E+04	1.2995E-01	0.000E+00	1.567E+01
8.458368E-02	7.76858E+00	1.9298E+00	2.3954E+04	1.5232E-01	0.000E+00	1.466E+01
9.041995E-02	7.85896E+00	2.0717E+00	2.4055E+04	1.7775E-01	0.000E+00	1.371E+01
9.665893E-02	7.97064E+00	2.2042E+00	2.3942E+04	2.0650E-01	0.000E+00	1.283E+01
1.033284E-01	8.10171E+00	2.3229E+00	2.3603E+04	2.3884E-01	0.000E+00	1.200E+01
1.104581E-01	8.24823E+00	2.4206E+00	2.3008E+04	2.7504E-01	0.000E+00	1.122E+01
1.180797E-01	8.40291E+00	2.4932E+00	2.2168E+04	3.1534E-01	0.000E+00	1.050E+01
1.262272E-01	8.55822E+00	2.5393E+00	2.1121E+04	3.5999E-01	0.000E+00	9.822E+00
1.349368E-01	8.70566E+00	2.5589E+00	1.9910E+04	4.0920E-01	0.000E+00	9.188E+00
1.442475E-01	8.84003E+00	2.5530E+00	1.8582E+04	4.6317E-01	0.000E+00	8.595E+00
1.542005E-01	8.95323E+00	2.5241E+00	1.7186E+04	5.2206E-01	0.000E+00	8.040E+00
1.648404E-01	9.03840E+00	2.4748E+00	1.5763E+04	5.8597E-01	0.000E+00	7.521E+00
1.762144E-01	9.08864E+00	2.4086E+00	1.4351E+04	6.5498E-01	0.000E+00	7.036E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.883732E-01	9.09648E+00	2.3287E+00	1.2979E+04	7.2911E-01	0.000E+00	6.582E+00
2.013709E-01	9.05296E+00	2.2384E+00	1.1670E+04	8.0833E-01	0.000E+00	6.157E+00
2.152655E-01	8.94650E+00	2.1408E+00	1.0441E+04	8.9254E-01	0.000E+00	5.760E+00
2.301188E-01	8.76054E+00	2.0387E+00	9.3014E+03	9.8158E-01	0.000E+00	5.388E+00
2.459970E-01	8.46935E+00	1.9345E+00	8.2563E+03	1.0752E+00	0.000E+00	5.040E+00
2.629708E-01	8.02921E+00	1.8301E+00	7.3067E+03	1.1732E+00	0.000E+00	4.715E+00
2.811158E-01	7.35724E+00	1.7271E+00	6.4504E+03	1.2750E+00	0.000E+00	4.410E+00
3.005128E-01	6.26827E+00	1.6267E+00	5.6831E+03	1.3804E+00	0.000E+00	4.126E+00
3.212482E-01	4.20000E+00	1.5296E+00	4.9991E+03	1.4888E+00	0.000E+00	3.859E+00
3.394720E-01	-6.01802E-01	1.4524E+00	4.4918E+03	1.5802E+00	0.000E+00	3.652E+00
3.430000E-01	-3.23076E+00	1.4382E+00	4.4023E+03	1.5975E+00	0.000E+00	3.615E+00
3.434143E-01	-3.69940E+00	1.4366E+00	4.3919E+03	1.5995E+00	0.000E+00	3.610E+00
3.446680E-01	-5.61786E+00	1.4316E+00	4.3609E+03	1.6056E+00	0.000E+00	3.597E+00
3.460536E-01	-1.09196E+01	1.4262E+00	4.3269E+03	1.6124E+00	0.000E+00	3.583E+00
3.482500E-01	-6.84427E+00	1.1000E+01	3.3163E+04	1.6230E+00	0.000E+00	3.560E+00
3.496500E-01	-7.47210E+00	1.0949E+01	3.2876E+04	1.6297E+00	0.000E+00	3.546E+00
3.517500E-01	-3.36124E+00	1.5626E+01	4.6641E+04	1.6398E+00	0.000E+00	3.525E+00
3.533280E-01	-1.51093E+00	1.5545E+01	4.6191E+04	1.6474E+00	0.000E+00	3.509E+00
3.570000E-01	1.07948E+00	1.5358E+01	4.5167E+04	1.6648E+00	0.000E+00	3.473E+00
3.671099E-01	4.79675E+00	1.4866E+01	4.2515E+04	1.7121E+00	0.000E+00	3.377E+00
3.924405E-01	8.98735E+00	1.3749E+01	3.6782E+04	1.8257E+00	0.000E+00	3.159E+00
4.195189E-01	1.10578E+01	1.2683E+01	3.1740E+04	1.9397E+00	0.000E+00	2.955E+00
4.290440E-01	1.13462E+01	1.2334E+01	3.0183E+04	1.9781E+00	0.000E+00	2.890E+00
4.356110E-01	1.10638E+01	1.2102E+01	2.9167E+04	2.0039E+00	0.000E+00	2.846E+00
4.373622E-01	1.03698E+01	1.2041E+01	2.8904E+04	2.0108E+00	0.000E+00	2.835E+00
4.399890E-01	1.13158E+01	1.3502E+01	3.2219E+04	2.0209E+00	0.000E+00	2.818E+00
4.465560E-01	1.23521E+01	1.3275E+01	3.1211E+04	2.0461E+00	0.000E+00	2.776E+00
4.484657E-01	1.25462E+01	1.3210E+01	3.0926E+04	2.0533E+00	0.000E+00	2.765E+00
4.794098E-01	1.45209E+01	1.2219E+01	2.6761E+04	2.1657E+00	0.000E+00	2.586E+00
5.124891E-01	1.58108E+01	1.1265E+01	2.3078E+04	2.2761E+00	0.000E+00	2.419E+00
5.478508E-01	1.67789E+01	1.0357E+01	1.9849E+04	2.3836E+00	0.000E+00	2.263E+00
5.856525E-01	1.75280E+01	9.5000E+00	1.7031E+04	2.4874E+00	0.000E+00	2.117E+00
6.260625E-01	1.81133E+01	8.6947E+00	1.4581E+04	2.5867E+00	0.000E+00	1.980E+00
6.692609E-01	1.85712E+01	7.9426E+00	1.2460E+04	2.6807E+00	0.000E+00	1.853E+00
7.154399E-01	1.89290E+01	7.2440E+00	1.0631E+04	2.7687E+00	0.000E+00	1.733E+00
7.648052E-01	1.92085E+01	6.5931E+00	9.0509E+03	2.8499E+00	0.000E+00	1.621E+00
8.175768E-01	1.94180E+01	5.9873E+00	7.6887E+03	2.9237E+00	0.000E+00	1.516E+00
8.739896E-01	1.95708E+01	5.4288E+00	6.5215E+03	2.9896E+00	0.000E+00	1.419E+00
9.342948E-01	1.96784E+01	4.9166E+00	5.5250E+03	3.0470E+00	0.000E+00	1.327E+00
9.987612E-01	1.97509E+01	4.4486E+00	4.6764E+03	3.0954E+00	0.000E+00	1.241E+00
1.067676E+00	1.98007E+01	4.0045E+00	3.9379E+03	3.1346E+00	0.000E+00	1.161E+00
1.141345E+00	1.98129E+01	3.6007E+00	3.3122E+03	3.1644E+00	0.000E+00	1.086E+00
1.220098E+00	1.98020E+01	3.2354E+00	2.7841E+03	3.1844E+00	0.000E+00	1.016E+00
1.304285E+00	1.97743E+01	2.9062E+00	2.3394E+03	3.1948E+00	0.000E+00	9.506E-01
1.394281E+00	1.97367E+01	2.6095E+00	1.9649E+03	3.1955E+00	0.000E+00	8.892E-01
1.490486E+00	1.96846E+01	2.3292E+00	1.6407E+03	3.1866E+00	0.000E+00	8.318E-01
1.593329E+00	1.96197E+01	2.0811E+00	1.3713E+03	3.1683E+00	0.000E+00	7.781E-01
1.703269E+00	1.95480E+01	1.8618E+00	1.1476E+03	3.1410E+00	0.000E+00	7.279E-01
1.820795E+00	1.94721E+01	1.6627E+00	9.5876E+02	3.1049E+00	0.000E+00	6.809E-01
1.946430E+00	1.93889E+01	1.4833E+00	8.0011E+02	3.0606E+00	0.000E+00	6.370E-01
2.080733E+00	1.93001E+01	1.3245E+00	6.6834E+02	3.0085E+00	0.000E+00	5.959E-01
2.224304E+00	1.92061E+01	1.1839E+00	5.5880E+02	2.9492E+00	0.000E+00	5.574E-01
2.377781E+00	1.91059E+01	1.0591E+00	4.6765E+02	2.8832E+00	0.000E+00	5.214E-01
2.541848E+00	1.89976E+01	9.4843E-01	3.9175E+02	2.8112E+00	0.000E+00	4.878E-01
2.717235E+00	1.88776E+01	8.5013E-01	3.2848E+02	2.7339E+00	0.000E+00	4.563E-01
2.904724E+00	1.87401E+01	7.6275E-01	2.7569E+02	2.6519E+00	0.000E+00	4.268E-01
3.105150E+00	1.85764E+01	6.7803E-01	2.2925E+02	2.5660E+00	0.000E+00	3.993E-01
3.319406E+00	1.83498E+01	5.9753E-01	1.8900E+02	2.4767E+00	0.000E+00	3.735E-01
3.548445E+00	1.80080E+01	5.2709E-01	1.5596E+02	2.3848E+00	0.000E+00	3.494E-01
3.793288E+00	1.73592E+01	4.6540E-01	1.2881E+02	2.2909E+00	0.000E+00	3.269E-01
3.957338E+00	1.62338E+01	4.3026E-01	1.1415E+02	2.2306E+00	0.000E+00	3.133E-01
4.017909E+00	1.47223E+01	4.1835E-01	1.0932E+02	2.2089E+00	0.000E+00	3.086E-01
4.034062E+00	1.28987E+01	4.1526E-01	1.0808E+02	2.2031E+00	0.000E+00	3.073E-01
4.055024E+00	1.45470E+01	4.0127E+00	1.0390E+03	2.1957E+00	9.325E+02	3.058E-01
4.058290E+00	1.47569E+01	4.0068E+00	1.0366E+03	2.1945E+00	9.303E+02	3.055E-01

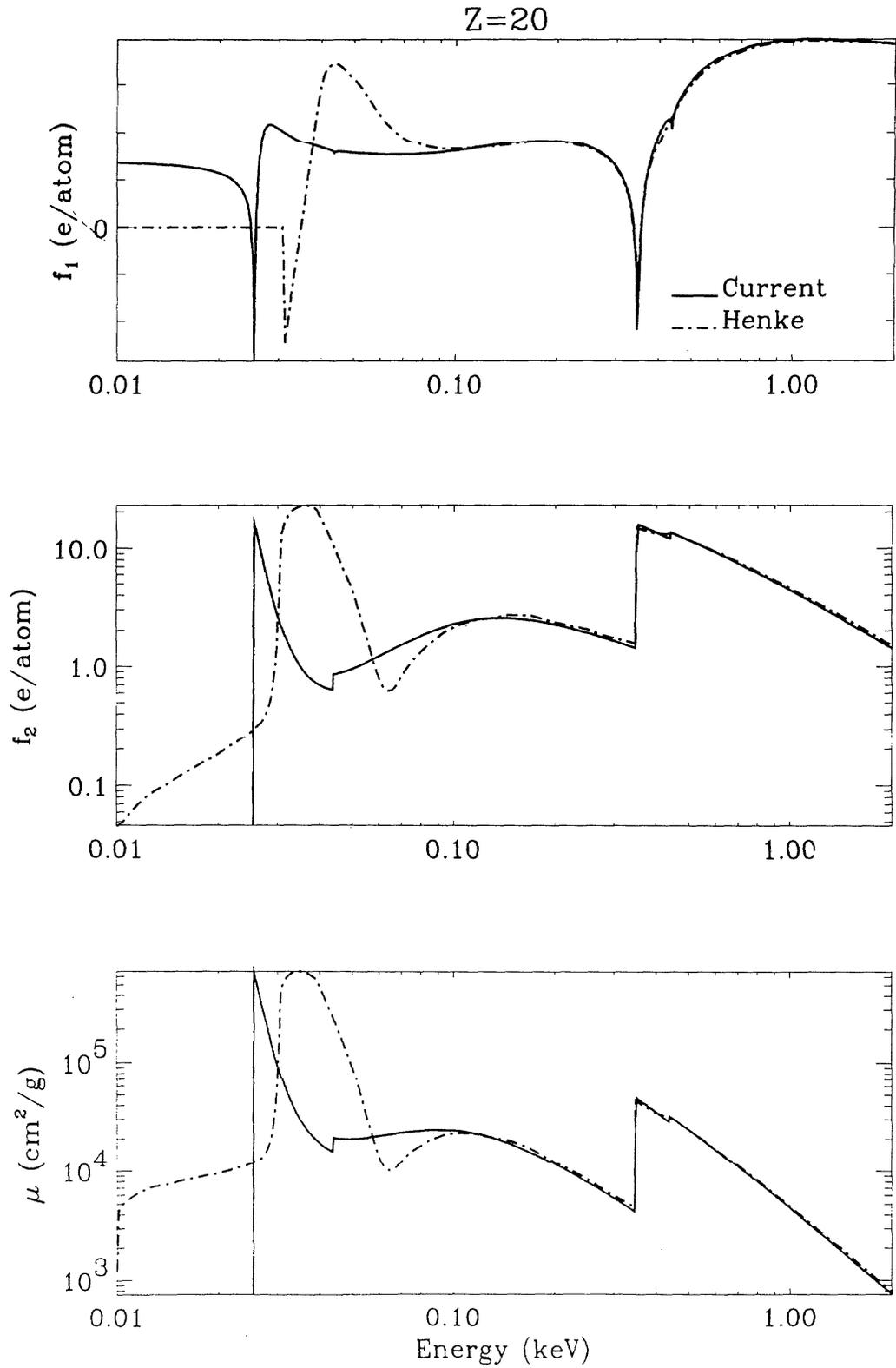
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 187

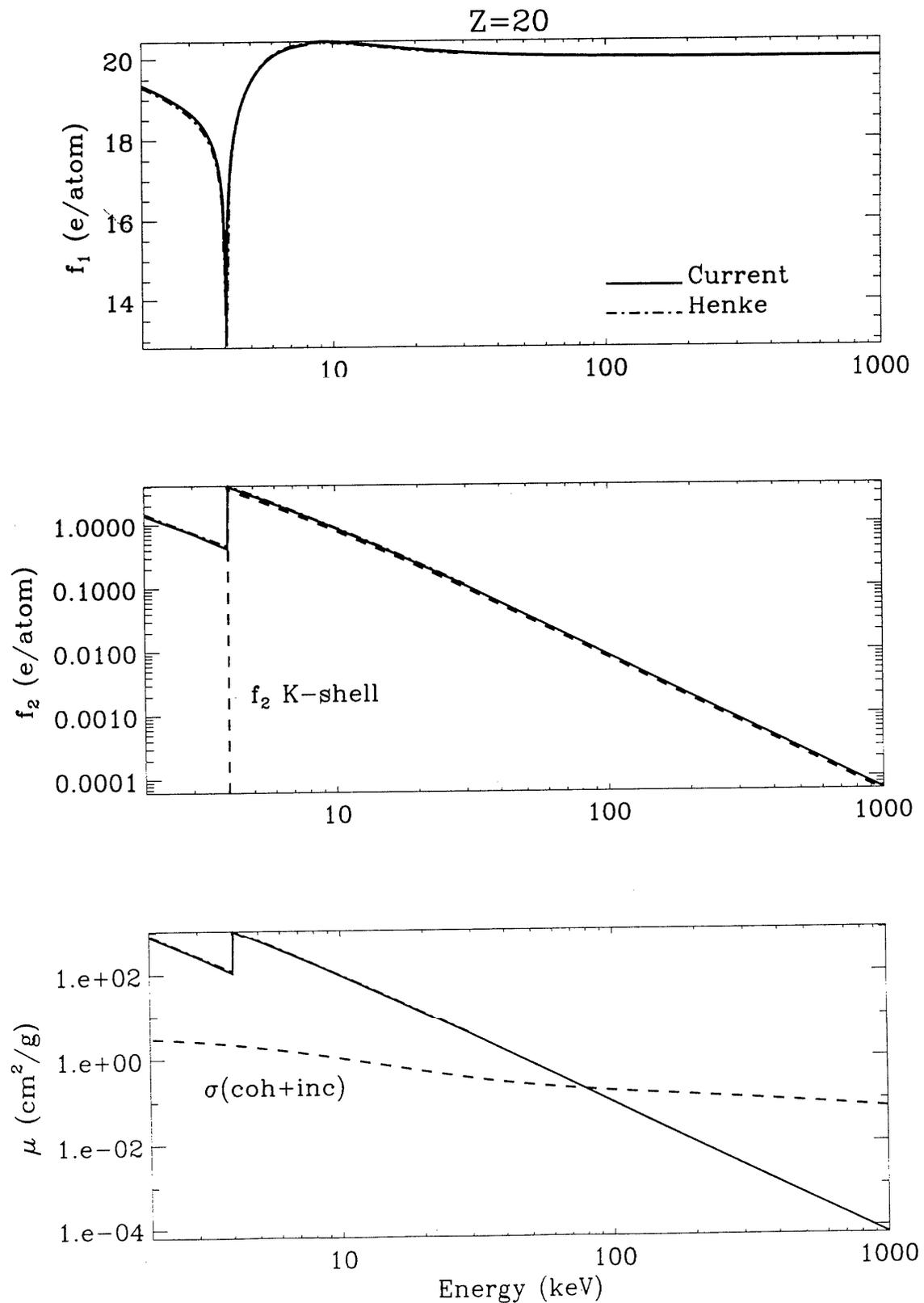
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.118862E+00	1.64400E+01	3.8997E+00	9.9405E+02	2.1733E+00	8.922E+02	3.010E-01
4.334821E+00	1.80590E+01	3.3640E+00	8.6321E+02	2.0998E+00	7.751E+02	2.860E-01
4.633924E+00	1.88984E+01	3.1991E+00	7.2483E+02	2.0037E+00	6.518E+02	2.676E-01
4.953664E+00	1.93754E+01	2.8820E+00	6.1083E+02	1.9080E+00	5.503E+02	2.503E-01
5.295467E+00	1.96982E+01	2.5972E+00	5.1493E+02	1.8133E+00	4.647E+02	2.341E-01
5.660855E+00	1.99277E+01	2.3263E+00	4.3146E+02	1.7199E+00	3.898E+02	2.190E-01
6.051453E+00	2.00785E+01	2.0813E+00	3.6110E+02	1.6283E+00	3.264E+02	2.049E-01
6.469004E+00	2.01876E+01	1.8605E+00	3.0195E+02	1.5388E+00	2.731E+02	1.917E-01
6.915365E+00	2.02632E+01	1.6616E+00	2.5228E+02	1.4519E+00	2.283E+02	1.793E-01
7.392525E+00	2.03145E+01	1.4837E+00	2.1072E+02	1.3676E+00	1.908E+02	1.677E-01
7.902609E+00	2.03488E+01	1.3249E+00	1.7602E+02	1.2864E+00	1.595E+02	1.569E-01
8.447890E+00	2.04090E+01	1.1797E+00	1.4661E+02	1.2083E+00	1.329E+02	1.468E-01
9.030794E+00	2.04237E+01	1.0471E+00	1.2173E+02	1.1335E+00	1.104E+02	1.373E-01
9.653919E+00	2.04210E+01	9.2433E-01	1.0052E+02	1.0622E+00	9.126E+01	1.284E-01
1.032004E+01	2.04108E+01	8.1604E-01	8.3020E+01	9.9438E-01	7.544E+01	1.201E-01
1.103212E+01	2.03960E+01	7.2049E-01	6.8568E+01	9.3008E-01	6.236E+01	1.124E-01
1.179334E+01	2.03780E+01	6.3616E-01	5.6635E+01	8.6934E-01	5.155E+01	1.051E-01
1.260708E+01	2.03582E+01	5.6174E-01	4.6781E+01	8.1211E-01	4.261E+01	9.834E-02
1.347697E+01	2.03376E+01	4.9605E-01	3.8644E+01	7.5836E-01	3.522E+01	9.200E-02
1.440688E+01	2.03166E+01	4.3807E-01	3.1924E+01	7.0801E-01	2.911E+01	8.606E-02
1.540095E+01	2.02959E+01	3.8688E-01	2.6374E+01	6.6099E-01	2.407E+01	8.050E-02
1.646362E+01	2.02759E+01	3.4169E-01	2.1790E+01	6.1718E-01	1.989E+01	7.531E-02
1.759961E+01	2.02569E+01	3.0162E-01	1.7993E+01	5.7646E-01	1.643E+01	7.045E-02
1.881298E+01	2.02384E+01	2.6458E-01	1.4765E+01	5.3872E-01	1.348E+01	6.590E-02
2.011215E+01	2.02201E+01	2.3209E-01	1.2116E+01	5.0380E-01	1.106E+01	6.165E-02
2.149988E+01	2.02026E+01	2.0359E-01	9.9419E+00	4.7158E-01	9.073E+00	5.767E-02
2.298338E+01	2.01860E+01	1.7860E-01	8.1585E+00	4.4189E-01	7.443E+00	5.395E-02
2.456923E+01	2.01706E+01	1.5668E-01	6.6953E+00	4.1461E-01	6.106E+00	5.046E-02
2.626450E+01	2.01564E+01	1.3745E-01	5.4947E+00	3.8956E-01	5.009E+00	4.721E-02
2.807676E+01	2.01430E+01	1.1986E-01	4.4820E+00	3.6661E-01	4.086E+00	4.416E-02
3.001405E+01	2.01302E+01	1.0431E-01	3.6488E+00	3.4562E-01	3.327E+00	4.131E-02
3.208502E+01	2.01182E+01	9.0778E-02	2.9705E+00	3.2643E-01	2.709E+00	3.864E-02
3.429889E+01	2.01071E+01	7.9005E-02	2.4184E+00	3.0890E-01	2.205E+00	3.615E-02
3.666551E+01	2.00969E+01	6.8760E-02	1.9689E+00	2.9292E-01	1.796E+00	3.381E-02
3.919543E+01	2.00875E+01	5.9846E-02	1.6031E+00	2.7834E-01	1.462E+00	3.163E-02
4.189992E+01	2.00789E+01	5.2088E-02	1.3052E+00	2.6505E-01	1.190E+00	2.959E-02
4.479101E+01	2.00711E+01	4.5337E-02	1.0627E+00	2.5294E-01	9.691E-01	2.768E-02
4.788159E+01	2.00639E+01	3.9461E-02	8.6527E-01	2.4188E-01	7.890E-01	2.589E-02
5.118542E+01	2.00575E+01	3.4348E-02	7.0454E-01	2.3179E-01	6.424E-01	2.422E-02
5.471721E+01	2.00516E+01	2.9897E-02	5.7367E-01	2.2256E-01	5.230E-01	2.266E-02
5.849270E+01	2.00463E+01	2.6024E-02	4.6712E-01	2.1411E-01	4.259E-01	2.120E-02
6.252870E+01	2.00415E+01	2.2653E-02	3.8037E-01	2.0636E-01	3.467E-01	1.983E-02
6.684318E+01	2.00372E+01	1.9719E-02	3.0973E-01	1.9923E-01	2.823E-01	1.855E-02
7.145536E+01	2.00333E+01	1.7165E-02	2.5221E-01	1.9265E-01	2.298E-01	1.735E-02
7.638578E+01	2.00298E+01	1.4942E-02	2.0538E-01	1.8656E-01	1.871E-01	1.623E-02
8.165640E+01	2.00267E+01	1.2994E-02	1.6708E-01	1.8090E-01	1.522E-01	1.518E-02
8.729069E+01	2.00239E+01	1.1274E-02	1.3561E-01	1.7562E-01	1.236E-01	1.420E-02
9.331374E+01	2.00213E+01	9.7822E-03	1.1006E-01	1.7068E-01	1.003E-01	1.329E-02
9.975239E+01	2.00190E+01	8.4877E-03	8.9334E-02	1.6602E-01	8.140E-02	1.243E-02
1.066353E+02	2.00170E+01	7.3645E-03	7.2509E-02	1.6162E-01	6.607E-02	1.163E-02
1.139931E+02	2.00151E+01	6.3900E-03	5.8853E-02	1.5744E-01	5.362E-02	1.088E-02
1.218587E+02	2.00135E+01	5.5445E-03	4.7770E-02	1.5345E-01	4.352E-02	1.017E-02
1.302669E+02	2.00120E+01	4.8109E-03	3.8774E-02	1.4963E-01	3.533E-02	9.518E-03
1.392553E+02	2.00107E+01	4.1744E-03	3.1473E-02	1.4595E-01	2.867E-02	8.903E-03
1.488640E+02	2.00095E+01	3.6222E-03	2.5547E-02	1.4239E-01	2.327E-02	8.329E-03
1.591356E+02	2.00084E+01	3.1430E-03	2.0736E-02	1.3893E-01	1.889E-02	7.791E-03
1.701159E+02	2.00075E+01	2.7273E-03	1.6832E-02	1.3557E-01	1.533E-02	7.288E-03
1.818539E+02	2.00067E+01	2.3665E-03	1.3663E-02	1.3228E-01	1.245E-02	6.818E-03
1.944018E+02	2.00059E+01	2.0535E-03	1.1090E-02	1.2906E-01	1.010E-02	6.378E-03
2.078156E+02	2.00053E+01	1.7819E-03	9.0025E-03	1.2591E-01	8.199E-03	5.966E-03
2.221548E+02	2.00047E+01	1.5463E-03	7.3076E-03	1.2280E-01	6.655E-03	5.581E-03
2.374835E+02	2.00041E+01	1.3418E-03	5.9319E-03	1.1974E-01	5.401E-03	5.221E-03
2.538699E+02	2.00037E+01	1.1643E-03	4.8152E-03	1.1672E-01	4.384E-03	4.884E-03
2.713869E+02	2.00033E+01	1.0104E-03	3.9087E-03	1.1374E-01	3.558E-03	4.569E-03
2.901126E+02	2.00029E+01	8.7675E-04	3.1729E-03	1.1080E-01	2.888E-03	4.274E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
3.101304E+02	2.00026E+01	7.6082E-04	2.5756E-03	1.0789E-01	2.344E-03	3.998E-03
3.315294E+02	2.00023E+01	6.6022E-04	2.0908E-03	1.0502E-01	1.903E-03	3.740E-03
3.544049E+02	2.00020E+01	5.7292E-04	1.6973E-03	1.0217E-01	1.544E-03	3.498E-03
3.788588E+02	2.00018E+01	4.9717E-04	1.3778E-03	9.9365E-02	1.254E-03	3.273E-03
4.050001E+02	2.00016E+01	4.3144E-04	1.1184E-03	9.6588E-02	1.017E-03	3.061E-03
4.329451E+02	2.00014E+01	3.7440E-04	9.0793E-04	9.3844E-02	8.259E-04	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 191

Sc Z = 21

Atomic weight = 4.495590E+01 g/mol, nominal density ρ (g/cm³) = 2.9800E+00

μ_0 (barns/atom) = μ (cm²/g) \times 7.46511E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 9.36035E+05

7 edges. Edge energies (keV):

K	4.49280E+00	L	I	5.00400E-00	L	II	4.06700E-00	L	III	4.02200E-01
M	I	5.38000E-02	M	II	3.23000E-02	M	III	3.23000E-02		

Relativistic correction estimate f_{rel} (H82.3/5CL) = -6.5705E-02, -4.0800E-02 e/atom
 Nuclear Thomson correction f_{NT} = -5.3814E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	8.43172E+00	0.0000E+00	0.0000E+00	1.2810E-04	0.000E+00	1.160E+02
1.142761E-02	8.42010E+00	0.0000E+00	0.0000E+00	1.7410E-04	0.000E+00	1.085E+02
1.221612E-02	8.40652E+00	0.0000E+00	0.0000E+00	2.3532E-04	0.000E+00	1.015E+02
1.305903E-02	8.39057E+00	0.0000E+00	0.0000E+00	3.1634E-04	0.000E+00	9.494E+01
1.396010E-02	8.37174E+00	0.0000E+00	0.0000E+00	4.2297E-04	0.000E+00	8.881E+01
1.492335E-02	8.34938E+00	0.0000E+00	0.0000E+00	5.6250E-04	0.000E+00	8.308E+01
1.595306E-02	8.32265E+00	0.0000E+00	0.0000E+00	7.4409E-04	0.000E+00	7.772E+01
1.705382E-02	8.29040E+00	0.0000E+00	0.0000E+00	9.7907E-04	0.000E+00	7.270E+01
1.823053E-02	8.25104E+00	0.0000E+00	0.0000E+00	1.2810E-03	0.000E+00	6.801E+01
1.948844E-02	8.20232E+00	0.0000E+00	0.0000E+00	1.6686E-03	0.000E+00	6.362E+01
2.083314E-02	8.14085E+00	0.0000E+00	0.0000E+00	2.1613E-03	0.000E+00	5.951E+01
2.227063E-02	8.06127E+00	0.0000E+00	0.0000E+00	2.7850E-03	0.000E+00	5.567E+01
2.380730E-02	7.95448E+00	0.0000E+00	0.0000E+00	3.5704E-03	0.000E+00	5.208E+01
2.545001E-02	7.80327E+00	0.0000E+00	0.0000E+00	4.5540E-03	0.000E+00	4.872E+01
2.720606E-02	7.56991E+00	0.0000E+00	0.0000E+00	5.7792E-03	0.000E+00	4.557E+01
2.908327E-02	7.14726E+00	0.0000E+00	0.0000E+00	7.2971E-03	0.000E+00	4.263E+01
3.109002E-02	5.98986E+00	0.0000E+00	0.0000E+00	9.1678E-03	0.000E+00	3.988E+01
3.165400E-02	5.06744E+00	0.0000E+00	0.0000E+00	9.7409E-03	0.000E+00	3.917E+01
3.213850E-02	2.64257E+00	0.0000E+00	0.0000E+00	1.0250E-02	0.000E+00	3.858E+01
3.226770E-02	-5.72539E-01	0.0000E+00	0.0000E+00	1.0389E-02	0.000E+00	3.842E+01
3.246150E-02	3.30677E+00	6.4655E+00	1.8643E+05	1.0598E-02	0.000E+00	3.819E+01
3.294600E-02	6.66886E+00	5.6490E+00	1.6050E+05	1.1134E-02	0.000E+00	3.763E+01
3.323523E-02	7.54411E+00	5.2166E+00	1.4692E+05	1.1461E-02	0.000E+00	3.731E+01
3.552846E-02	9.63779E+00	2.8403E+00	7.4830E+04	1.4257E-02	0.000E+00	3.490E+01
3.797993E-02	9.68356E+00	1.6748E+00	4.1275E+04	1.7649E-02	0.000E+00	3.264E+01
4.060054E-02	9.47617E+00	1.1417E+00	2.6322E+04	2.1742E-02	0.000E+00	3.054E+01
4.340198E-02	9.26018E+00	8.7736E-01	1.8922E+04	2.6654E-02	0.000E+00	2.857E+01
4.639671E-02	9.06182E+00	7.4331E-01	1.4996E+04	3.2521E-02	0.000E+00	2.672E+01
4.959809E-02	8.86608E+00	6.8109E-01	1.2854E+04	3.9490E-02	0.000E+00	2.500E+01
5.272400E-02	8.62098E+00	6.6398E-01	1.1788E+04	4.6981E-02	0.000E+00	2.352E+01
5.302035E-02	8.58033E+00	6.6389E-01	1.1720E+04	4.7726E-02	0.000E+00	2.338E+01
5.353100E-02	8.46296E+00	6.6425E-01	1.1615E+04	4.9023E-02	0.000E+00	2.316E+01
5.374620E-02	8.30602E+00	6.6459E-01	1.1574E+04	4.9575E-02	0.000E+00	2.307E+01
5.406900E-02	8.44091E+00	9.5669E-01	1.6562E+04	5.0409E-02	0.000E+00	2.293E+01
5.487600E-02	8.54012E+00	9.6596E-01	1.6477E+04	5.2525E-02	0.000E+00	2.259E+01
5.667876E-02	8.57621E+00	9.9135E-01	1.6372E+04	5.7409E-02	0.000E+00	2.187E+01
6.058959E-02	8.56318E+00	1.0641E+00	1.6439E+04	6.8736E-02	0.000E+00	2.046E+01
6.477028E-02	8.53831E+00	1.1580E+00	1.6735E+04	8.1919E-02	0.000E+00	1.914E+01
6.923942E-02	8.52042E+00	1.2694E+00	1.7161E+04	9.7182E-02	0.000E+00	1.791E+01
7.401695E-02	8.51531E+00	1.3961E+00	1.7655E+04	1.1476E-01	0.000E+00	1.675E+01
7.912411E-02	8.52654E+00	1.5357E+00	1.8167E+04	1.3492E-01	0.000E+00	1.567E+01
8.458368E-02	8.55692E+00	1.6854E+00	1.8651E+04	1.5790E-01	0.000E+00	1.466E+01
9.041995E-02	8.60871E+00	1.8415E+00	1.9063E+04	1.8397E-01	0.000E+00	1.371E+01
9.665893E-02	8.68337E+00	1.9997E+00	1.9365E+04	2.1340E-01	0.000E+00	1.283E+01
1.033284E-01	8.77778E+00	2.1550E+00	1.9521E+04	2.4646E-01	0.000E+00	1.200E+01
1.104581E-01	8.89838E+00	2.3021E+00	1.9508E+04	2.8340E-01	0.000E+00	1.122E+01
1.180797E-01	9.03950E+00	2.4359E+00	1.9309E+04	3.2447E-01	0.000E+00	1.050E+01
1.262272E-01	9.19793E+00	2.5515E+00	1.8921E+04	3.6991E-01	0.000E+00	9.822E+00
1.349368E-01	9.36968E+00	2.6440E+00	1.8341E+04	4.1992E-01	0.000E+00	9.188E+00
1.442475E-01	9.54736E+00	2.7074E+00	1.7569E+04	4.7468E-01	0.000E+00	8.595E+00
1.542005E-01	9.72191E+00	2.7405E+00	1.6635E+04	5.3435E-01	0.000E+00	8.040E+00
1.648404E-01	9.88537E+00	2.7441E+00	1.5582E+04	5.9903E-01	0.000E+00	7.521E+00
1.762144E-01	1.00286E+01	2.7203E+00	1.4450E+04	6.6877E-01	0.000E+00	7.036E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.883732E-01	1.01445E+01	2.6722E+00	1.3278E+04	7.4360E-01	0.000E+00	6.582E+00
2.013709E-01	1.02257E+01	2.6035E+00	1.2102E+04	8.2347E-01	0.000E+00	6.157E+00
2.152655E-01	1.02646E+01	2.5182E+00	1.0950E+04	9.0826E-01	0.000E+00	5.760E+00
2.301188E-01	1.02526E+01	2.4200E+00	9.8438E+03	9.9780E-01	0.000E+00	5.388E+00
2.459970E-01	1.01788E+01	2.3126E+00	8.7998E+03	1.0919E+00	0.000E+00	5.040E+00
2.629708E-01	1.00285E+01	2.1994E+00	7.8286E+03	1.1901E+00	0.000E+00	4.715E+00
2.811158E-01	9.77881E+00	2.0831E+00	6.9361E+03	1.2922E+00	0.000E+00	4.410E+00
3.005128E-01	9.39216E+00	1.9662E+00	6.1243E+03	1.3977E+00	0.000E+00	4.126E+00
3.212482E-01	8.79907E+00	1.8506E+00	5.3922E+03	1.5060E+00	0.000E+00	3.859E+00
3.434143E-01	7.85136E+00	1.7377E+00	4.7365E+03	1.6166E+00	0.000E+00	3.610E+00
3.671099E-01	6.14027E+00	1.6287E+00	4.1526E+03	1.7289E+00	0.000E+00	3.377E+00
3.924405E-01	1.46616E+00	1.5241E+00	3.6353E+03	1.8422E+00	0.000E+00	3.159E+00
3.941560E-01	7.48834E-01	1.5175E+00	3.6036E+03	1.8496E+00	0.000E+00	3.146E+00
3.985660E-01	-2.14125E+00	1.5006E+00	3.5241E+03	1.8685E+00	0.000E+00	3.111E+00
4.001890E-01	-4.20296E+00	1.4944E+00	3.4954E+03	1.8754E+00	0.000E+00	3.098E+00
4.017978E-01	-9.45344E+00	1.4884E+00	3.4673E+03	1.8822E+00	0.000E+00	3.086E+00
4.042110E-01	-5.39644E+00	1.1021E+01	2.5522E+04	1.8924E+00	0.000E+00	3.067E+00
4.046665E-01	-5.05260E+00	1.1006E+01	2.5459E+04	1.8943E+00	0.000E+00	3.064E+00
4.062933E-01	-5.85041E+00	1.0953E+01	2.5234E+04	1.9012E+00	0.000E+00	3.052E+00
4.087335E-01	-1.85144E+00	1.5603E+01	3.5733E+04	1.9114E+00	0.000E+00	3.033E+00
4.102440E-01	-3.08777E-01	1.5533E+01	3.5442E+04	1.9176E+00	0.000E+00	3.022E+00
4.148340E-01	2.49519E+00	1.5325E+01	3.4579E+04	1.9366E+00	0.000E+00	2.989E+00
4.195189E-01	4.28326E+00	1.5117E+01	3.3728E+04	1.9556E+00	0.000E+00	2.955E+00
4.484657E-01	9.51097E+00	1.3937E+01	2.9089E+04	2.0686E+00	0.000E+00	2.765E+00
4.794098E-01	1.18389E+01	1.2824E+01	2.5038E+04	2.1802E+00	0.000E+00	2.586E+00
4.903920E-01	1.21697E+01	1.2458E+01	2.3779E+04	2.2176E+00	0.000E+00	2.528E+00
4.978980E-01	1.18920E+01	1.2216E+01	2.2966E+04	2.2426E+00	0.000E+00	2.490E+00
4.998996E-01	1.11773E+01	1.2152E+01	2.2755E+04	2.2491E+00	0.000E+00	2.480E+00
5.029020E-01	1.21617E+01	1.3665E+01	2.5433E+04	2.2589E+00	0.000E+00	2.465E+00
5.104080E-01	1.32441E+01	1.3427E+01	2.4623E+04	2.2830E+00	0.000E+00	2.429E+00
5.124891E-01	1.34384E+01	1.3362E+01	2.4405E+04	2.2896E+00	0.000E+00	2.419E+00
5.478508E-01	1.55039E+01	1.2329E+01	2.1064E+04	2.3961E+00	0.000E+00	2.263E+00
5.856525E-01	1.68387E+01	1.1350E+01	1.8141E+04	2.4988E+00	0.000E+00	2.117E+00
6.260625E-01	1.78352E+01	1.0419E+01	1.5578E+04	2.5969E+00	0.000E+00	1.980E+00
6.692609E-01	1.86004E+01	9.5373E+00	1.3339E+04	2.6896E+00	0.000E+00	1.853E+00
7.154399E-01	1.91936E+01	8.7119E+00	1.1398E+04	2.7762E+00	0.000E+00	1.733E+00
7.648052E-01	1.96541E+01	7.9434E+00	9.7219E+03	2.8560E+00	0.000E+00	1.621E+00
8.175768E-01	2.00108E+01	7.2315E+00	8.2793E+03	2.9284E+00	0.000E+00	1.516E+00
8.739896E-01	2.02868E+01	6.5712E+00	7.0377E+03	2.9928E+00	0.000E+00	1.419E+00
9.342948E-01	2.04928E+01	5.9594E+00	5.9705E+03	3.0487E+00	0.000E+00	1.327E+00
9.987612E-01	2.06451E+01	5.3984E+00	5.0593E+03	3.0957E+00	0.000E+00	1.241E+00
1.067676E+00	2.07586E+01	4.8649E+00	4.2651E+03	3.1335E+00	0.000E+00	1.161E+00
1.141345E+00	2.08218E+01	4.3780E+00	3.5905E+03	3.1618E+00	0.000E+00	1.086E+00
1.220098E+00	2.08494E+01	3.9360E+00	3.0196E+03	3.1805E+00	0.000E+00	1.016E+00
1.304285E+00	2.08499E+01	3.5362E+00	2.5378E+03	3.1896E+00	0.000E+00	9.506E-01
1.394281E+00	2.08295E+01	3.1759E+00	2.1321E+03	3.1890E+00	0.000E+00	8.892E-01
1.490486E+00	2.07942E+01	2.8520E+00	1.7911E+03	3.1789E+00	0.000E+00	8.318E-01
1.593329E+00	2.07506E+01	2.5615E+00	1.5048E+03	3.1596E+00	0.000E+00	7.781E-01
1.703269E+00	2.06959E+01	2.2906E+00	1.2588E+03	3.1313E+00	0.000E+00	7.279E-01
1.820795E+00	2.06294E+01	2.0483E+00	1.0530E+03	3.0943E+00	0.000E+00	6.809E-01
1.946430E+00	2.05567E+01	1.8338E+00	8.8186E+02	3.0492E+00	0.000E+00	6.370E-01
2.080733E+00	2.04800E+01	1.6391E+00	7.3736E+02	2.9964E+00	0.000E+00	5.959E-01
2.224304E+00	2.03965E+01	1.4635E+00	6.1588E+02	2.9365E+00	0.000E+00	5.574E-01
2.377781E+00	2.03074E+01	1.3080E+00	5.1489E+02	2.8700E+00	0.000E+00	5.214E-01
2.541848E+00	2.02132E+01	1.1701E+00	4.3088E+02	2.7976E+00	0.000E+00	4.878E-01
2.717235E+00	2.01132E+01	1.0477E+00	3.6091E+02	2.7200E+00	0.000E+00	4.563E-01
2.904724E+00	2.00074E+01	9.3904E-01	3.0260E+02	2.6377E+00	0.000E+00	4.268E-01
3.105150E+00	1.98896E+01	8.3405E-01	2.5142E+02	2.5516E+00	0.000E+00	3.993E-01
3.319406E+00	1.97362E+01	7.3458E-01	2.0714E+02	2.4622E+00	0.000E+00	3.735E-01
3.548445E+00	1.95416E+01	6.4760E-01	1.7083E+02	2.3703E+00	0.000E+00	3.494E-01
3.793288E+00	1.92752E+01	5.7147E-01	1.4102E+02	2.2764E+00	0.000E+00	3.269E-01
4.055024E+00	1.88520E+01	5.0478E-01	1.1652E+02	2.1813E+00	0.000E+00	3.058E-01
4.334821E+00	1.78700E+01	4.4631E-01	9.6373E+01	2.0855E+00	0.000E+00	2.860E-01
4.602944E+00	1.72904E+01	4.3371E-01	9.2203E+01	2.0630E+00	0.000E+00	2.816E-01
4.470336E+00	1.57929E+01	4.2180E-01	8.8319E+01	2.0412E+00	0.000E+00	2.773E-01

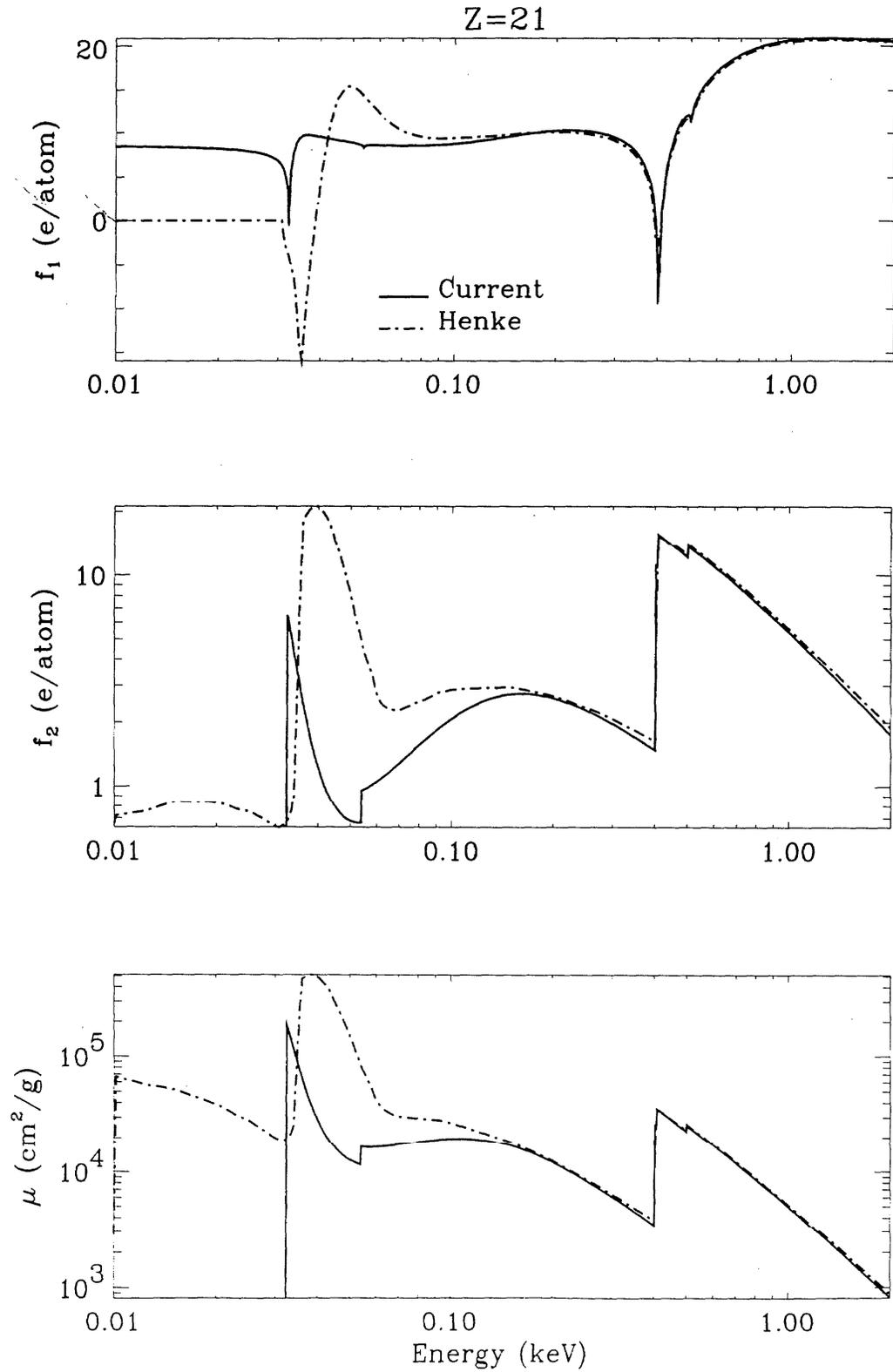
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 193

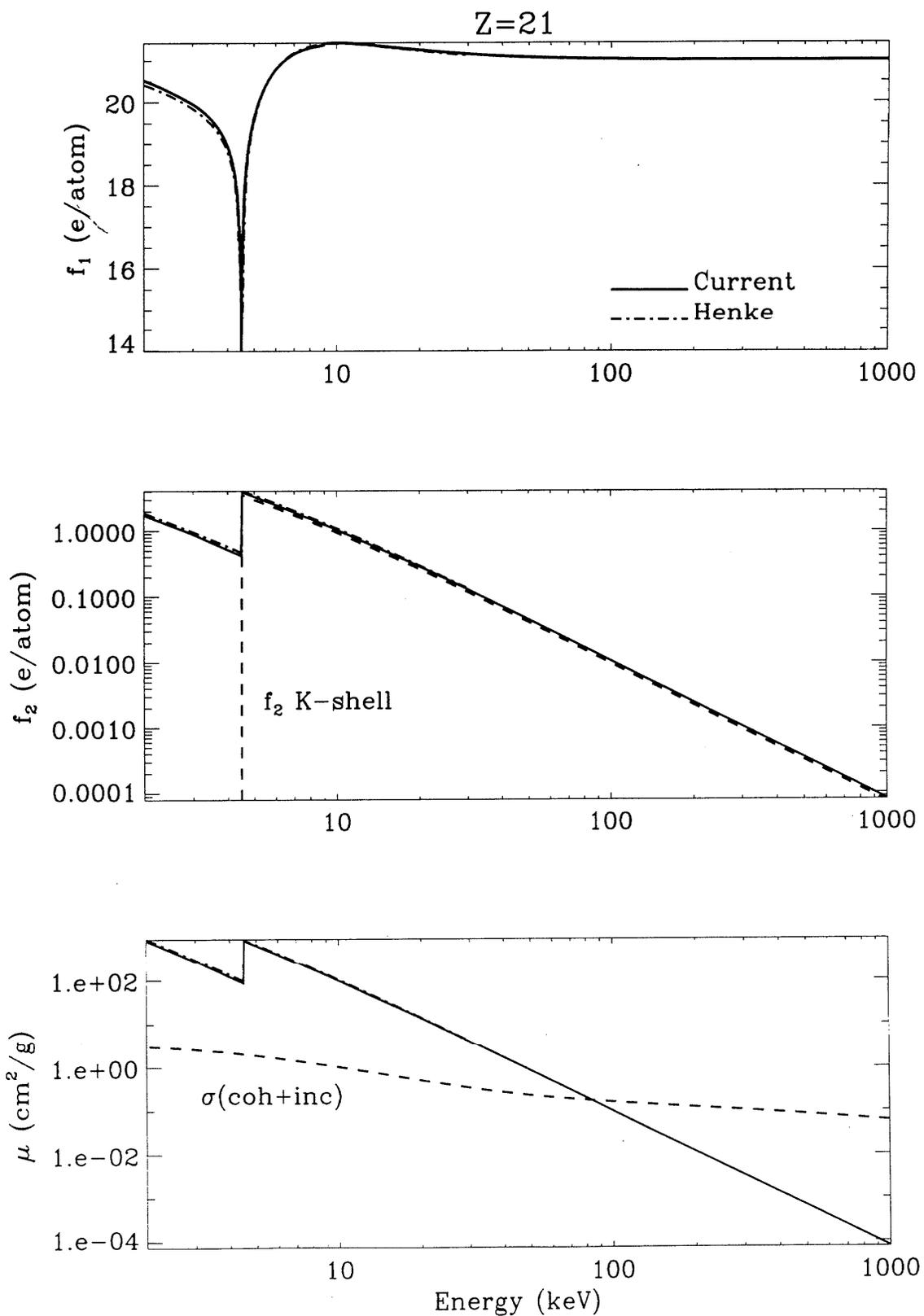
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.488307E+00	1.39862E+01	4.1871E-01	8.7321E+01	2.0354E+00	0.000E+00	2.762E-01
4.515264E+00	1.58273E+01	3.9769E+00	8.2443E+02	2.0268E+00	7.386E+02	2.746E-01
4.582656E+00	1.74949E+01	3.8694E+00	7.9036E+02	2.0055E+00	7.080E+02	2.706E-01
4.633924E+00	1.80517E+01	3.7907E+00	7.6570E+02	1.9896E+00	6.859E+02	2.676E-01
4.953664E+00	1.94991E+01	3.3816E+00	6.3898E+02	1.8941E+00	5.729E+02	2.503E-01
5.295467E+00	2.01389E+01	3.0409E+00	5.3752E+02	1.7995E+00	4.827E+02	2.341E-01
5.660855E+00	2.05351E+01	2.7420E+00	4.5340E+02	1.7064E+00	4.079E+02	2.190E-01
6.051453E+00	2.08130E+01	2.4648E+00	3.8125E+02	1.6150E+00	3.434E+02	2.049E-01
6.469004E+00	2.10038E+01	2.2063E+00	3.1924E+02	1.5258E+00	2.878E+02	1.917E-01
6.915365E+00	2.11368E+01	1.9727E+00	2.6702E+02	1.4390E+00	2.408E+02	1.793E-01
7.392525E+00	2.12296E+01	1.7627E+00	2.2319E+02	1.3550E+00	2.014E+02	1.677E-01
7.902609E+00	2.12935E+01	1.5741E+00	1.8645E+02	1.2740E+00	1.683E+02	1.569E-01
8.447890E+00	2.13369E+01	1.4055E+00	1.5573E+02	1.1962E+00	1.406E+02	1.468E-01
9.030794E+00	2.14081E+01	1.2534E+00	1.2992E+02	1.1216E+00	1.174E+02	1.373E-01
9.653919E+00	2.14223E+01	1.1075E+00	1.0739E+02	1.0505E+00	9.708E+01	1.284E-01
1.032004E+01	2.14230E+01	9.7833E-01	8.8735E+01	9.8288E-01	8.030E+01	1.201E-01
1.103212E+01	2.14153E+01	8.6426E-01	7.3330E+01	9.1877E-01	6.642E+01	1.124E-01
1.179334E+01	2.14022E+01	7.6355E-01	6.0603E+01	8.5818E-01	5.494E+01	1.051E-01
1.260708E+01	2.13854E+01	6.7462E-01	5.0088E+01	8.0110E-01	4.545E+01	9.834E-02
1.347697E+01	2.13664E+01	5.9608E-01	4.1401E+01	7.4749E-01	3.759E+01	9.200E-02
1.440688E+01	2.13461E+01	5.2672E-01	3.4222E+01	6.9726E-01	3.109E+01	8.606E-02
1.540095E+01	2.13254E+01	4.6545E-01	2.8289E+01	6.5033E-01	2.572E+01	8.050E-02
1.646362E+01	2.13047E+01	4.1134E-01	2.3386E+01	6.0661E-01	2.127E+01	7.531E-02
1.759961E+01	2.12844E+01	3.6353E-01	1.9334E+01	5.6598E-01	1.760E+01	7.045E-02
1.881398E+01	2.12651E+01	3.2129E-01	1.5985E+01	5.2829E-01	1.455E+01	6.590E-02
2.011215E+01	2.12467E+01	2.8301E-01	1.3171E+01	4.9344E-01	1.199E+01	6.165E-02
2.149988E+01	2.12285E+01	2.4840E-01	1.0815E+01	4.6126E-01	9.845E+00	5.767E-02
2.298338E+01	2.12108E+01	2.1804E-01	8.8800E+00	4.3161E-01	8.081E+00	5.395E-02
2.456923E+01	2.11940E+01	1.9139E-01	7.2916E+00	4.0436E-01	6.633E+00	5.046E-02
2.626450E+01	2.11783E+01	1.6800E-01	5.9873E+00	3.7934E-01	5.444E+00	4.721E-02
2.807676E+01	2.11637E+01	1.4661E-01	4.8878E+00	3.5642E-01	4.445E+00	4.416E-02
3.001405E+01	2.11496E+01	1.2771E-01	3.9828E+00	3.3544E-01	3.622E+00	4.131E-02
3.208502E+01	2.11362E+01	1.1124E-01	3.2454E+00	3.1627E-01	2.952E+00	3.864E-02
3.429889E+01	2.11237E+01	9.6904E-02	2.6446E+00	2.9877E-01	2.406E+00	3.615E-02
3.666551E+01	2.11122E+01	8.4416E-02	2.1551E+00	2.8280E-01	1.961E+00	3.381E-02
3.919543E+01	2.11015E+01	7.3539E-02	1.7562E+00	2.6825E-01	1.598E+00	3.163E-02
4.189992E+01	2.10917E+01	6.4065E-02	1.4312E+00	2.5498E-01	1.302E+00	2.959E-02
4.479101E+01	2.10827E+01	5.5812E-02	1.1664E+00	2.4289E-01	1.061E+00	2.768E-02
4.788159E+01	2.10746E+01	4.8624E-02	9.5055E-01	2.3186E-01	8.648E-01	2.589E-02
5.118542E+01	2.10671E+01	4.2363E-02	7.7470E-01	2.2180E-01	7.048E-01	2.422E-02
5.471721E+01	2.10604E+01	3.6908E-02	6.3138E-01	2.1261E-01	5.743E-01	2.266E-02
5.849270E+01	2.10543E+01	3.2157E-02	5.1459E-01	2.0421E-01	4.681E-01	2.120E-02
6.252870E+01	2.10487E+01	2.8018E-02	4.1941E-01	1.9650E-01	3.815E-01	1.983E-02
6.684318E+01	2.10437E+01	2.4411E-02	3.4184E-01	1.8943E-01	3.109E-01	1.855E-02
7.145536E+01	2.10392E+01	2.1270E-02	2.7863E-01	1.8291E-01	2.533E-01	1.735E-02
7.638578E+01	2.10351E+01	1.8533E-02	2.2710E-01	1.7688E-01	2.065E-01	1.623E-02
8.165640E+01	2.10315E+01	1.6131E-02	1.8491E-01	1.7130E-01	1.681E-01	1.518E-02
8.729069E+01	2.10282E+01	1.4007E-02	1.5020E-01	1.6610E-01	1.365E-01	1.420E-02
9.331374E+01	2.10252E+01	1.2162E-02	1.2200E-01	1.6124E-01	1.109E-01	1.329E-02
9.975239E+01	2.10225E+01	1.0561E-02	9.9096E-02	1.5668E-01	9.006E-02	1.243E-02
1.066353E+02	2.10201E+01	9.1701E-03	8.0495E-02	1.5238E-01	7.315E-02	1.163E-02
1.139931E+02	2.10179E+01	7.9628E-03	6.5385E-02	1.4831E-01	5.941E-02	1.088E-02
1.218587E+02	2.10160E+01	6.9145E-03	5.3113E-02	1.4443E-01	4.826E-02	1.017E-02
1.302669E+02	2.10143E+01	6.0043E-03	4.3144E-02	1.4072E-01	3.919E-02	9.518E-03
1.392553E+02	2.10127E+01	5.2140E-03	3.5047E-02	1.3716E-01	3.183E-02	8.903E-03
1.488640E+02	2.10113E+01	4.5277E-03	2.8470E-02	1.3373E-01	2.586E-02	8.329E-03
1.591356E+02	2.10101E+01	3.9318E-03	2.3127E-02	1.3041E-01	2.100E-02	7.791E-03
1.701159E+02	2.10090E+01	3.4143E-03	1.8787E-02	1.2719E-01	1.706E-02	7.288E-03
1.818339E+02	2.10080E+01	2.9650E-03	1.5261E-02	1.2405E-01	1.385E-02	6.818E-03
1.944018E+02	2.10071E+01	2.5748E-03	1.2398E-02	1.2098E-01	1.125E-02	6.378E-03
2.078156E+02	2.10063E+01	2.2360E-03	1.0071E-02	1.1798E-01	9.139E-03	5.966E-03
2.221548E+02	2.10056E+01	1.9418E-03	8.1817E-03	1.1503E-01	7.423E-03	5.581E-03
2.374835E+02	2.10050E+01	1.6863E-03	6.6466E-03	1.1213E-01	6.029E-03	5.221E-03
2.538699E+02	2.10044E+01	1.4645E-03	5.3995E-03	1.0928E-01	4.897E-03	4.884E-03
2.713869E+02	2.10039E+01	1.2718E-03	4.3865E-03	1.0647E-01	3.977E-03	4.569E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.901126E+02	2.10035E+01	1.1045E-03	3.5635E-03	1.0370E-01	3.230E-03	4.274E-03
3.101304E+02	2.10031E+01	9.5918E-04	2.8950E-03	1.0096E-01	2.624E-03	3.998E-03
3.315294E+02	2.10027E+01	8.3300E-04	2.3519E-03	9.8262E-02	2.131E-03	3.740E-03
3.544049E+02	2.10024E+01	7.2343E-04	1.9107E-03	9.5596E-02	1.731E-03	3.498E-03
3.788588E+02	2.10021E+01	6.2827E-04	1.5522E-03	9.2964E-02	1.406E-03	3.273E-03
4.050001E+02	2.10019E+01	5.4563E-04	1.2611E-03	9.0366E-02	1.142E-03	3.061E-03
4.329451E+02	2.10017E+01	4.7387E-04	1.0245E-03	8.7803E-02	9.274E-04	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 197

Tl Z = 22

Atomic weight = 4.788000E+01 g/mol, nominal density ρ (g/cm³) = 4.5300E+00

μ_0 (barns/atom) = μ (cm²/g) \times 7.95067E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 8.78870E+05

7 edges. Edge energies (keV):

K 4.96640E+00 L I 5.63700E-00 L II 4.61500E-00 L III 4.55500E-01
M I 6.03000E-02 M II 3.46000E-02 M III 3.46000E-02
Relativistic correction estimate f_{rel} (H82,3/5CL) = -7.3171E-02, -4.5000E-02 e/atom
Nuclear Thomson correction f_{NT} = -5.5454E-03 e/atom

<i>E</i> keV	<i>f</i> ₁ e/atom	<i>f</i> ₂ e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	9.42905E+00	0.0000E+00	0.0000E+00	1.4127E-04	0.000E+00	1.160E+02
1.142761E-02	9.42053E+00	0.0000E+00	0.0000E+00	1.9172E-04	0.000E+00	1.085E+02
1.221612E-02	9.41062E+00	0.0000E+00	0.0000E+00	2.5877E-04	0.000E+00	1.015E+02
1.305903E-02	9.39906E+00	0.0000E+00	0.0000E+00	3.4738E-04	0.000E+00	9.494E+01
1.396010E-02	9.38551E+00	0.0000E+00	0.0000E+00	4.6384E-04	0.000E+00	8.881E+01
1.492335E-02	9.36957E+00	0.0000E+00	0.0000E+00	6.1603E-04	0.000E+00	8.308E+01
1.595306E-02	9.35070E+00	0.0000E+00	0.0000E+00	8.1382E-04	0.000E+00	7.772E+01
1.705382E-02	9.32824E+00	0.0000E+00	0.0000E+00	1.0694E-03	0.000E+00	7.270E+01
1.823053E-02	9.30127E+00	0.0000E+00	0.0000E+00	1.3980E-03	0.000E+00	6.801E+01
1.948844E-02	9.26856E+00	0.0000E+00	0.0000E+00	1.8180E-03	0.000E+00	6.362E+01
2.083314E-02	9.22834E+00	0.0000E+00	0.0000E+00	2.3520E-03	0.000E+00	5.951E+01
2.227063E-02	9.17803E+00	0.0000E+00	0.0000E+00	3.0271E-03	0.000E+00	5.567E+01
2.380730E-02	9.11359E+00	0.0000E+00	0.0000E+00	3.8762E-03	0.000E+00	5.208E+01
2.545001E-02	9.02823E+00	0.0000E+00	0.0000E+00	4.9383E-03	0.000E+00	4.872E+01
2.720606E-02	8.90939E+00	0.0000E+00	0.0000E+00	6.2598E-03	0.000E+00	4.557E+01
2.908327E-02	8.73001E+00	0.0000E+00	0.0000E+00	7.8952E-03	0.000E+00	4.263E+01
3.109002E-02	8.41542E+00	0.0000E+00	0.0000E+00	9.9085E-03	0.000E+00	3.988E+01
3.323523E-02	7.60473E+00	0.0000E+00	0.0000E+00	1.2374E-02	0.000E+00	3.731E+01
3.390800E-02	6.89881E+00	0.0000E+00	0.0000E+00	1.3215E-02	0.000E+00	3.656E+01
3.442700E-02	5.21284E+00	0.0000E+00	0.0000E+00	1.3886E-02	0.000E+00	3.601E+01
3.456540E-02	3.01476E+00	0.0000E+00	0.0000E+00	1.4069E-02	0.000E+00	3.587E+01
3.477300E-02	5.60428E+00	4.4077E+00	1.1140E+05	1.4345E-02	0.000E+00	3.566E+01
3.529200E-02	7.86368E+00	3.9360E+00	9.8018E+04	1.5049E-02	0.000E+00	3.513E+01
3.552846E-02	8.34078E+00	3.7403E+00	9.2523E+04	1.5377E-02	0.000E+00	3.490E+01
3.797993E-02	9.99065E+00	2.2468E+00	5.1992E+04	1.9015E-02	0.000E+00	3.264E+01
4.060054E-02	1.01319E+01	1.4413E+00	3.1199E+04	2.3402E-02	0.000E+00	3.054E+01
4.340198E-02	1.00332E+01	1.0503E+00	2.1267E+04	2.8661E-02	0.000E+00	2.857E+01
4.639671E-02	9.89691E+00	8.5004E-01	1.6102E+04	3.4936E-02	0.000E+00	2.672E+01
4.959809E-02	9.75735E+00	7.4921E-01	1.3276E+04	4.2383E-02	0.000E+00	2.500E+01
5.302035E-02	9.61388E+00	7.0691E-01	1.1718E+04	5.1176E-02	0.000E+00	2.338E+01
5.667876E-02	9.44458E+00	7.0362E-01	1.0910E+04	6.1505E-02	0.000E+00	2.187E+01
5.909400E-02	9.26972E+00	7.1680E-01	1.0661E+04	6.8837E-02	0.000E+00	2.098E+01
5.998850E-02	9.10085E+00	7.2413E-01	1.0607E+04	7.1685E-02	0.000E+00	2.066E+01
6.023970E-02	8.92474E+00	7.2628E-01	1.0596E+04	7.2454E-02	0.000E+00	2.058E+01
6.058959E-02	9.07958E+00	1.0619E+00	1.5404E+04	7.3576E-02	0.000E+00	2.046E+01
6.060150E-02	9.08350E+00	1.0621E+00	1.5403E+04	7.3615E-02	0.000E+00	2.046E+01
6.150600E-02	9.20754E+00	1.0777E+00	1.5399E+04	7.6555E-02	0.000E+00	2.016E+01
6.477028E-02	9.28310E+00	1.1418E+00	1.5493E+04	8.7612E-02	0.000E+00	1.914E+01
6.923942E-02	9.29671E+00	1.2446E+00	1.5797E+04	1.0385E-01	0.000E+00	1.791E+01
7.401695E-02	9.30317E+00	1.3647E+00	1.6205E+04	1.2254E-01	0.000E+00	1.675E+01
7.912411E-02	9.31776E+00	1.4997E+00	1.6658E+04	1.4394E-01	0.000E+00	1.567E+01
8.458368E-02	9.34680E+00	1.6471E+00	1.7114E+04	1.6833E-01	0.000E+00	1.466E+01
9.041995E-02	9.39422E+00	1.8036E+00	1.7531E+04	1.9598E-01	0.000E+00	1.371E+01
9.665893E-02	9.46274E+00	1.9656E+00	1.7872E+04	2.2717E-01	0.000E+00	1.283E+01
1.033284E-01	9.55397E+00	2.1285E+00	1.8104E+04	2.6217E-01	0.000E+00	1.200E+01
1.104581E-01	9.66065E+00	2.2874E+00	1.8200E+04	3.0126E-01	0.000E+00	1.122E+01
1.180797E-01	9.79749E+00	2.4371E+00	1.8139E+04	3.4469E-01	0.000E+00	1.050E+01
1.262272E-01	9.95464E+00	2.5726E+00	1.7912E+04	3.9270E-01	0.000E+00	9.822E+00
1.349368E-01	1.01290E+01	2.6893E+00	1.7516E+04	4.4551E-01	0.000E+00	9.188E+00
1.442475E-01	1.03167E+01	2.7827E+00	1.6955E+04	5.0330E-01	0.000E+00	8.595E+00
1.542005E-01	1.05109E+01	2.8469E+00	1.6226E+04	5.6622E-01	0.000E+00	8.040E+00
1.648404E-01	1.07029E+01	2.8809E+00	1.5360E+04	6.3439E-01	0.000E+00	7.521E+00
1.762144E-01	1.08847E+01	2.8854E+00	1.4391E+04	7.0785E-01	0.000E+00	7.036E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_x cm ² /g	λ nm
1.883732E-01	1.10503E+01	2.8628E+00	1.3356E+04	7.8662E-01	0.000E+00	6.582E+00
2.013709E-01	1.11902E+01	2.8158E+00	1.2289E+04	8.7064E-01	0.000E+00	6.157E+00
2.152655E-01	1.12992E+01	2.7480E+00	1.1219E+04	9.5980E-01	0.000E+00	5.760E+00
2.301188E-01	1.13710E+01	2.6634E+00	1.0172E+04	1.0539E+00	0.000E+00	5.388E+00
2.459970E-01	1.13988E+01	2.5655E+00	9.1657E+03	1.1527E+00	0.000E+00	5.040E+00
2.629708E-01	1.13743E+01	2.4579E+00	8.2145E+03	1.2558E+00	0.000E+00	4.715E+00
2.811158E-01	1.12871E+01	2.3437E+00	7.3273E+03	1.3629E+00	0.000E+00	4.410E+00
3.005128E-01	1.11216E+01	2.2258E+00	6.5096E+03	1.4735E+00	0.000E+00	4.126E+00
3.212482E-01	1.08540E+01	2.1067E+00	5.7634E+03	1.5871E+00	0.000E+00	3.859E+00
3.434143E-01	1.04440E+01	1.9881E+00	5.0881E+03	1.7030E+00	0.000E+00	3.610E+00
3.671099E-01	9.81571E+00	1.8718E+00	4.4811E+03	1.8206E+00	0.000E+00	3.377E+00
3.924405E-01	8.80332E+00	1.7587E+00	3.9386E+03	1.9391E+00	0.000E+00	3.159E+00
4.195189E-01	6.92604E+00	1.6498E+00	3.4562E+03	2.0578E+00	0.000E+00	2.955E+00
4.463900E-01	1.92843E+00	1.5526E+00	3.0568E+03	2.1677E+00	0.000E+00	2.777E+00
4.484657E-01	9.87301E-01	1.5455E+00	3.0288E+03	2.1759E+00	0.000E+00	2.765E+00
4.522700E-01	-1.76894E+00	1.5327E+00	2.9783E+03	2.1907E+00	0.000E+00	2.741E+00
4.532225E-01	-2.96272E+00	1.5295E+00	2.9659E+03	2.1944E+00	0.000E+00	2.736E+00
4.550445E-01	-8.18637E+00	1.5234E+00	2.9423E+03	2.2015E+00	0.000E+00	2.725E+00
4.577775E-01	-3.90944E+00	1.1107E+01	2.1324E+04	2.2120E+00	0.000E+00	2.708E+00
4.591925E-01	-3.08146E+00	1.1064E+01	2.1175E+04	2.2174E+00	0.000E+00	2.700E+00
4.610385E-01	-4.19430E+00	1.1008E+01	2.0984E+04	2.2244E+00	0.000E+00	2.689E+00
4.638075E-01	-3.65275E-01	1.5678E+01	2.9708E+04	2.2349E+00	0.000E+00	2.673E+00
4.646100E-01	0.44249E-01	1.5643E+01	2.9591E+04	2.2379E+00	0.000E+00	2.669E+00
4.707300E-01	3.83984E+00	1.5387E+01	2.8727E+04	2.2607E+00	0.000E+00	2.634E+00
4.794098E-01	6.44177E+00	1.5035E+01	2.7563E+04	2.2925E+00	0.000E+00	2.585E+00
5.124891E-01	1.10633E+01	1.3816E+01	2.3693E+04	2.4068E+00	0.000E+00	2.419E+00
5.478508E-01	1.30866E+01	1.2665E+01	2.0317E+04	2.5179E+00	0.000E+00	2.263E+00
5.524260E-01	1.31659E+01	1.2526E+01	1.9928E+04	2.5315E+00	0.000E+00	2.244E+00
5.608815E-01	1.28802E+01	1.2274E+01	1.9233E+04	2.5562E+00	0.000E+00	2.211E+00
5.631363E-01	1.21445E+01	1.2208E+01	1.9053E+04	2.5627E+00	0.000E+00	2.202E+00
5.665185E-01	1.31577E+01	1.3763E+01	2.1351E+04	2.5723E+00	0.000E+00	2.189E+00
5.749740E-01	1.42700E+01	1.3515E+01	2.0658E+04	2.5960E+00	0.000E+00	2.156E+00
5.856525E-01	1.50556E+01	1.3211E+01	1.9825E+04	2.6251E+00	0.000E+00	2.117E+00
6.260625E-01	1.69001E+01	1.2153E+01	1.7060E+04	2.7274E+00	0.000E+00	1.980E+00
6.692609E-01	1.81505E+01	1.1157E+01	1.4652E+04	2.8240E+00	0.000E+00	1.853E+00
7.154399E-01	1.90837E+01	1.0224E+01	1.2559E+04	2.9142E+00	0.000E+00	1.733E+00
7.648052E-01	1.98089E+01	9.3601E+00	1.0756E+04	2.9972E+00	0.000E+00	1.621E+00
8.175768E-01	2.03785E+01	8.5328E+00	9.1725E+03	3.0725E+00	0.000E+00	1.516E+00
8.739896E-01	2.08094E+01	7.7655E+00	7.8089E+03	3.1393E+00	0.000E+00	1.419E+00
9.342948E-01	2.11416E+01	7.0640E+00	6.6449E+03	3.1973E+00	0.000E+00	1.327E+00
9.987612E-01	2.14337E+01	6.4217E+00	5.6509E+03	3.2459E+00	0.000E+00	1.241E+00
1.067676E+00	2.16411E+01	5.7774E+00	4.7557E+03	3.2849E+00	0.000E+00	1.161E+00
1.141345E+00	2.17616E+01	5.1954E+00	4.0006E+03	3.3139E+00	0.000E+00	1.086E+00
1.220098E+00	2.18304E+01	4.6702E+00	3.3641E+03	3.3329E+00	0.000E+00	1.016E+00
1.304285E+00	2.18617E+01	4.1983E+00	2.8289E+03	3.3419E+00	0.000E+00	9.506E-01
1.394281E+00	2.18659E+01	3.7746E+00	2.3793E+03	3.3407E+00	0.000E+00	8.892E-01
1.490486E+00	2.18498E+01	3.3947E+00	2.0017E+03	3.3297E+00	0.000E+00	8.318E-01
1.593329E+00	2.18189E+01	3.0542E+00	1.6847E+03	3.3089E+00	0.000E+00	7.781E-01
1.703269E+00	2.17801E+01	2.7492E+00	1.4186E+03	3.2788E+00	0.000E+00	7.279E-01
1.820795E+00	2.17335E+01	2.4762E+00	1.1952E+03	3.2397E+00	0.000E+00	6.809E-01
1.946430E+00	2.16786E+01	2.2158E+00	1.0005E+03	3.1920E+00	0.000E+00	6.370E-01
2.080733E+00	2.16125E+01	1.9839E+00	8.3797E+02	3.1364E+00	0.000E+00	5.959E-01
2.224304E+00	2.15408E+01	1.7785E+00	7.0272E+02	3.0733E+00	0.000E+00	5.574E-01
2.377781E+00	2.14645E+01	1.5901E+00	5.8772E+02	3.0033E+00	0.000E+00	5.214E-01
2.541848E+00	2.13815E+01	1.4215E+00	4.9151E+02	2.9272E+00	0.000E+00	4.878E-01
2.717235E+00	2.12933E+01	1.2720E+00	4.1144E+02	2.8457E+00	0.000E+00	4.563E-01
2.904724E+00	2.12005E+01	1.1394E+00	3.4473E+02	2.7593E+00	0.000E+00	4.268E-01
3.105150E+00	2.11027E+01	1.0116E+00	2.8633E+02	2.6689E+00	0.000E+00	3.993E-01
3.319406E+00	2.09847E+01	8.9095E-01	2.3589E+02	2.5750E+00	0.000E+00	3.735E-01
3.548445E+00	2.08432E+01	7.8546E-01	1.9454E+02	2.4786E+00	0.000E+00	3.494E-01
3.793288E+00	2.06701E+01	6.9316E-01	1.6060E+02	2.3801E+00	0.000E+00	3.269E-01
4.055024E+00	2.04452E+01	6.1232E-01	1.3271E+02	2.2803E+00	0.000E+00	3.058E-01
4.334821E+00	2.01195E+01	5.4145E-01	1.0978E+02	2.1798E+00	0.000E+00	2.860E-01
4.633924E+00	1.95302E+01	4.7926E-01	9.0896E+01	2.0792E+00	0.000E+00	2.676E-01
4.867072E+00	1.83295E+01	4.3839E-01	7.9162E+01	2.0055E+00	0.000E+00	2.547E-01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 199

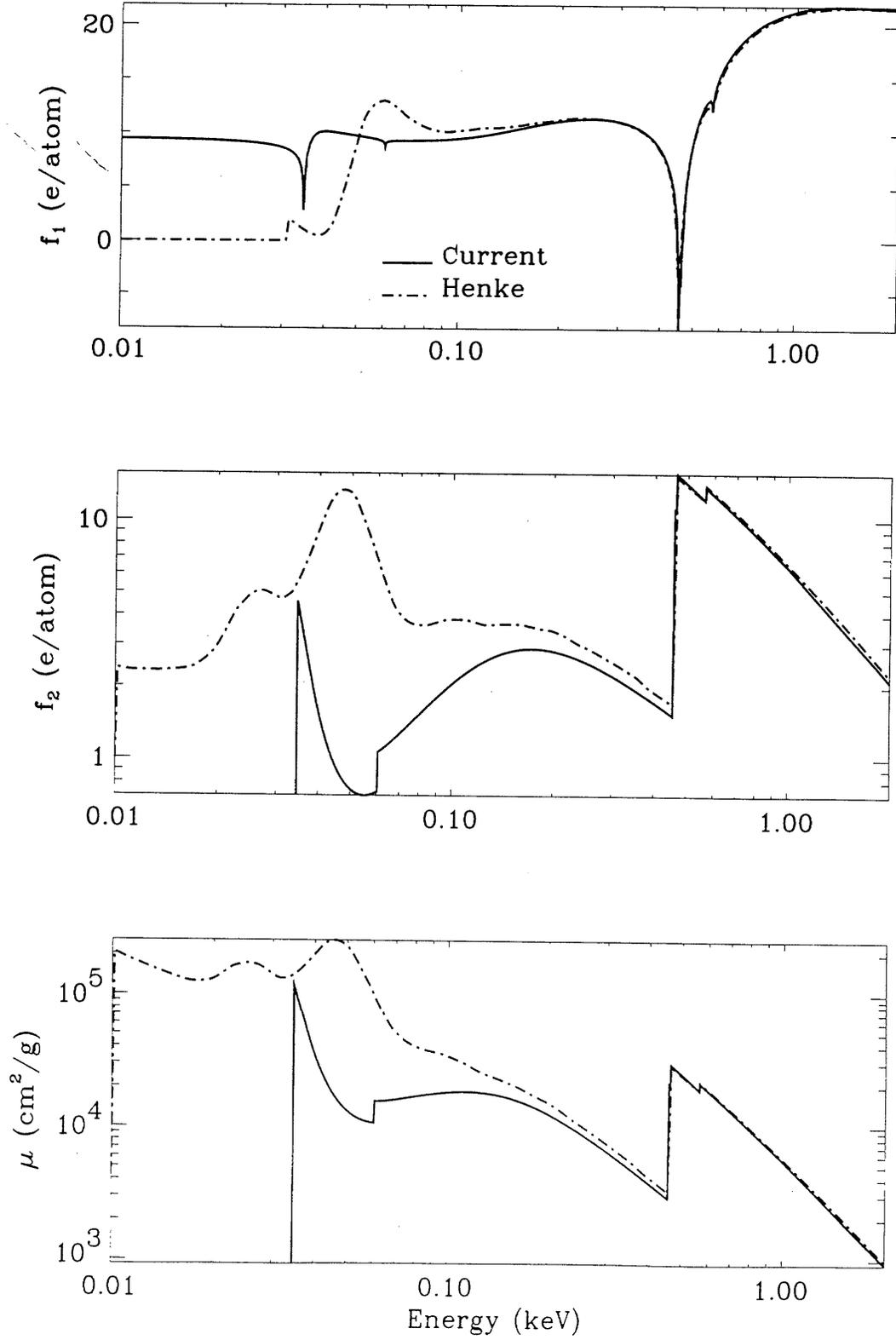
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

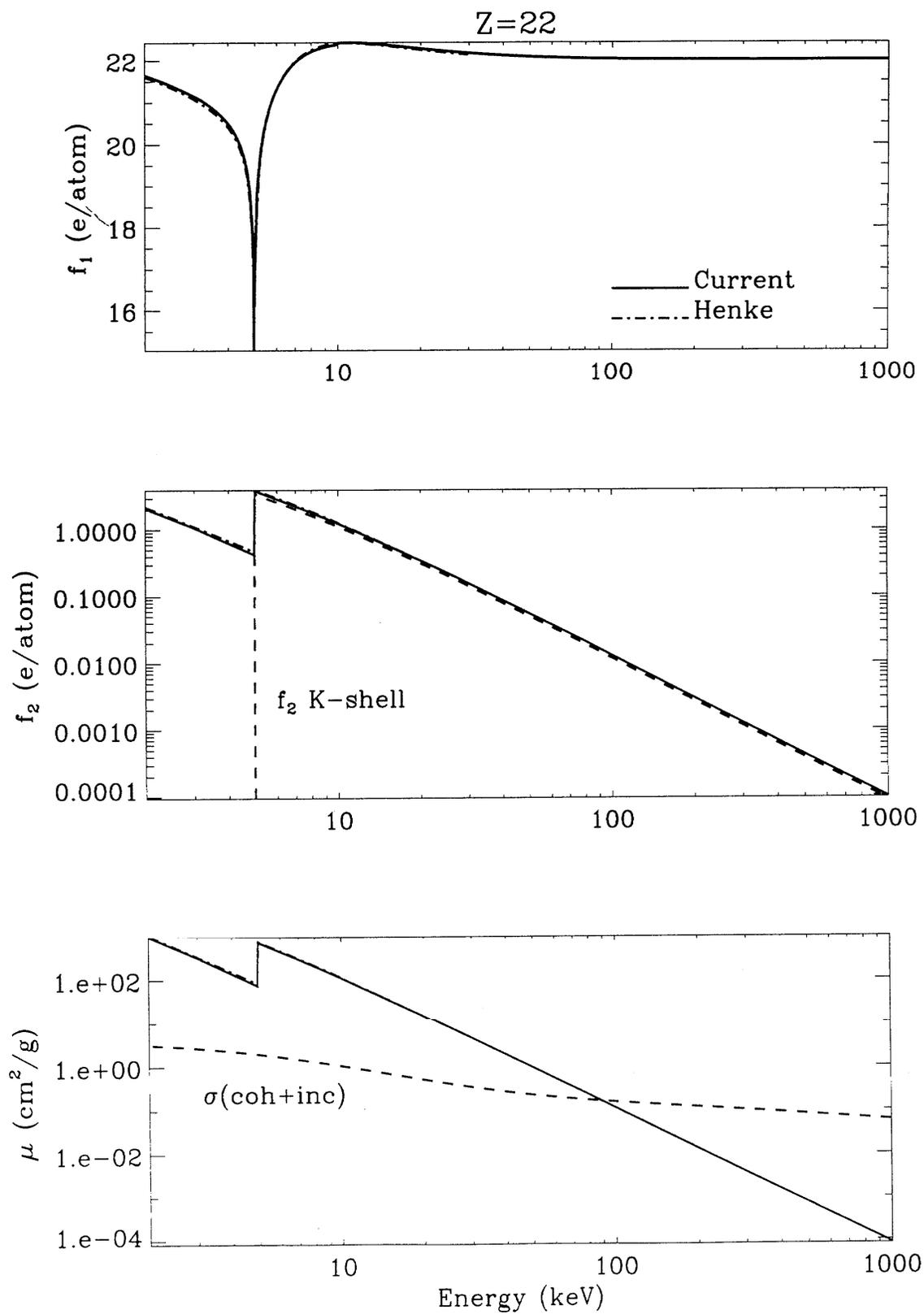
E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.941568E+00	1.68446E+01	4.2651E-01	7.5855E+01	1.9827E+00	0.000E+00	2.509E-01
4.953664E+00	1.61067E+01	4.2463E-01	7.5337E+01	1.9791E+00	0.000E+00	2.503E-01
4.961434E+00	1.50532E+01	4.2343E-01	7.5006E+01	1.9767E+00	0.000E+00	2.499E-01
4.991232E+00	1.68795E+01	3.9516E+00	6.9381E+02	1.9578E+00	6.221E+02	2.484E-01
5.065728E+00	1.85331E+01	3.8444E+00	6.6698E+02	1.9457E+00	5.962E+02	2.448E-01
5.295467E+00	1.99941E+01	3.5500E+00	5.8919E+02	1.8799E+00	5.267E+02	2.341E-01
5.660855E+00	2.08781E+01	3.1852E+00	4.9451E+02	1.7822E+00	4.426E+02	2.190E-01
6.051453E+00	2.13665E+01	2.8699E+00	4.1681E+02	1.6864E+00	3.737E+02	2.049E-01
6.469004E+00	2.16932E+01	2.5886E+00	3.5168E+02	1.5928E+00	3.158E+02	1.917E-01
6.915365E+00	2.19215E+01	2.3196E+00	2.9479E+02	1.5018E+00	2.649E+02	1.793E-01
7.392525E+00	2.20793E+01	2.0760E+00	2.4681E+02	1.4137E+00	2.219E+02	1.677E-01
7.902609E+00	2.21897E+01	1.8566E+00	2.0648E+02	1.3288E+00	1.857E+02	1.569E-01
8.447890E+00	2.22671E+01	1.6599E+00	1.7269E+02	1.2471E+00	1.553E+02	1.468E-01
9.030794E+00	2.23223E+01	1.4823E+00	1.4426E+02	1.1689E+00	1.298E+02	1.373E-01
9.653919E+00	2.23587E+01	1.3190E+00	1.2008E+02	1.0942E+00	1.082E+02	1.284E-01
1.032004E+01	2.24196E+01	1.1692E+00	9.9571E+01	1.0233E+00	8.979E+01	1.201E-01
1.103212E+01	2.24250E+01	1.0330E+00	8.2293E+01	9.5597E-01	7.426E+01	1.124E-01
1.179334E+01	2.24203E+01	9.1250E-01	6.8002E+01	8.9237E-01	6.142E+01	1.051E-01
1.260708E+01	2.24091E+01	8.0612E-01	5.6196E+01	8.3244E-01	5.080E+01	9.834E-02
1.347697E+01	2.23936E+01	7.1218E-01	4.6444E+01	7.7613E-01	4.202E+01	9.200E-02
1.440688E+01	2.23754E+01	6.2924E-01	3.8386E+01	7.2338E-01	3.475E+01	8.606E-02
1.540095E+01	2.23555E+01	5.5599E-01	3.1728E+01	6.7409E-01	2.874E+01	8.050E-02
1.646362E+01	2.23348E+01	4.9128E-01	2.6226E+01	6.2815E-01	2.377E+01	7.531E-02
1.759961E+01	2.23139E+01	4.3414E-01	2.1679E+01	5.8545E-01	1.966E+01	7.045E-02
1.881398E+01	2.22934E+01	3.8365E-01	1.7922E+01	5.4584E-01	1.626E+01	6.590E-02
2.011215E+01	2.22735E+01	3.3906E-01	1.4816E+01	5.0920E-01	1.345E+01	6.165E-02
2.149988E+01	2.22547E+01	2.9966E-01	1.2250E+01	4.7537E-01	1.112E+01	5.767E-02
2.298338E+01	2.22365E+01	2.6320E-01	1.0064E+01	4.4420E-01	9.136E+00	5.395E-02
2.456923E+01	2.22186E+01	2.3115E-01	8.2686E+00	4.1554E-01	7.503E+00	5.046E-02
2.626450E+01	2.22014E+01	2.0302E-01	6.7934E+00	3.8923E-01	6.162E+00	4.721E-02
2.807676E+01	2.21864E+01	1.7732E-01	5.5507E+00	3.6511E-01	5.035E+00	4.416E-02
3.001405E+01	2.21708E+01	1.5460E-01	4.5269E+00	3.4305E-01	4.107E+00	4.131E-02
3.208502E+01	2.21559E+01	1.3479E-01	3.6921E+00	3.2288E-01	3.350E+00	3.864E-02
3.429889E+01	2.21420E+01	1.1752E-01	3.0113E+00	3.0447E-01	2.733E+00	3.615E-02
3.666551E+01	2.21289E+01	1.0247E-01	2.4561E+00	2.8768E-01	2.229E+00	3.381E-02
3.919543E+01	2.21169E+01	8.9345E-02	2.0034E+00	2.7237E-01	1.819E+00	3.163E-02
4.189992E+01	2.21058E+01	7.7906E-02	1.6341E+00	2.5842E-01	1.483E+00	2.959E-02
4.479101E+01	2.20957E+01	6.7933E-02	1.3329E+00	2.4571E-01	1.210E+00	2.768E-02
4.788159E+01	2.20863E+01	5.9238E-02	1.0873E+00	2.3413E-01	9.871E-01	2.589E-02
5.118542E+01	2.20779E+01	5.1657E-02	8.6977E-01	2.2357E-01	8.052E-01	2.422E-02
5.471721E+01	2.20701E+01	4.5047E-02	7.2355E-01	2.1393E-01	6.568E-01	2.266E-02
5.849270E+01	2.20631E+01	3.9284E-02	5.9026E-01	2.0512E-01	5.358E-01	2.120E-02
6.252870E+01	2.20568E+01	3.4259E-02	4.8153E-01	1.9706E-01	4.370E-01	1.983E-02
6.684318E+01	2.20510E+01	2.9877E-02	3.9284E-01	1.8966E-01	3.565E-01	1.855E-02
7.145536E+01	2.20458E+01	2.6057E-02	3.2048E-01	1.8285E-01	2.908E-01	1.735E-02
7.638578E+01	2.20411E+01	2.2725E-02	2.6146E-01	1.7657E-01	2.372E-01	1.623E-02
8.165640E+01	2.20369E+01	1.9787E-02	2.1297E-01	1.7076E-01	1.932E-01	1.518E-02
8.729069E+01	2.20331E+01	1.7165E-02	1.7282E-01	1.6536E-01	1.568E-01	1.420E-02
9.331374E+01	2.20297E+01	1.4891E-02	1.4025E-01	1.6033E-01	1.272E-01	1.329E-02
9.975239E+01	2.20266E+01	1.2918E-02	1.1382E-01	1.5561E-01	1.033E-01	1.243E-02
1.066353E+02	2.20237E+01	1.1207E-02	9.2368E-02	1.5118E-01	8.380E-02	1.163E-02
1.139931E+02	2.20212E+01	9.7228E-03	7.4961E-02	1.4699E-01	6.800E-02	1.088E-02
1.218587E+02	2.20189E+01	8.4351E-03	6.0836E-02	1.4302E-01	5.519E-02	1.017E-02
1.302669E+02	2.20169E+01	7.3180E-03	4.9372E-02	1.3923E-01	4.478E-02	9.518E-03
1.392553E+02	2.20150E+01	6.3489E-03	4.0069E-02	1.3560E-01	3.634E-02	8.903E-03
1.488640E+02	2.20134E+01	5.5082E-03	3.2520E-02	1.3211E-01	2.949E-02	8.329E-03
1.591356E+02	2.20119E+01	4.7789E-03	2.6394E-02	1.2875E-01	2.394E-02	7.791E-03
1.701159E+02	2.20106E+01	4.1462E-03	2.1420E-02	1.2549E-01	1.942E-02	7.288E-03
1.818539E+02	2.20094E+01	3.5972E-03	1.7385E-02	1.2232E-01	1.576E-02	6.818E-03
1.944018E+02	2.20084E+01	3.1210E-03	1.4110E-02	1.1924E-01	1.279E-02	6.378E-03
2.078156E+02	2.20075E+01	2.7079E-03	1.1452E-02	1.1623E-01	1.038E-02	5.966E-03
2.221548E+02	2.20066E+01	2.3494E-03	9.2946E-03	1.1328E-01	8.425E-03	5.581E-03
2.374835E+02	2.20059E+01	2.0384E-03	7.5438E-03	1.1038E-01	6.837E-03	5.221E-03
2.538699E+02	2.20052E+01	1.7686E-03	6.1229E-03	1.0754E-01	5.548E-03	4.884E-03
2.713869E+02	2.20046E+01	1.5346E-03	4.9696E-03	1.0475E-01	4.503E-03	4.569E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.901126E+02	2.20041E+01	1.3315E-03	4.0336E-03	1.0200E-01	3.654E-03	4.274E-03
3.101304E+02	2.20037E+01	1.1553E-03	3.2739E-03	9.9285E-02	2.965E-03	3.998E-03
3.315294E+02	2.20032E+01	1.0024E-03	2.6573E-03	9.6615E-02	2.406E-03	3.740E-03
3.544049E+02	2.20029E+01	8.6974E-04	2.1568E-03	9.3982E-02	1.953E-03	3.498E-03
3.788588E+02	2.20025E+01	7.5465E-04	1.7506E-03	9.1387E-02	1.585E-03	3.273E-03
4.050001E+02	2.20023E+01	6.5480E-04	1.4209E-03	8.8829E-02	1.286E-03	3.061E-03
4.329451E+02	2.20020E+01	5.6816E-04	1.1534E-03	8.6308E-02	1.044E-03	2.864E-03

Z=22





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 203

V Z = 23

Atomic weight = 5.094150E+01 g/mol, nominal density ρ (g/cm³) = 6.1000E+00

μ_a (barns/atom) = μ (cm²/g) \times 8.45904E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 8.26052E+05

δ edges. Edge energies (keV):

K		5.46510E+00	L	I	6.28200E-00	L	II	5.20500E-00	L	III	5.12900E-01
M	I	6.65000E-02	M	II	3.78000E-02	M	III	3.78000E-02	M	IV	2.20000E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -8.1133E-02, -5.0400E-02 e/atom
 Nuclear Thomson correction f_{NT} = -5.6967E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	6.03298E+00	1.3926E+00	1.0761E+05	1.4704E-04	0.000E+00	1.160E+02
1.142761E-02	6.07191E+00	1.4821E+00	1.0713E+05	1.9954E-04	0.000E+00	1.085E+02
1.221612E-02	6.11684E+00	1.5754E+00	1.0653E+05	2.6931E-04	0.000E+00	1.015E+02
1.305903E-02	6.16824E+00	1.6720E+00	1.0576E+05	3.6151E-04	0.000E+00	9.494E+01
1.396010E-02	6.22652E+00	1.7714E+00	1.0482E+05	4.8268E-04	0.000E+00	8.881E+01
1.492335E-02	6.29198E+00	1.8729E+00	1.0367E+05	6.4102E-04	0.000E+00	8.308E+01
1.595306E-02	6.36478E+00	1.9757E+00	1.0230E+05	8.4679E-04	0.000E+00	7.772E+01
1.705382E-02	6.44492E+00	2.0791E+00	1.0071E+05	1.1127E-03	0.000E+00	7.270E+01
1.823053E-02	6.53219E+00	2.1821E+00	9.8873E+04	1.4545E-03	0.000E+00	6.801E+01
1.948844E-02	6.62612E+00	2.2838E+00	9.6802E+04	1.8914E-03	0.000E+00	6.362E+01
2.083314E-02	6.72589E+00	2.3833E+00	9.4499E+04	2.4469E-03	0.000E+00	5.951E+01
2.227063E-02	6.83025E+00	2.4796E+00	9.1974E+04	3.1492E-03	0.000E+00	5.567E+01
2.380730E-02	6.93728E+00	2.5720E+00	8.9242E+04	4.0324E-03	0.000E+00	5.208E+01
2.545001E-02	7.04404E+00	2.6595E+00	8.6323E+04	5.1372E-03	0.000E+00	4.872E+01
2.720606E-02	7.14583E+00	2.7415E+00	8.3240E+04	6.5117E-03	0.000E+00	4.557E+01
2.908327E-02	7.23437E+00	2.8172E+00	8.0018E+04	8.2128E-03	0.000E+00	4.263E+01
3.109002E-02	7.29311E+00	2.8862E+00	7.6686E+04	1.0307E-02	0.000E+00	3.988E+01
3.323523E-02	7.28097E+00	2.9480E+00	7.3272E+04	1.2871E-02	0.000E+00	3.731E+01
3.552846E-02	7.04435E+00	3.0024E+00	6.9808E+04	1.5995E-02	0.000E+00	3.490E+01
3.704400E-02	6.31229E+00	3.0326E+00	6.7625E+04	1.8280E-02	0.000E+00	3.347E+01
3.761100E-02	5.04483E+00	3.0429E+00	6.6831E+04	1.9180E-02	0.000E+00	3.296E+01
3.776220E-02	3.35785E+00	3.0455E+00	6.6621E+04	1.9424E-02	0.000E+00	3.283E+01
3.797993E-02	5.28829E+00	6.4585E+00	1.4047E+05	1.9779E-02	0.000E+00	3.264E+01
3.798900E-02	5.34875E+00	6.4533E+00	1.4032E+05	1.9794E-02	0.000E+00	3.264E+01
3.855600E-02	7.12733E+00	6.1450E+00	1.3165E+05	2.0736E-02	0.000E+00	3.216E+01
4.060054E-02	8.81634E+00	5.2816E+00	1.0746E+05	2.4342E-02	0.000E+00	3.054E+01
4.340198E-02	9.44378E+00	4.4661E+00	8.5002E+04	2.9813E-02	0.000E+00	2.857E+01
4.639671E-02	9.66967E+00	3.9727E+00	7.0730E+04	3.6340E-02	0.000E+00	2.672E+01
4.959809E-02	9.79279E+00	3.6535E+00	6.0848E+04	4.4087E-02	0.000E+00	2.500E+01
5.302035E-02	9.87310E+00	3.4244E+00	5.3352E+04	5.3233E-02	0.000E+00	2.338E+01
5.667876E-02	9.92252E+00	3.2483E+00	4.7341E+04	6.3978E-02	0.000E+00	2.187E+01
6.058959E-02	9.93366E+00	3.1077E+00	4.2369E+04	7.6537E-02	0.000E+00	2.046E+01
6.477028E-02	9.84482E+00	2.9948E+00	3.8195E+04	9.1139E-02	0.000E+00	1.914E+01
6.517000E-02	9.81827E+00	2.9856E+00	3.7844E+04	9.2597E-02	0.000E+00	1.902E+01
6.616750E-02	9.66616E+00	2.9639E+00	3.7002E+04	9.6282E-02	0.000E+00	1.874E+01
6.643350E-02	9.48206E+00	2.9583E+00	3.6784E+04	9.7275E-02	0.000E+00	1.866E+01
6.683250E-02	9.66842E+00	3.3136E+00	4.0957E+04	9.8774E-02	0.000E+00	1.855E+01
6.783000E-02	9.83442E+00	3.3006E+00	4.0195E+04	1.0257E-01	0.000E+00	1.828E+01
6.923942E-02	9.92865E+00	3.2845E+00	3.9185E+04	1.0803E-01	0.000E+00	1.791E+01
7.401695E-02	1.00868E+01	3.2481E+00	3.6250E+04	1.2748E-01	0.000E+00	1.675E+01
7.912411E-02	1.01956E+01	3.2329E+00	3.3751E+04	1.4975E-01	0.000E+00	1.567E+01
8.458368E-02	1.02928E+01	3.2361E+00	3.1604E+04	1.7513E-01	0.000E+00	1.466E+01
9.041995E-02	1.03896E+01	3.2560E+00	2.9746E+04	2.0390E-01	0.000E+00	1.371E+01
9.665893E-02	1.04924E+01	3.2903E+00	2.8119E+04	2.3636E-01	0.000E+00	1.283E+01
1.033284E-01	1.06054E+01	3.3358E+00	2.6668E+04	2.7278E-01	0.000E+00	1.200E+01
1.104581E-01	1.07319E+01	3.3885E+00	2.5340E+04	3.1347E-01	0.000E+00	1.122E+01
1.180797E-01	1.08633E+01	3.4437E+00	2.4091E+04	3.5867E-01	0.000E+00	1.050E+01
1.262272E-01	1.10204E+01	3.4966E+00	2.2882E+04	4.0865E-01	0.000E+00	9.822E+00
1.349368E-01	1.11921E+01	3.5423E+00	2.1685E+04	4.6362E-01	0.000E+00	9.188E+00
1.442475E-01	1.13764E+01	3.5763E+00	2.0480E+04	5.2379E-01	0.000E+00	8.595E+00
1.542005E-01	1.15703E+01	3.5945E+00	1.9256E+04	5.8931E-01	0.000E+00	8.040E+00
1.648404E-01	1.17692E+01	3.5910E+00	1.7995E+04	6.6030E-01	0.000E+00	7.521E+00
1.762144E-01	1.19653E+01	3.5633E+00	1.6704E+04	7.3680E-01	0.000E+00	7.036E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.883732E-01	1.21513E+01	3.5119E+00	1.5400E+04	8.1885E-01	0.000E+00	6.582E+00
2.013709E-01	1.23224E+01	3.4384E+00	1.4105E+04	9.0637E-01	0.000E+00	6.157E+00
2.152655E-01	1.24690E+01	3.3451E+00	1.2836E+04	9.9924E-01	0.000E+00	5.760E+00
2.301188E-01	1.25871E+01	3.2352E+00	1.1613E+04	1.0973E+00	0.000E+00	5.388E+00
2.459970E-01	1.26713E+01	3.1120E+00	1.0450E+04	1.2002E+00	0.000E+00	5.040E+00
2.629708E-01	1.27160E+01	2.9789E+00	9.3574E+03	1.3077E+00	0.000E+00	4.715E+00
2.811158E-01	1.27150E+01	2.8390E+00	8.3423E+03	1.4194E+00	0.000E+00	4.410E+00
3.005128E-01	1.26602E+01	2.6950E+00	7.4081E+03	1.5347E+00	0.000E+00	4.126E+00
3.212482E-01	1.25404E+01	2.5496E+00	6.5561E+03	1.6530E+00	0.000E+00	3.859E+00
3.434143E-01	1.23391E+01	2.4050E+00	5.7851E+03	1.7739E+00	0.000E+00	3.610E+00
3.671099E-01	1.20299E+01	2.2630E+00	5.0920E+03	1.8965E+00	0.000E+00	3.377E+00
3.924405E-01	1.15670E+01	2.1248E+00	4.4725E+03	2.0201E+00	0.000E+00	3.159E+00
4.195189E-01	1.08618E+01	1.9915E+00	3.9214E+03	2.1440E+00	0.000E+00	2.955E+00
4.484657E-01	9.71151E+00	1.8639E+00	3.4333E+03	2.2672E+00	0.000E+00	2.765E+00
4.794098E-01	7.46757E+00	1.7424E+00	3.0023E+03	2.3889E+00	0.000E+00	2.586E+00
5.026420E-01	3.15839E+00	1.6601E+00	2.7282E+03	2.4739E+00	0.000E+00	2.467E+00
5.100900E-01	-1.39635E+00	1.6351E+00	2.6480E+03	2.5000E+00	0.000E+00	2.431E+00
5.103355E-01	-1.70484E+00	1.6343E+00	2.6454E+03	2.5008E+00	0.000E+00	2.429E+00
5.124891E-01	-7.62793E+00	1.6273E+00	2.6229E+03	2.5083E+00	0.000E+00	2.419E+00
5.154645E-01	-2.50381E+00	1.1276E+01	1.8070E+04	2.5183E+00	0.000E+00	2.403E+00
5.178975E-01	-1.34166E+00	1.1206E+01	1.7874E+04	2.5268E+00	0.000E+00	2.394E+00
5.199795E-01	-2.63868E+00	1.1147E+01	1.7708E+04	2.5338E+00	0.000E+00	2.384E+00
5.231025E-01	1.09287E+00	1.5841E+01	2.5016E+04	2.5443E+00	0.000E+00	2.370E+00
5.231580E-01	1.14400E+00	1.5839E+01	2.5010E+04	2.5445E+00	0.000E+00	2.370E+00
5.309100E-01	5.20730E+00	1.5532E+01	2.4167E+04	2.5702E+00	0.000E+00	2.335E+00
5.478508E-01	9.04877E+00	1.4897E+01	2.2462E+04	2.6243E+00	0.000E+00	2.263E+00
5.856525E-01	1.28372E+01	1.3629E+01	1.9223E+04	2.7362E+00	0.000E+00	2.117E+00
6.156360E-01	1.40588E+01	1.2738E+01	1.7091E+04	2.8167E+00	0.000E+00	2.014E+00
6.250590E-01	1.37816E+01	1.2476E+01	1.6487E+04	2.8406E+00	0.000E+00	1.984E+00
6.260625E-01	1.36222E+01	1.2448E+01	1.6424E+04	2.8431E+00	0.000E+00	1.980E+00
6.275718E-01	1.30350E+01	1.2407E+01	1.6331E+04	2.8469E+00	0.000E+00	1.976E+00
6.313410E-01	1.40717E+01	1.3990E+01	1.8304E+04	2.8562E+00	0.000E+00	1.964E+00
6.407640E-01	1.52143E+01	1.3733E+01	1.7704E+04	2.8790E+00	0.000E+00	1.935E+00
6.692609E-01	1.68550E+01	1.3000E+01	1.6045E+04	2.9441E+00	0.000E+00	1.853E+00
7.154399E-01	1.84554E+01	1.1939E+01	1.3784E+04	3.0384E+00	0.000E+00	1.733E+00
7.648052E-01	1.95960E+01	1.0937E+01	1.1812E+04	3.1253E+00	0.000E+00	1.621E+00
8.175768E-01	2.04566E+01	1.0006E+01	1.0110E+04	3.2040E+00	0.000E+00	1.516E+00
8.739896E-01	2.11301E+01	9.1452E+00	8.6436E+03	3.2740E+00	0.000E+00	1.419E+00
9.342948E-01	2.16581E+01	8.3284E+00	7.3635E+03	3.3348E+00	0.000E+00	1.327E+00
9.987612E-01	2.20899E+01	7.5803E+00	6.2695E+03	3.3858E+00	0.000E+00	1.241E+00
1.067676E+00	2.24125E+01	6.8343E+00	5.2877E+03	3.4268E+00	0.000E+00	1.161E+00
1.141345E+00	2.26235E+01	6.1482E+00	4.4498E+03	3.4574E+00	0.000E+00	1.086E+00
1.220098E+00	2.27603E+01	5.5300E+00	3.7440E+03	3.4776E+00	0.000E+00	1.016E+00
1.304285E+00	2.28438E+01	4.9725E+00	3.1493E+03	3.4872E+00	0.000E+00	9.506E-01
1.394281E+00	2.28869E+01	4.4710E+00	2.6489E+03	3.4863E+00	0.000E+00	8.892E-01
1.490486E+00	2.28996E+01	4.0207E+00	2.2283E+03	3.4750E+00	0.000E+00	8.318E-01
1.593329E+00	2.28934E+01	3.6167E+00	1.8751E+03	3.4537E+00	0.000E+00	7.781E-01
1.703269E+00	2.28669E+01	3.2545E+00	1.5784E+03	3.4225E+00	0.000E+00	7.279E-01
1.820795E+00	2.28285E+01	2.9300E+00	1.3293E+03	3.3819E+00	0.000E+00	6.809E-01
1.946430E+00	2.27819E+01	2.6393E+00	1.1201E+03	3.3324E+00	0.000E+00	6.370E-01
2.080733E+00	2.27317E+01	2.3764E+00	9.4343E+02	3.2745E+00	0.000E+00	5.959E-01
2.224304E+00	2.26720E+01	2.1275E+00	7.9009E+02	3.2088E+00	0.000E+00	5.574E-01
2.377781E+00	2.26035E+01	1.9068E+00	6.6245E+02	3.1360E+00	0.000E+00	5.214E-01
2.541848E+00	2.25308E+01	1.7099E+00	5.5567E+02	3.0567E+00	0.000E+00	4.878E-01
2.717235E+00	2.24528E+01	1.5291E+00	4.6485E+02	2.9716E+00	0.000E+00	4.563E-01
2.904724E+00	2.23715E+01	1.3687E+00	3.8923E+02	2.8815E+00	0.000E+00	4.268E-01
3.105150E+00	2.22923E+01	1.2150E+00	3.2323E+02	2.7871E+00	0.000E+00	3.993E-01
3.319406E+00	2.21901E+01	1.0704E+00	2.6638E+02	2.6892E+00	0.000E+00	3.735E-01
3.548445E+00	2.20721E+01	9.4397E-01	2.1975E+02	2.5884E+00	0.000E+00	3.494E-01
3.793288E+00	2.19364E+01	8.3331E-01	1.8147E+02	2.4856E+00	0.000E+00	3.269E-01
4.055024E+00	2.17762E+01	7.3636E-01	1.5001E+02	2.3813E+00	0.000E+00	3.058E-01
4.334821E+00	2.15764E+01	6.5136E-01	1.2412E+02	2.2763E+00	0.000E+00	2.860E-01
4.633924E+00	2.13044E+01	5.7675E-01	1.0281E+02	2.1711E+00	0.000E+00	2.676E-01
4.953664E+00	2.08694E+01	5.1121E-01	8.5246E+01	2.0664E+00	0.000E+00	2.503E-01
5.295467E+00	1.98136E+01	4.5356E-01	7.0752E+01	1.9627E+00	0.000E+00	2.341E-01

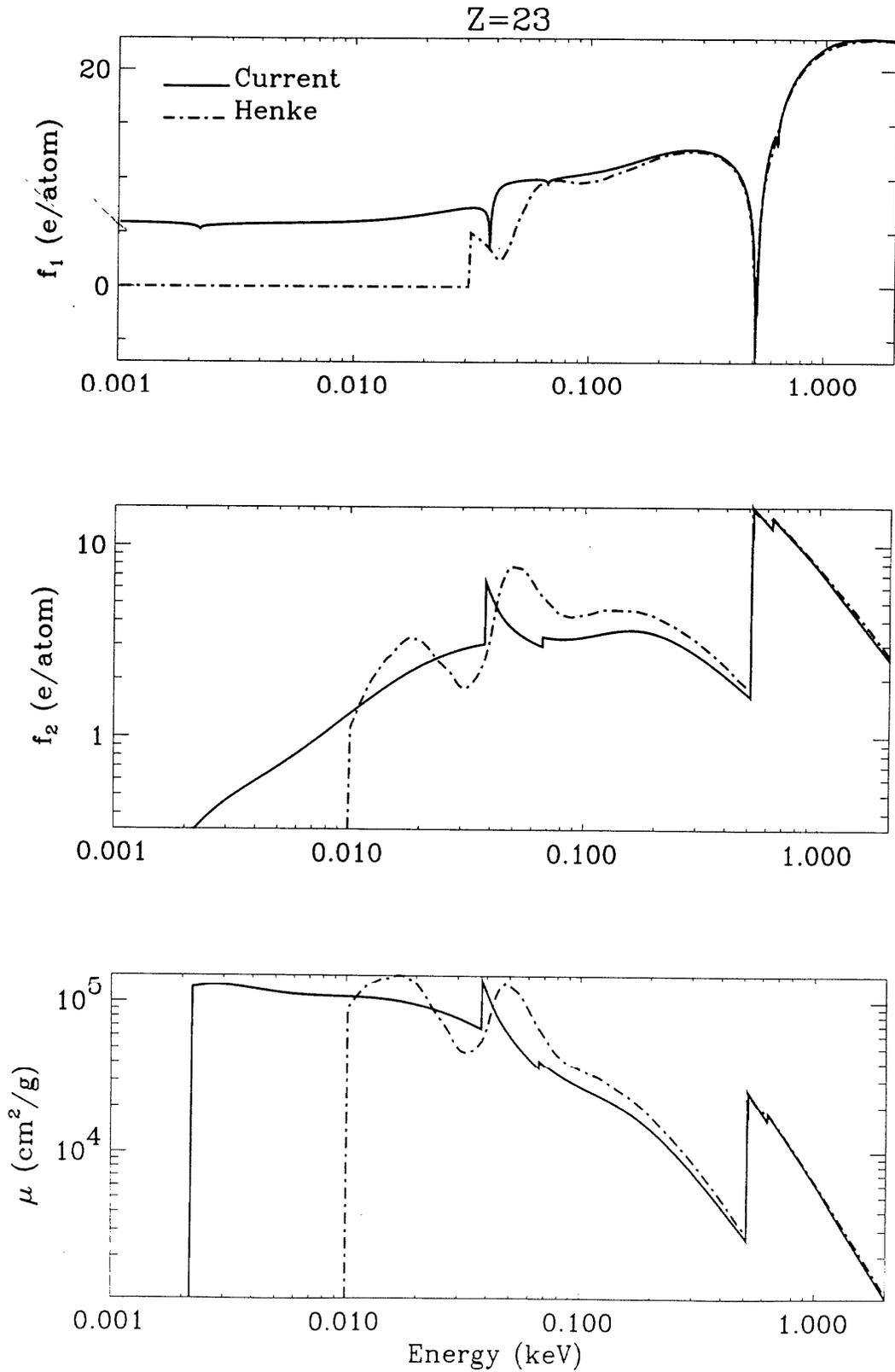
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 205

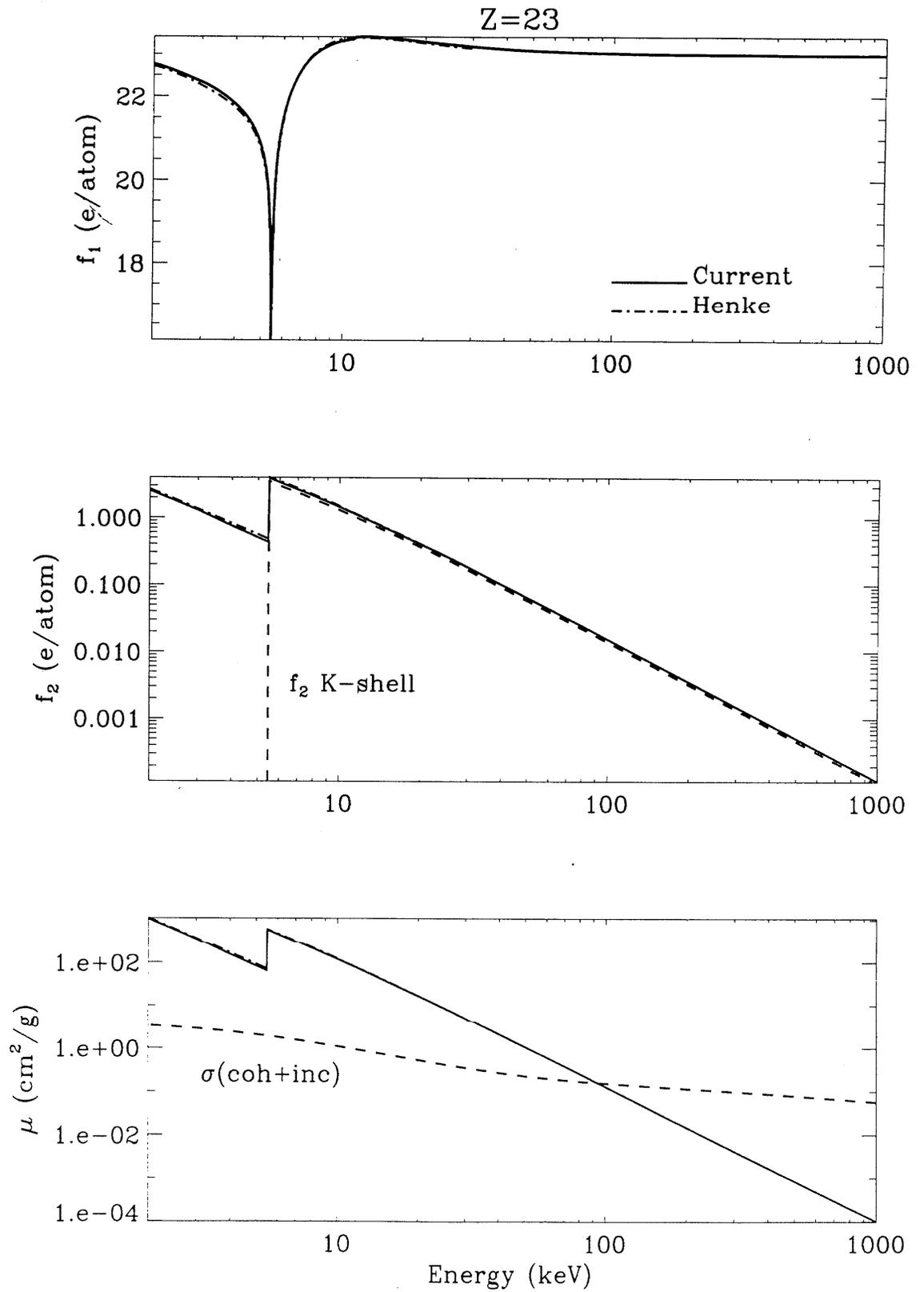
TABLE 1: Form factors, attenuation and scattering cross-sections, Z=1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
5.355798E+00	1.93670E+01	4.4449E-01	6.8556E+01	1.9452E+00	0.000E+00	2.315E-01
5.437774E+00	1.78916E+01	4.3262E-01	6.5720E+01	1.9218E+00	0.000E+00	2.280E-01
5.459635E+00	1.61109E+01	4.2954E-01	6.4991E+01	1.9157E+00	0.000E+00	2.271E-01
5.492425E+00	1.79281E+01	3.9371E+00	5.9213E+02	1.9065E+00	5.282E+02	2.257E-01
5.574402E+00	1.95732E+01	3.8274E+00	5.6717E+02	1.8839E+00	5.058E+02	2.224E-01
5.660855E+00	2.02817E+01	3.7167E+00	5.4235E+02	1.8604E+00	4.836E+02	2.190E-01
6.051453E+00	2.15912E+01	3.3154E+00	4.5257E+02	1.7602E+00	4.037E+02	2.049E-01
6.469004E+00	2.21944E+01	2.9844E+00	3.8109E+02	1.6622E+00	3.404E+02	1.917E-01
6.915365E+00	2.25734E+01	2.6931E+00	3.2170E+02	1.5670E+00	2.878E+02	1.793E-01
7.392525E+00	2.28396E+01	2.4213E+00	2.7056E+02	1.4747E+00	2.423E+02	1.677E-01
7.902609E+00	2.30228E+01	2.1691E+00	2.2673E+02	1.3857E+00	2.031E+02	1.569E-01
8.447890E+00	2.31513E+01	1.9414E+00	1.8984E+02	1.3001E+00	1.701E+02	1.468E-01
9.030794E+00	2.32454E+01	1.7355E+00	1.5875E+02	1.2181E+00	1.423E+02	1.373E-01
9.653919E+00	2.33090E+01	1.5457E+00	1.3226E+02	1.1399E+00	1.187E+02	1.284E-01
1.032004E+01	2.33493E+01	1.3765E+00	1.1018E+02	1.0654E+00	9.903E+01	1.201E-01
1.103212E+01	2.34148E+01	1.2246E+00	9.1698E+01	9.9485E-01	8.251E+01	1.124E-01
1.179334E+01	2.34254E+01	1.0823E+00	7.5812E+01	9.2813E-01	6.824E+01	1.051E-01
1.260708E+01	2.34240E+01	9.5604E-01	6.2642E+01	8.6524E-01	5.643E+01	9.834E-02
1.347697E+01	2.34149E+01	8.4453E-01	5.1764E+01	8.0615E-01	4.667E+01	9.200E-02
1.440688E+01	2.34008E+01	7.4607E-01	4.2778E+01	7.5077E-01	3.860E+01	8.606E-02
1.540095E+01	2.33833E+01	6.5914E-01	3.5354E+01	6.9901E-01	3.192E+01	8.050E-02
1.646362E+01	2.33639E+01	5.8237E-01	2.9220E+01	6.5077E-01	2.640E+01	7.531E-02
1.759961E+01	2.33434E+01	5.1457E-01	2.4152E+01	6.0591E-01	2.183E+01	7.045E-02
1.881398E+01	2.33225E+01	4.5469E-01	1.9964E+01	5.6430E-01	1.805E+01	6.590E-02
2.011215E+01	2.33018E+01	4.0180E-01	1.6503E+01	5.2579E-01	1.493E+01	6.165E-02
2.149988E+01	2.32816E+01	3.5508E-01	1.3643E+01	4.9023E-01	1.235E+01	5.767E-02
2.298338E+01	2.32624E+01	3.1380E-01	1.1279E+01	4.5746E-01	1.021E+01	5.395E-02
2.456923E+01	2.32443E+01	2.7646E-01	9.2949E+00	4.2733E-01	8.415E+00	5.046E-02
2.626450E+01	2.32271E+01	2.4293E-01	7.6406E+00	3.9966E-01	6.915E+00	4.721E-02
2.807676E+01	2.32099E+01	2.1236E-01	6.2480E+00	3.7430E-01	5.655E+00	4.416E-02
3.001405E+01	2.31928E+01	1.8533E-01	5.1006E+00	3.5110E-01	4.617E+00	4.131E-02
3.208502E+01	2.31764E+01	1.6172E-01	4.1637E+00	3.2989E-01	3.770E+00	3.864E-02
3.429889E+01	2.31610E+01	1.4113E-01	3.3990E+00	3.1053E-01	3.078E+00	3.615E-02
3.666551E+01	2.31466E+01	1.2316E-01	2.7748E+00	2.9287E-01	2.513E+00	3.381E-02
3.919543E+01	2.31332E+01	1.0749E-01	2.2653E+00	2.7678E-01	2.052E+00	3.163E-02
4.189992E+01	2.31208E+01	9.3808E-02	1.8494E+00	2.6212E-01	1.675E+00	2.959E-02
4.479101E+01	2.31094E+01	8.1873E-02	1.5099E+00	2.4876E-01	1.368E+00	2.768E-02
4.788159E+01	2.30989E+01	7.1458E-02	1.2328E+00	2.3660E-01	1.117E+00	2.589E-02
5.118542E+01	2.30894E+01	6.2370E-02	1.0065E+00	2.2551E-01	9.119E-01	2.422E-02
5.471721E+01	2.30806E+01	5.4438E-02	8.2184E-01	2.1540E-01	7.446E-01	2.266E-02
5.849270E+01	2.30727E+01	4.7517E-02	6.7105E-01	2.0617E-01	6.079E-01	2.120E-02
6.252870E+01	2.30654E+01	4.1476E-02	5.4793E-01	1.9772E-01	4.964E-01	1.983E-02
6.684318E+01	2.30589E+01	3.6204E-02	4.4742E-01	1.8999E-01	4.053E-01	1.855E-02
7.145536E+01	2.30530E+01	3.1603E-02	3.6535E-01	1.8288E-01	3.309E-01	1.735E-02
7.638578E+01	2.30476E+01	2.7587E-02	2.9834E-01	1.7633E-01	2.702E-01	1.623E-02
8.165640E+01	2.30431E+01	2.4042E-02	2.4321E-01	1.7029E-01	2.202E-01	1.518E-02
8.729069E+01	2.30386E+01	2.0874E-02	1.9753E-01	1.6468E-01	1.789E-01	1.420E-02
9.331374E+01	2.30346E+01	1.8123E-02	1.6043E-01	1.5946E-01	1.453E-01	1.329E-02
9.975239E+01	2.30310E+01	1.5735E-02	1.3030E-01	1.5459E-01	1.180E-01	1.243E-02
1.066353E+02	2.30277E+01	1.3662E-02	1.0583E-01	1.5001E-01	9.584E-02	1.163E-02
1.139931E+02	2.30247E+01	1.1862E-02	8.5960E-02	1.4570E-01	7.784E-02	1.088E-02
1.218587E+02	2.30221E+01	1.0300E-02	6.9820E-02	1.4163E-01	6.322E-02	1.017E-02
1.302669E+02	2.30197E+01	8.9431E-03	5.6710E-02	1.3775E-01	5.135E-02	9.518E-03
1.392553E+02	2.30176E+01	7.7653E-03	4.6063E-02	1.3405E-01	4.171E-02	8.903E-03
1.488640E+02	2.30157E+01	6.7426E-03	3.7415E-02	1.3050E-01	3.387E-02	8.329E-03
1.591356E+02	2.30140E+01	5.8547E-03	3.0391E-02	1.2709E-01	2.751E-02	7.791E-03
1.701159E+02	2.30124E+01	5.0838E-03	2.4686E-02	1.2379E-01	2.234E-02	7.288E-03
1.818539E+02	2.30111E+01	4.4144E-03	2.0052E-02	1.2059E-01	1.815E-02	6.818E-03
1.944018E+02	2.30099E+01	3.8332E-03	1.6288E-02	1.1749E-01	1.474E-02	6.378E-03
2.078156E+02	2.30088E+01	3.3286E-03	1.3231E-02	1.1446E-01	1.197E-02	5.966E-03
2.221548E+02	2.30078E+01	2.8904E-03	1.0747E-02	1.1151E-01	9.723E-03	5.581E-03
2.374835E+02	2.30069E+01	2.5099E-03	8.7303E-03	1.0862E-01	7.897E-03	5.221E-03
2.538699E+02	2.30062E+01	2.1795E-03	7.0918E-03	1.0578E-01	6.414E-03	4.884E-03
2.713869E+02	2.30055E+01	1.8926E-03	5.7609E-03	1.0300E-01	5.210E-03	4.569E-03
2.901126E+02	2.30049E+01	1.6435E-03	4.6797E-03	1.0027E-01	4.231E-03	4.274E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
3.101304E+02	2.30043E+01	1.4272E-03	3.8015E-03	9.7579E-02	3.437E-03	3.998E-03
3.315294E+02	2.30038E+01	1.2394E-03	3.0881E-03	9.4935E-02	2.791E-03	3.740E-03
3.544049E+02	2.30034E+01	1.0763E-03	2.5087E-03	9.2333E-02	2.267E-03	3.498E-03
3.788588E+02	2.30030E+01	9.3467E-04	2.0379E-03	8.9772E-02	1.841E-03	3.273E-03
4.050001E+02	2.30027E+01	8.1168E-04	1.6555E-03	8.7251E-02	1.495E-03	3.061E-03
4.329451E+02	2.30024E+01	7.0488E-04	1.3449E-03	8.4770E-02	1.215E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 209

Cr Z = 24

atomic weight = 5.199600E+01 g/mol, nominal density ρ (g/cm³) = 7.1800E+00

$\mu_{\text{t}}(\text{barns/atom}) = \mu(\text{cm}^2/\text{g}) \times 8.63414\text{E}+01$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 8.09299\text{E}+05$

edges. Edge energies (keV):

K		5.98920E+00	L	I	6.94600E-00	L	II	5.83700E-00	L	III	5.74500E-01
M	I	7.41000E-02	M	II	4.25000E-02	M	III	4.25000E-02	M	IV	2.30000E-03
M	V	2.30000E-03									

Relativistic correction estimate $f_{\text{rel}}(\text{H82,3/5CL}) = -8.9603\text{E}-02, -5.5800\text{E}-02$ e/atom

Nuclear Thomson correction $f_{\text{NT}} = -6.0770\text{E}-03$ e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	4.91074E+00	2.0464E+00	1.5492E+05	1.4845E-04	0.000E+00	1.160E+02
1.142761E-02	4.96917E+00	2.1522E+00	1.5242E+05	2.0198E-04	0.000E+00	1.085E+02
1.221612E-02	5.03413E+00	2.2639E+00	1.4998E+05	2.7332E-04	0.000E+00	1.015E+02
1.305903E-02	5.10636E+00	2.3810E+00	1.4755E+05	3.6783E-04	0.000E+00	9.494E+01
1.396010E-02	5.18659E+00	2.5029E+00	1.4510E+05	4.9234E-04	0.000E+00	8.881E+01
1.492335E-02	5.27545E+00	2.6290E+00	1.4257E+05	6.5545E-04	0.000E+00	8.308E+01
1.595306E-02	5.37345E+00	2.7586E+00	1.3994E+05	8.6793E-04	0.000E+00	7.772E+01
1.705382E-02	5.48100E+00	2.8907E+00	1.3718E+05	1.1432E-03	0.000E+00	7.270E+01
1.823053E-02	5.59831E+00	3.0245E+00	1.3427E+05	1.4978E-03	0.000E+00	6.801E+01
1.948844E-02	5.72538E+00	3.1589E+00	1.3118E+05	1.9521E-03	0.000E+00	6.362E+01
2.083314E-02	5.86196E+00	3.2927E+00	1.2791E+05	2.5310E-03	0.000E+00	5.951E+01
2.227063E-02	6.00743E+00	3.4249E+00	1.2446E+05	3.2645E-03	0.000E+00	5.567E+01
2.380730E-02	6.16072E+00	3.5542E+00	1.2082E+05	4.1889E-03	0.000E+00	5.208E+01
2.545001E-02	6.32013E+00	3.6795E+00	1.1701E+05	5.3477E-03	0.000E+00	4.872E+01
2.720606E-02	6.48301E+00	3.7997E+00	1.1303E+05	6.7923E-03	0.000E+00	4.557E+01
2.908327E-02	6.64508E+00	3.9138E+00	1.0891E+05	8.5838E-03	0.000E+00	4.263E+01
3.109002E-02	6.79915E+00	4.0208E+00	1.0466E+05	1.0793E-02	0.000E+00	3.988E+01
3.323523E-02	6.93175E+00	4.1198E+00	1.0032E+05	1.3504E-02	0.000E+00	3.731E+01
3.552846E-02	7.01362E+00	4.2103E+00	9.5907E+04	1.6813E-02	0.000E+00	3.490E+01
3.797993E-02	6.96365E+00	4.2917E+00	9.1450E+04	2.0829E-02	0.000E+00	3.264E+01
4.060054E-02	6.40477E+00	4.3636E+00	8.6981E+04	2.5679E-02	0.000E+00	3.054E+01
4.165000E-02	5.50583E+00	4.3886E+00	8.5274E+04	2.7784E-02	0.000E+00	2.977E+01
4.228750E-02	3.43782E+00	4.4027E+00	8.4260E+04	2.9108E-02	0.000E+00	2.932E+01
4.245750E-02	6.22173E-01	4.4064E+00	8.3992E+04	2.9467E-02	0.000E+00	2.920E+01
4.271250E-02	4.05524E+00	1.0114E+01	1.9164E+05	3.0009E-02	0.000E+00	2.903E+01
4.335000E-02	7.09375E+00	9.4318E+00	1.7608E+05	3.1391E-02	0.000E+00	2.860E+01
4.340198E-02	7.22680E+00	9.3778E+00	1.7486E+05	3.1505E-02	0.000E+00	2.857E+01
4.639671E-02	1.00687E+01	7.0694E+00	1.2331E+05	3.8467E-02	0.000E+00	2.672E+01
4.959809E-02	1.05444E+01	5.8022E+00	9.4676E+04	4.6745E-02	0.000E+00	2.500E+01
5.302035E-02	1.06760E+01	5.1298E+00	7.8301E+04	5.6534E-02	0.000E+00	2.338E+01
5.667876E-02	1.07528E+01	4.7082E+00	6.7227E+04	6.8052E-02	0.000E+00	2.187E+01
6.058959E-02	1.08150E+01	4.4061E+00	5.8853E+04	8.1535E-02	0.000E+00	2.046E+01
6.477028E-02	1.08599E+01	4.1693E+00	5.2095E+04	9.7236E-02	0.000E+00	1.914E+01
6.923942E-02	1.08662E+01	3.9739E+00	4.6448E+04	1.1543E-01	0.000E+00	1.791E+01
7.261800E-02	1.07857E+01	3.8536E+00	4.2946E+04	1.3010E-01	0.000E+00	1.707E+01
7.372950E-02	1.06519E+01	3.8182E+00	4.1910E+04	1.3509E-01	0.000E+00	1.682E+01
7.401695E-02	1.04986E+01	3.8093E+00	4.1651E+04	1.3640E-01	0.000E+00	1.675E+01
7.402590E-02	1.04869E+01	3.8090E+00	4.1643E+04	1.3644E-01	0.000E+00	1.675E+01
7.447050E-02	1.06552E+01	4.1232E+00	4.4808E+04	1.3847E-01	0.000E+00	1.665E+01
7.558200E-02	1.08074E+01	4.0982E+00	4.3882E+04	1.4359E-01	0.000E+00	1.640E+01
7.912411E-02	1.09676E+01	4.0301E+00	4.1220E+04	1.6045E-01	0.000E+00	1.567E+01
8.458368E-02	1.11006E+01	3.9538E+00	3.7830E+04	1.8789E-01	0.000E+00	1.466E+01
9.041995E-02	1.12096E+01	3.8999E+00	3.4906E+04	2.1904E-01	0.000E+00	1.371E+01
9.665893E-02	1.13121E+01	3.8667E+00	3.2374E+04	2.5423E-01	0.000E+00	1.283E+01
1.033284E-01	1.14160E+01	3.8526E+00	3.0175E+04	2.9378E-01	0.000E+00	1.200E+01
1.104581E-01	1.15266E+01	3.8554E+00	2.8248E+04	3.3800E-01	0.000E+00	1.122E+01
1.180797E-01	1.16482E+01	3.8716E+00	2.6536E+04	3.8719E-01	0.000E+00	1.050E+01
1.262272E-01	1.17840E+01	3.8970E+00	2.4985E+04	4.4165E-01	0.000E+00	9.822E+00
1.349368E-01	1.19285E+01	3.9264E+00	2.3549E+04	5.0161E-01	0.000E+00	9.188E+00
1.442475E-01	1.20966E+01	3.9543E+00	2.2185E+04	5.6731E-01	0.000E+00	8.595E+00
1.542005E-01	1.22801E+01	3.9752E+00	2.0863E+04	6.3893E-01	0.000E+00	8.040E+00
1.648404E-01	1.24764E+01	3.9841E+00	1.9560E+04	7.1660E-01	0.000E+00	7.521E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.762144E-01	1.26825E+01	3.9761E+00	1.8261E+04	8.0041E-01	0.000E+00	7.036E+00
1.883732E-01	1.28920E+01	3.9445E+00	1.6947E+04	8.9037E-01	0.000E+00	6.582E+00
2.013709E-01	1.30964E+01	3.8880E+00	1.5626E+04	9.8642E-01	0.000E+00	6.157E+00
2.152655E-01	1.32879E+01	3.8071E+00	1.4313E+04	1.0884E+00	0.000E+00	5.760E+00
2.301188E-01	1.34608E+01	3.7041E+00	1.3027E+04	1.1962E+00	0.000E+00	5.388E+00
2.459970E-01	1.36061E+01	3.5818E+00	1.1784E+04	1.3095E+00	0.000E+00	5.040E+00
2.629708E-01	1.37191E+01	3.4440E+00	1.0599E+04	1.4279E+00	0.000E+00	4.715E+00
2.811158E-01	1.37945E+01	3.2943E+00	9.4839E+03	1.5510E+00	0.000E+00	4.410E+00
3.005128E-01	1.38264E+01	3.1366E+00	8.4469E+03	1.6782E+00	0.000E+00	4.126E+00
3.212482E-01	1.38083E+01	2.9740E+00	7.4922E+03	1.8089E+00	0.000E+00	3.859E+00
3.434143E-01	1.37312E+01	2.8096E+00	6.6212E+03	1.9425E+00	0.000E+00	3.610E+00
3.671099E-01	1.35829E+01	2.6461E+00	5.8333E+03	2.0781E+00	0.000E+00	3.377E+00
3.924405E-01	1.33444E+01	2.4855E+00	5.1257E+03	2.2149E+00	0.000E+00	3.159E+00
4.195189E-01	1.29845E+01	2.3296E+00	4.4940E+03	2.3520E+00	0.000E+00	2.955E+00
4.484657E-01	1.24471E+01	2.1795E+00	3.9330E+03	2.4886E+00	0.000E+00	2.765E+00
4.794098E-01	1.16190E+01	2.0360E+00	3.4370E+03	2.6236E+00	0.000E+00	2.586E+00
5.124891E-01	1.02203E+01	1.8997E+00	3.0000E+03	2.7561E+00	0.000E+00	2.419E+00
5.478508E-01	7.17813E+00	1.7709E+00	2.6160E+03	2.8850E+00	0.000E+00	2.263E+00
5.630100E-01	4.03264E+00	1.7204E+00	2.4729E+03	2.9365E+00	0.000E+00	2.202E+00
5.720260E-01	-1.46698E+00	1.6915E+00	2.3932E+03	2.9661E+00	0.000E+00	2.167E+00
5.739255E-01	-6.34058E+00	1.6856E+00	2.3768E+03	2.9722E+00	0.000E+00	2.160E+00
5.773725E-01	-1.66698E+00	1.1688E+01	1.6383E+04	2.9833E+00	0.000E+00	2.147E+00
5.807815E-01	-2.33901E-01	1.1587E+01	1.6146E+04	2.9941E+00	0.000E+00	2.135E+00
5.831163E-01	-1.67326E+00	1.1518E+01	1.5986E+04	3.0015E+00	0.000E+00	2.126E+00
5.856525E-01	1.18309E+00	1.6406E+01	2.2671E+04	3.0094E+00	0.000E+00	2.117E+00
5.859900E-01	1.54437E+00	1.6392E+01	2.2638E+04	3.0104E+00	0.000E+00	2.116E+00
5.866185E-01	2.12272E+00	1.6365E+01	2.2578E+04	3.0124E+00	0.000E+00	2.114E+00
5.953740E-01	6.31539E+00	1.6009E+01	2.1761E+04	3.0393E+00	0.000E+00	2.082E+00
6.260625E-01	1.16720E+01	1.4855E+01	1.9203E+04	3.1283E+00	0.000E+00	1.980E+00
6.692609E-01	1.45819E+01	1.3462E+01	1.6279E+04	3.2407E+00	0.000E+00	1.853E+00
6.807080E-01	1.48744E+01	1.3133E+01	1.5614E+04	3.2682E+00	0.000E+00	1.821E+00
6.911270E-01	1.46210E+01	1.2846E+01	1.5043E+04	3.2923E+00	0.000E+00	1.794E+00
6.939054E-01	1.38694E+01	1.2771E+01	1.4895E+04	3.2986E+00	0.000E+00	1.787E+00
6.980730E-01	1.49312E+01	1.4371E+01	1.6661E+04	3.3080E+00	0.000E+00	1.776E+00
7.084920E-01	1.61104E+01	1.4093E+01	1.6099E+04	3.3309E+00	0.000E+00	1.750E+00
7.154399E-01	1.65908E+01	1.3914E+01	1.5739E+04	3.3458E+00	0.000E+00	1.733E+00
7.648052E-01	1.87137E+01	1.2748E+01	1.3490E+04	3.4427E+00	0.000E+00	1.621E+00
8.175768E-01	2.00955E+01	1.1672E+01	1.1554E+04	3.5306E+00	0.000E+00	1.516E+00
8.739896E-01	2.11147E+01	1.0670E+01	9.8800E+03	3.6089E+00	0.000E+00	1.419E+00
9.342948E-01	2.19000E+01	9.7452E+00	8.4414E+03	3.6770E+00	0.000E+00	1.327E+00
9.987612E-01	2.25466E+01	8.8912E+00	7.2046E+03	3.7342E+00	0.000E+00	1.241E+00
1.067676E+00	2.30148E+01	8.0226E+00	6.0811E+03	3.7803E+00	0.000E+00	1.161E+00
1.141345E+00	2.33470E+01	7.2353E+00	5.1303E+03	3.8150E+00	0.000E+00	1.086E+00
1.220098E+00	2.35870E+01	6.5161E+00	4.3221E+03	3.8380E+00	0.000E+00	1.016E+00
1.304285E+00	2.37474E+01	5.8615E+00	3.6370E+03	3.8493E+00	0.000E+00	9.506E-01
1.394281E+00	2.38492E+01	5.2721E+00	3.0602E+03	3.8489E+00	0.000E+00	8.892E-01
1.490486E+00	2.39066E+01	4.7405E+00	2.5740E+03	3.8370E+00	0.000E+00	8.318E-01
1.593329E+00	2.39301E+01	4.2630E+00	2.1653E+03	3.8139E+00	0.000E+00	7.781E-01
1.703269E+00	2.39280E+01	3.8344E+00	1.8219E+03	3.7798E+00	0.000E+00	7.279E-01
1.820795E+00	2.39099E+01	3.4502E+00	1.5335E+03	3.7353E+00	0.000E+00	6.809E-01
1.946430E+00	2.38752E+01	3.1057E+00	1.2913E+03	3.6808E+00	0.000E+00	6.370E-01
2.080733E+00	2.38307E+01	2.7971E+00	1.0879E+03	3.6169E+00	0.000E+00	5.959E-01
2.224304E+00	2.37813E+01	2.5207E+00	9.1714E+02	3.5444E+00	0.000E+00	5.574E-01
2.377781E+00	2.37276E+01	2.2658E+00	7.7117E+02	3.4639E+00	0.000E+00	5.214E-01
2.541848E+00	2.36639E+01	2.0299E+00	6.4631E+02	3.3762E+00	0.000E+00	4.878E-01
2.717235E+00	2.35939E+01	1.8208E+00	5.4230E+02	3.2820E+00	0.000E+00	4.563E-01
2.904724E+00	2.35212E+01	1.6307E+00	4.5435E+02	3.1822E+00	0.000E+00	4.268E-01
3.105150E+00	2.34551E+01	1.4474E+00	3.7725E+02	3.0777E+00	0.000E+00	3.993E-01
3.319406E+00	2.33672E+01	1.2756E+00	3.1101E+02	2.9691E+00	0.000E+00	3.735E-01
3.548445E+00	2.32625E+01	1.1254E+00	2.5667E+02	2.8575E+00	0.000E+00	3.494E-01
3.793288E+00	2.31453E+01	9.9380E-01	2.1203E+02	2.7434E+00	0.000E+00	3.269E-01
4.055024E+00	2.30137E+01	8.7851E-01	1.7533E+02	2.6278E+00	0.000E+00	3.058E-01
4.334821E+00	2.28622E+01	7.7738E-01	1.4514E+02	2.5113E+00	0.000E+00	2.860E-01
4.633924E+00	2.26790E+01	6.8860E-01	1.2026E+02	2.3946E+00	0.000E+00	2.676E-01
4.953664E+00	2.24400E+01	6.1057E-01	9.9752E+01	2.2784E+00	0.000E+00	2.503E-01

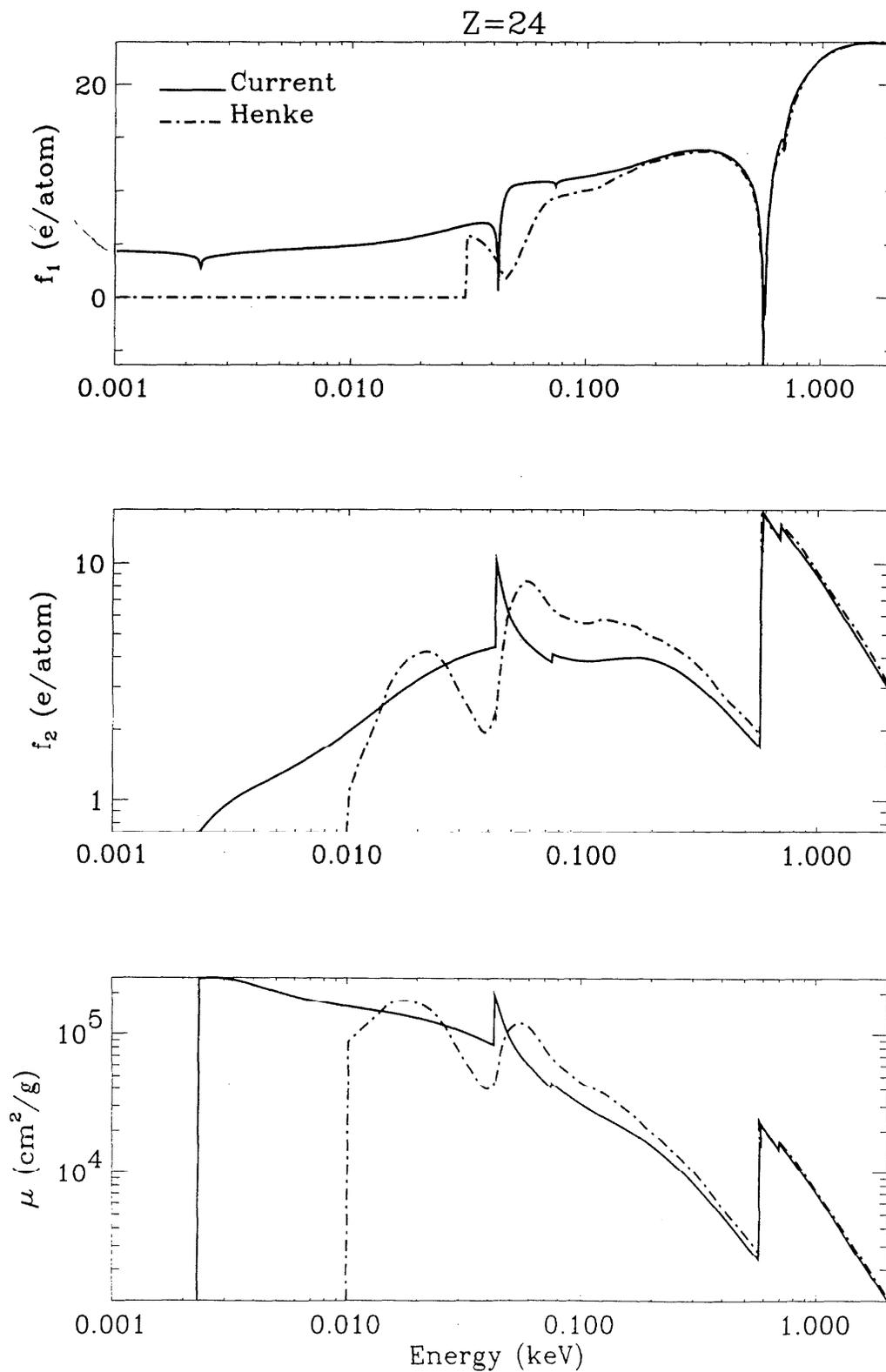
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 211

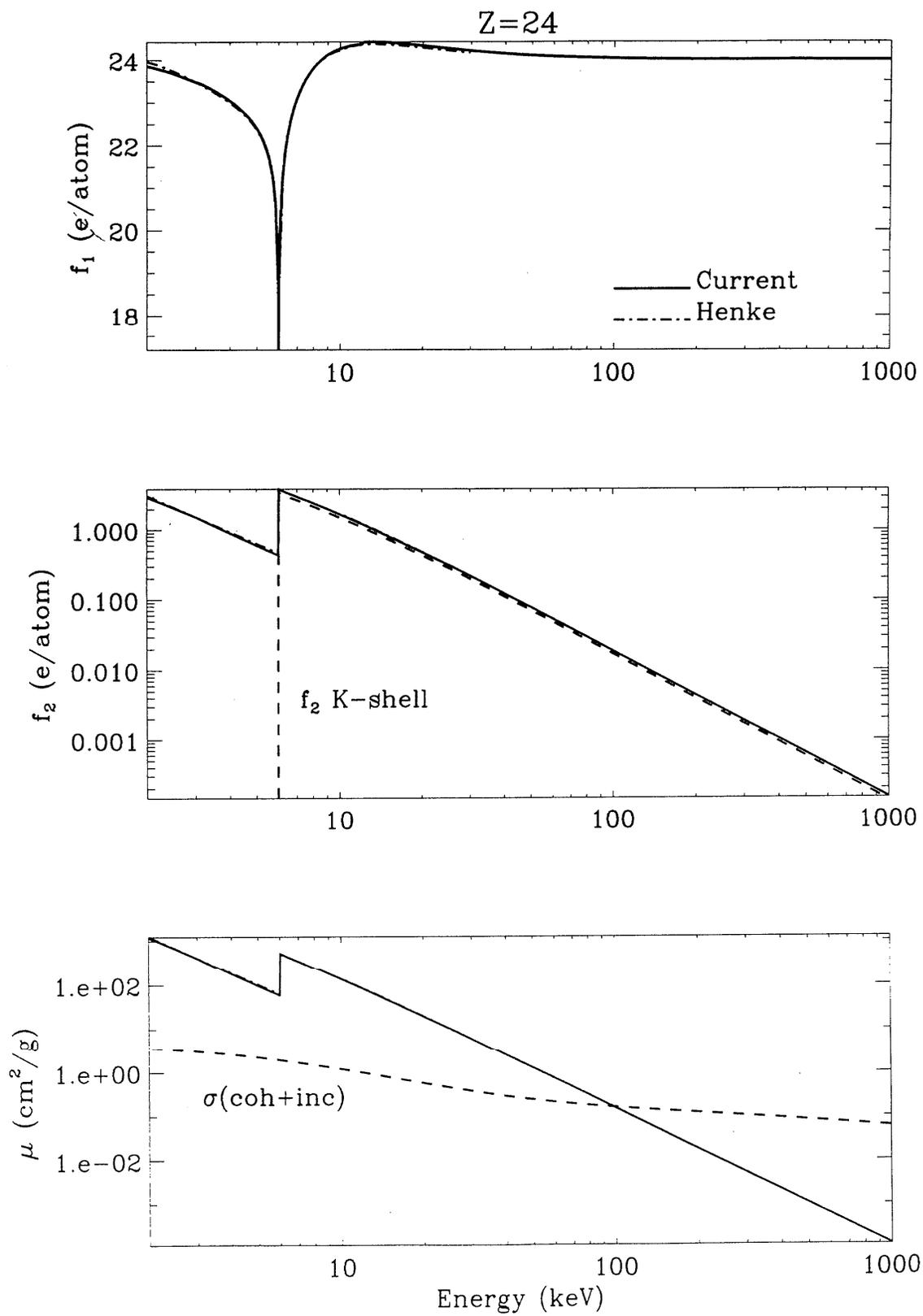
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
5.295467E+00	2.20858E+01	5.4194E-01	8.2824E+01	2.1633E+00	0.000E+00	2.341E-01
5.660855E+00	2.13981E+01	4.8151E-01	6.8838E+01	2.0499E+00	0.000E+00	2.190E-01
5.869416E+00	2.04015E+01	4.5180E-01	6.2295E+01	1.9892E+00	0.000E+00	2.112E-01
5.959254E+00	1.89371E+01	4.3991E-01	5.9743E+01	1.9640E+00	0.000E+00	2.081E-01
5.983211E+00	1.71703E+01	4.3683E-01	5.9086E+01	1.9573E+00	0.000E+00	2.072E-01
6.019146E+00	1.89719E+01	3.9165E+00	5.2658E+02	1.9474E+00	4.685E+02	2.060E-01
6.051453E+00	1.98252E+01	3.8773E+00	5.1854E+02	1.9386E+00	4.613E+02	2.049E-01
6.108984E+00	2.06031E+01	3.8091E+00	5.0462E+02	1.9230E+00	4.488E+02	2.030E-01
6.469004E+00	2.22661E+01	3.4413E+00	4.3052E+02	1.8299E+00	3.828E+02	1.917E-01
6.915365E+00	2.30221E+01	3.0935E+00	3.6203E+02	1.7242E+00	3.223E+02	1.793E-01
7.392525E+00	2.34637E+01	2.7898E+00	3.0541E+02	1.6218E+00	2.722E+02	1.677E-01
7.902609E+00	2.37651E+01	2.5128E+00	2.5733E+02	1.5230E+00	2.296E+02	1.569E-01
8.447890E+00	2.39746E+01	2.2524E+00	2.1578E+02	1.4280E+00	1.926E+02	1.468E-01
9.030794E+00	2.41269E+01	2.0153E+00	1.8061E+02	1.3371E+00	1.613E+02	1.373E-01
9.653919E+00	2.42270E+01	1.7961E+00	1.5057E+02	1.2502E+00	1.347E+02	1.284E-01
1.037004E+01	2.42944E+01	1.6008E+00	1.2554E+02	1.1677E+00	1.124E+02	1.201E-01
1.103212E+01	2.43392E+01	1.4269E+00	1.0467E+02	1.0893E+00	9.385E+01	1.124E-01
1.179334E+01	2.43684E+01	1.2717E+00	8.7268E+01	1.0153E+00	7.835E+01	1.051E-01
1.260708E+01	2.44243E+01	1.1261E+00	7.2289E+01	9.4556E-01	6.494E+01	9.834E-02
1.347697E+01	2.44264E+01	9.9494E-01	5.9747E+01	8.8001E-01	5.370E+01	9.200E-02
1.440688E+01	2.44195E+01	8.7882E-01	4.9367E+01	8.1859E-01	4.440E+01	8.606E-02
1.540095E+01	2.44067E+01	7.7631E-01	4.0794E+01	7.6119E-01	3.672E+01	8.050E-02
1.646362E+01	2.43901E+01	6.8580E-01	3.3712E+01	7.0769E-01	3.036E+01	7.531E-02
1.759961E+01	2.43712E+01	6.0588E-01	2.7861E+01	6.5796E-01	2.511E+01	7.045E-02
1.881398E+01	2.43509E+01	5.3531E-01	2.3027E+01	6.1183E-01	2.076E+01	6.590E-02
2.011215E+01	2.43301E+01	4.7298E-01	1.9032E+01	5.6915E-01	1.717E+01	6.165E-02
2.149988E+01	2.43093E+01	4.1793E-01	1.5732E+01	5.2974E-01	1.420E+01	5.767E-02
2.298338E+01	2.42889E+01	3.6931E-01	1.3004E+01	4.9344E-01	1.174E+01	5.395E-02
2.456923E+01	2.42694E+01	3.2636E-01	1.0750E+01	4.6006E-01	9.707E+00	5.046E-02
2.626450E+01	2.42512E+01	2.8815E-01	8.8790E+00	4.2942E-01	8.018E+00	4.721E-02
2.807676E+01	2.42333E+01	2.5208E-01	7.2662E+00	4.0135E-01	6.563E+00	4.416E-02
3.001405E+01	2.42153E+01	2.2018E-01	5.9369E+00	3.7566E-01	5.363E+00	4.131E-02
3.208502E+01	2.41978E+01	1.9232E-01	4.8510E+00	3.5220E-01	4.383E+00	3.864E-02
3.429889E+01	2.41810E+01	1.6799E-01	3.9638E+00	3.3079E-01	3.582E+00	3.615E-02
3.666551E+01	2.41653E+01	1.4673E-01	3.2386E+00	3.1128E-01	2.927E+00	3.381E-02
3.919543E+01	2.41506E+01	1.2816E-01	2.6462E+00	2.9351E-01	2.392E+00	3.163E-02
4.189992E+01	2.41369E+01	1.1195E-01	2.1623E+00	2.7732E-01	1.955E+00	2.959E-02
4.479101E+01	2.41242E+01	9.7787E-02	1.7669E+00	2.6260E-01	1.598E+00	2.768E-02
4.788159E+01	2.41125E+01	8.5421E-02	1.4438E+00	2.4920E-01	1.306E+00	2.589E-02
5.118542E+01	2.41018E+01	7.4621E-02	1.1798E+00	2.3699E-01	1.067E+00	2.422E-02
5.471721E+01	2.40920E+01	6.5188E-02	9.6417E-01	2.2588E-01	8.719E-01	2.266E-02
5.849270E+01	2.40831E+01	5.6949E-02	7.8795E-01	2.1574E-01	7.125E-01	2.120E-02
6.252870E+01	2.40750E+01	4.9753E-02	6.4394E-01	2.0649E-01	5.823E-01	1.983E-02
6.684318E+01	2.40676E+01	4.3467E-02	5.2627E-01	1.9802E-01	4.759E-01	1.855E-02
7.145536E+01	2.40609E+01	3.7976E-02	4.3011E-01	1.9026E-01	3.889E-01	1.735E-02
7.638578E+01	2.40549E+01	3.3179E-02	3.5153E-01	1.8313E-01	3.178E-01	1.623E-02
8.165640E+01	2.40495E+01	2.8939E-02	2.8682E-01	1.7655E-01	2.593E-01	1.518E-02
8.729069E+01	2.40444E+01	2.5144E-02	2.3312E-01	1.7047E-01	2.107E-01	1.420E-02
9.331374E+01	2.40399E+01	2.1847E-02	1.8948E-01	1.6483E-01	1.713E-01	1.329E-02
9.975239E+01	2.40357E+01	1.8983E-02	1.5401E-01	1.5958E-01	1.392E-01	1.243E-02
1.066353E+02	2.40320E+01	1.6494E-02	1.2518E-01	1.5466E-01	1.132E-01	1.163E-02
1.139931E+02	2.40286E+01	1.4332E-02	1.0175E-01	1.5005E-01	9.198E-02	1.088E-02
1.218587E+02	2.40256E+01	1.2453E-02	8.2707E-02	1.4569E-01	7.476E-02	1.017E-02
1.302669E+02	2.40229E+01	1.0821E-02	6.7228E-02	1.4156E-01	6.077E-02	9.518E-03
1.392553E+02	2.40204E+01	9.4030E-03	5.4647E-02	1.3764E-01	4.939E-02	8.903E-03
1.488640E+02	2.40182E+01	8.1708E-03	4.4421E-02	1.3389E-01	4.014E-02	8.329E-03
1.591356E+02	2.40162E+01	7.1002E-03	3.6109E-02	1.3029E-01	3.263E-02	7.791E-03
1.701159E+02	2.40145E+01	6.1699E-03	2.9352E-02	1.2683E-01	2.652E-02	7.288E-03
1.818539E+02	2.40129E+01	5.3615E-03	2.3860E-02	1.2348E-01	2.156E-02	6.818E-03
1.944018E+02	2.40115E+01	4.6591E-03	1.9396E-02	1.2024E-01	1.752E-02	6.378E-03
2.078156E+02	2.40102E+01	4.0488E-03	1.5767E-02	1.1709E-01	1.424E-02	5.966E-03
2.221548E+02	2.40091E+01	3.5185E-03	1.2818E-02	1.1402E-01	1.157E-02	5.581E-03
2.374835E+02	2.40081E+01	3.0576E-03	1.0420E-02	1.1103E-01	9.408E-03	5.221E-03
2.538699E+02	2.40072E+01	2.6571E-03	8.4706E-03	1.0810E-01	7.647E-03	4.884E-03
2.713869E+02	2.40064E+01	2.3091E-03	6.8861E-03	1.0523E-01	6.215E-03	4.569E-03

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.901126E+02	2.40057E+01	2.0067E-03	5.5980E-03	1.0242E-01	5.052E-03	4.274E-03
3.101304E+02	2.40050E+01	1.7439E-03	4.5509E-03	9.9663E-02	4.106E-03	3.998E-03
3.315294E+02	2.40045E+01	1.5156E-03	3.6997E-03	9.6953E-02	3.337E-03	3.740E-03
3.544049E+02	2.40040E+01	1.3171E-03	3.0077E-03	9.4292E-02	2.713E-03	3.498E-03
3.788588E+02	2.40035E+01	1.1447E-03	2.4452E-03	9.1676E-02	2.205E-03	3.273E-03
4.050001E+02	2.40031E+01	9.9480E-04	1.9879E-03	8.9105E-02	1.792E-03	3.061E-03
4.329451E+02	2.40028E+01	8.6456E-04	1.6161E-03	8.6578E-02	1.457E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 215

Mn Z = 25

Atomic weight = 5.493800E+01 g/mol, nominal density ρ (g/cm³) = 7.4300E+00

$\mu_{\text{ph}}(\text{barns/atom}) = \mu(\text{cm}^2/\text{g}) \times 9.12268\text{E}+01$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 7.65960\text{E}+05$

Edges. Edge energies (keV):

K		6.53900E+00	L	I	7.69000E-00	L	II	6.51400E-00	L	III	6.40300E-01
M	I	8.39000E-02	M	II	4.86000E-02	M	III	4.86000E-02	M	IV	7.26159E-03
M	V	7.14378E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -9.8594E-02, -6.1200E-02 e/atom

Nuclear Thomson correction f_{NT} = -6.2409E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
7.000906E-03	4.87567E+00	0.0000E+00	0.0000E+00	1.8048E-05	0.000E+00	1.771E+02
7.108063E-03	4.76264E+00	0.0000E+00	0.0000E+00	1.9528E-05	0.000E+00	1.744E+02
7.116359E-03	4.74787E+00	0.0000E+00	0.0000E+00	1.9646E-05	0.000E+00	1.742E+02
7.136638E-03	4.69094E+00	0.0000E+00	0.0000E+00	1.9938E-05	0.000E+00	1.737E+02
7.179501E-03	4.68054E+00	8.6582E-02	9.2372E+03	2.0565E-05	0.000E+00	1.727E+02
7.225283E-03	4.60492E+00	8.7712E-02	9.2985E+03	2.1250E-05	0.000E+00	1.716E+02
7.254329E-03	4.43161E+00	8.8433E-02	9.3374E+03	2.1694E-05	0.000E+00	1.709E+02
7.286658E-03	4.56450E+00	4.3229E-01	4.5441E+04	2.2197E-05	0.000E+00	1.702E+02
7.297899E-03	4.60423E+00	4.3365E-01	4.5514E+04	2.2374E-05	0.000E+00	1.699E+02
7.406823E-03	4.74833E+00	4.4694E-01	4.6220E+04	2.4142E-05	0.000E+00	1.674E+02
1.069000E-02	4.87379E+00	8.9599E-01	6.4199E+04	1.4531E-04	0.000E+00	1.160E+02
1.142761E-02	4.86446E+00	1.0032E+00	6.7239E+04	1.9779E-04	0.000E+00	1.085E+02
1.221612E-02	4.85674E+00	1.1196E+00	7.0201E+04	2.6774E-04	0.000E+00	1.015E+02
1.305903E-02	4.85198E+00	1.2460E+00	7.3081E+04	3.6046E-04	0.000E+00	9.494E+01
1.396010E-02	4.85154E+00	1.3827E+00	7.5867E+04	4.8266E-04	0.000E+00	8.881E+01
1.492335E-02	4.85683E+00	1.5303E+00	7.8543E+04	6.4282E-04	0.000E+00	8.308E+01
1.595306E-02	4.86935E+00	1.6889E+00	8.1089E+04	8.5156E-04	0.000E+00	7.772E+01
1.705382E-02	4.89071E+00	1.8586E+00	8.3479E+04	1.1221E-03	0.000E+00	7.270E+01
1.823053E-02	4.92262E+00	2.0393E+00	8.5683E+04	1.4708E-03	0.000E+00	6.801E+01
1.948844E-02	4.96681E+00	2.2306E+00	8.7669E+04	1.9177E-03	0.000E+00	6.362E+01
2.083314E-02	5.02507E+00	2.4316E+00	8.9401E+04	2.4875E-03	0.000E+00	5.951E+01
2.227063E-02	5.09930E+00	2.6413E+00	9.0842E+04	3.2098E-03	0.000E+00	5.567E+01
2.380730E-02	5.19091E+00	2.8582E+00	9.1957E+04	4.1206E-03	0.000E+00	5.208E+01
2.545001E-02	5.30149E+00	3.0804E+00	9.2709E+04	5.2629E-03	0.000E+00	4.872E+01
2.720606E-02	5.43236E+00	3.3057E+00	9.3068E+04	6.6879E-03	0.000E+00	4.557E+01
2.908327E-02	5.58491E+00	3.5314E+00	9.3005E+04	8.4558E-03	0.000E+00	4.263E+01
3.109002E-02	5.75947E+00	3.7511E+00	9.2415E+04	1.0638E-02	0.000E+00	3.988E+01
3.323523E-02	5.95150E+00	3.9586E+00	9.1232E+04	1.3316E-02	0.000E+00	3.731E+01
3.552846E-02	6.15427E+00	4.1504E+00	8.9479E+04	1.6586E-02	0.000E+00	3.490E+01
3.797993E-02	6.35760E+00	4.3234E+00	8.7191E+04	2.0559E-02	0.000E+00	3.264E+01
4.060054E-02	6.54294E+00	4.4745E+00	8.4415E+04	2.5359E-02	0.000E+00	3.054E+01
4.340198E-02	6.66665E+00	4.6014E+00	8.1205E+04	3.1129E-02	0.000E+00	2.857E+01
4.639671E-02	6.55405E+00	4.7022E+00	7.7628E+04	3.8028E-02	0.000E+00	2.672E+01
4.762800E-02	6.20116E+00	4.7343E+00	7.6138E+04	4.1084E-02	0.000E+00	2.603E+01
4.835700E-02	5.35353E+00	4.7510E+00	7.5254E+04	4.2952E-02	0.000E+00	2.564E+01
4.855140E-02	4.21071E+00	4.7551E+00	7.5018E+04	4.3458E-02	0.000E+00	2.554E+01
4.884300E-02	5.54427E+00	7.0772E+00	1.1099E+05	4.4223E-02	0.000E+00	2.538E+01
4.959809E-02	6.78893E+00	6.9247E+00	1.0694E+05	4.6236E-02	0.000E+00	2.500E+01
5.302035E-02	8.26842E+00	6.3735E+00	9.2074E+04	5.5948E-02	0.000E+00	2.338E+01
5.667876E-02	8.82114E+00	6.0061E+00	8.1167E+04	6.7384E-02	0.000E+00	2.187E+01
6.058959E-02	9.17629E+00	5.7945E+00	7.3253E+04	8.0778E-02	0.000E+00	2.046E+01
6.477028E-02	9.46762E+00	5.5564E+00	6.6892E+04	9.6387E-02	0.000E+00	1.914E+01
6.923942E-02	9.72427E+00	5.5542E+00	6.1443E+04	1.1448E-01	0.000E+00	1.791E+01
7.401595E-02	9.94746E+00	5.4705E+00	5.6611E+04	1.3536E-01	0.000E+00	1.675E+01
7.912411E-02	1.01123E+01	5.3977E+00	5.2253E+04	1.5932E-01	0.000E+00	1.567E+01
8.222200E-02	1.01176E+01	5.3596E+00	4.9929E+04	1.7463E-01	0.000E+00	1.508E+01
8.348050E-02	9.99109E+00	5.3453E+00	4.9044E+04	1.8101E-01	0.000E+00	1.485E+01
8.381610E-02	9.79639E+00	5.3415E+00	4.8814E+04	1.8272E-01	0.000E+00	1.479E+01
8.431950E-02	1.00228E+01	5.7433E+00	5.2172E+04	1.8531E-01	0.000E+00	1.470E+01
8.458368E-02	1.00962E+01	5.7418E+00	5.1996E+04	1.8667E-01	0.000E+00	1.466E+01
8.557800E-02	1.02519E+01	5.7364E+00	5.1343E+04	1.9184E-01	0.000E+00	1.449E+01
9.041995E-02	1.06219E+01	5.7149E+00	4.8412E+04	2.1775E-01	0.000E+00	1.371E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
9.665893E-02	1.09524E+01	5.6970E+00	4.5145E+04	2.5288E-01	0.000E+00	1.283E+01
1.033284E-01	1.12573E+01	5.6848E+00	4.2140E+04	2.9239E-01	0.000E+00	1.200E+01
1.104581E-01	1.15559E+01	5.6777E+00	3.9371E+04	3.3660E-01	0.000E+00	1.122E+01
1.180797E-01	1.18579E+01	5.6747E+00	3.6811E+04	3.8582E-01	0.000E+00	1.050E+01
1.262272E-01	1.21705E+01	5.6740E+00	3.4431E+04	4.4035E-01	0.000E+00	9.822E+00
1.349368E-01	1.25017E+01	5.6709E+00	3.2191E+04	5.0044E-01	0.000E+00	9.188E+00
1.442475E-01	1.28362E+01	5.5608E+00	2.9528E+04	5.6633E-01	0.000E+00	8.595E+00
1.542005E-01	1.31400E+01	5.4373E+00	2.7009E+04	6.3822E-01	0.000E+00	8.040E+00
1.648404E-01	1.34258E+01	5.3132E+00	2.4689E+04	7.1626E-01	0.000E+00	7.521E+00
1.762144E-01	1.36967E+01	5.1855E+00	2.2540E+04	8.0052E-01	0.000E+00	7.036E+00
1.883732E-01	1.39546E+01	5.0514E+00	2.0540E+04	8.9104E-01	0.000E+00	6.582E+00
2.013709E-01	1.41998E+01	4.9083E+00	1.8670E+04	9.8779E-01	0.000E+00	6.157E+00
2.152655E-01	1.44295E+01	4.7517E+00	1.6908E+04	1.0907E+00	0.000E+00	5.760E+00
2.301188E-01	1.46387E+01	4.5816E+00	1.5250E+04	1.1994E+00	0.000E+00	5.388E+00
2.459970E-01	1.48229E+01	4.3992E+00	1.3698E+04	1.3139E+00	0.000E+00	5.040E+00
2.629708E-01	1.49795E+01	4.2068E+00	1.2253E+04	1.4336E+00	0.000E+00	4.715E+00
2.811158E-01	1.51015E+01	4.0069E+00	1.0918E+04	1.5581E+00	0.000E+00	4.410E+00
3.005128E-01	1.51866E+01	3.8023E+00	9.6914E+03	1.6870E+00	0.000E+00	4.126E+00
3.212482E-01	1.52308E+01	3.5956E+00	8.5732E+03	1.8196E+00	0.000E+00	3.859E+00
3.434143E-01	1.52292E+01	3.3896E+00	7.5602E+03	1.9552E+00	0.000E+00	3.610E+00
3.671099E-01	1.51754E+01	3.1862E+00	6.6478E+03	2.0930E+00	0.000E+00	3.377E+00
3.924405E-01	1.50600E+01	2.9874E+00	5.8307E+03	2.2323E+00	0.000E+00	3.159E+00
4.195189E-01	1.48692E+01	2.7947E+00	5.1027E+03	2.3721E+00	0.000E+00	2.955E+00
4.484657E-01	1.45809E+01	2.6096E+00	4.4571E+03	2.5115E+00	0.000E+00	2.765E+00
4.794098E-01	1.41575E+01	2.4328E+00	3.8869E+03	2.6495E+00	0.000E+00	2.586E+00
5.124891E-01	1.35289E+01	2.2649E+00	3.3851E+03	2.7851E+00	0.000E+00	2.419E+00
5.478508E-01	1.25443E+01	2.1063E+00	2.9448E+03	2.9173E+00	0.000E+00	2.263E+00
5.856525E-01	1.07856E+01	1.9569E+00	2.5594E+03	3.0451E+00	0.000E+00	2.117E+00
6.260625E-01	5.92995E+00	1.8169E+00	2.2229E+03	3.1675E+00	0.000E+00	1.980E+00
6.274940E-01	5.54629E+00	1.8123E+00	2.2122E+03	3.1716E+00	0.000E+00	1.976E+00
6.370985E-01	7.07354E-01	1.7817E+00	2.1421E+03	3.1985E+00	0.000E+00	1.946E+00
6.383720E-01	-9.76022E-01	1.7778E+00	2.1331E+03	3.2020E+00	0.000E+00	1.942E+00
6.396597E-01	-4.53373E+00	1.7738E+00	2.1240E+03	3.2056E+00	0.000E+00	1.938E+00
6.435015E-01	7.75254E-02	1.1535E+01	1.3730E+04	3.2161E+00	0.000E+00	1.927E+00
6.481430E-01	1.67813E+00	1.1416E+01	1.3492E+04	3.2286E+00	0.000E+00	1.913E+00
6.507486E-01	1.72464E-01	1.1351E+01	1.3360E+04	3.2356E+00	0.000E+00	1.905E+00
6.531060E-01	2.39202E+00	1.6147E+01	1.8937E+04	3.2418E+00	0.000E+00	1.898E+00
6.546570E-01	3.80093E+00	1.6092E+01	1.8828E+04	3.2459E+00	0.000E+00	1.894E+00
6.644280E-01	7.80621E+00	1.5750E+01	1.8157E+04	3.2712E+00	0.000E+00	1.866E+00
6.692609E-01	8.95254E+00	1.5586E+01	1.7838E+04	3.2835E+00	0.000E+00	1.853E+00
7.154399E-01	1.42272E+01	1.4152E+01	1.5151E+04	3.3922E+00	0.000E+00	1.733E+00
7.536200E-01	1.57962E+01	1.3130E+01	1.3345E+04	3.4713E+00	0.000E+00	1.645E+00
7.648052E-01	1.55761E+01	1.2855E+01	1.2874E+04	3.4928E+00	0.000E+00	1.621E+00
7.651550E-01	1.55425E+01	1.2846E+01	1.2860E+04	3.4935E+00	0.000E+00	1.620E+00
7.682310E-01	1.47738E+01	1.2772E+01	1.2734E+04	3.4992E+00	0.000E+00	1.614E+00
7.728450E-01	1.58637E+01	1.4414E+01	1.4286E+04	3.5078E+00	0.000E+00	1.604E+00
7.843800E-01	1.70753E+01	1.4137E+01	1.3805E+04	3.5286E+00	0.000E+00	1.581E+00
8.175768E-01	1.87594E+01	1.3388E+01	1.2542E+04	3.5844E+00	0.000E+00	1.516E+00
8.739896E-01	2.04727E+01	1.2261E+01	1.0746E+04	3.6663E+00	0.000E+00	1.419E+00
9.342948E-01	2.16815E+01	1.1217E+01	9.1960E+03	3.7379E+00	0.000E+00	1.327E+00
9.987612E-01	2.25986E+01	1.0249E+01	7.8601E+03	3.7986E+00	0.000E+00	1.241E+00
1.067676E+00	2.33123E+01	9.3203E+00	6.6865E+03	3.8481E+00	0.000E+00	1.161E+00
1.141345E+00	2.38555E+01	8.4254E+00	5.6543E+03	3.8859E+00	0.000E+00	1.086E+00
1.220098E+00	2.42393E+01	7.5974E+00	4.7695E+03	3.9119E+00	0.000E+00	1.016E+00
1.304285E+00	2.45176E+01	6.8499E+00	4.0227E+03	3.9260E+00	0.000E+00	9.506E-01
1.394281E+00	2.47113E+01	6.1613E+00	3.3847E+03	3.9282E+00	0.000E+00	8.892E-01
1.490486E+00	2.48369E+01	5.5413E+00	2.8477E+03	3.9186E+00	0.000E+00	8.318E-01
1.593329E+00	2.49125E+01	4.9834E+00	2.3957E+03	3.8975E+00	0.000E+00	7.781E-01
1.703269E+00	2.49499E+01	4.4808E+00	2.0150E+03	3.8651E+00	0.000E+00	7.279E-01
1.820795E+00	2.49583E+01	4.0297E+00	1.6952E+03	3.8220E+00	0.000E+00	6.809E-01
1.946430E+00	2.49447E+01	3.6251E+00	1.4266E+03	3.7687E+00	0.000E+00	6.370E-01
2.080733E+00	2.49156E+01	3.2624E+00	1.2010E+03	3.7056E+00	0.000E+00	5.959E-01
2.224304E+00	2.48752E+01	2.9374E+00	1.0115E+03	3.6336E+00	0.000E+00	5.574E-01
2.377781E+00	2.48294E+01	2.6463E+00	8.5245E+02	3.5532E+00	0.000E+00	5.214E-01
2.541848E+00	2.47785E+01	2.3855E+00	7.1884E+02	3.4653E+00	0.000E+00	4.878E-01

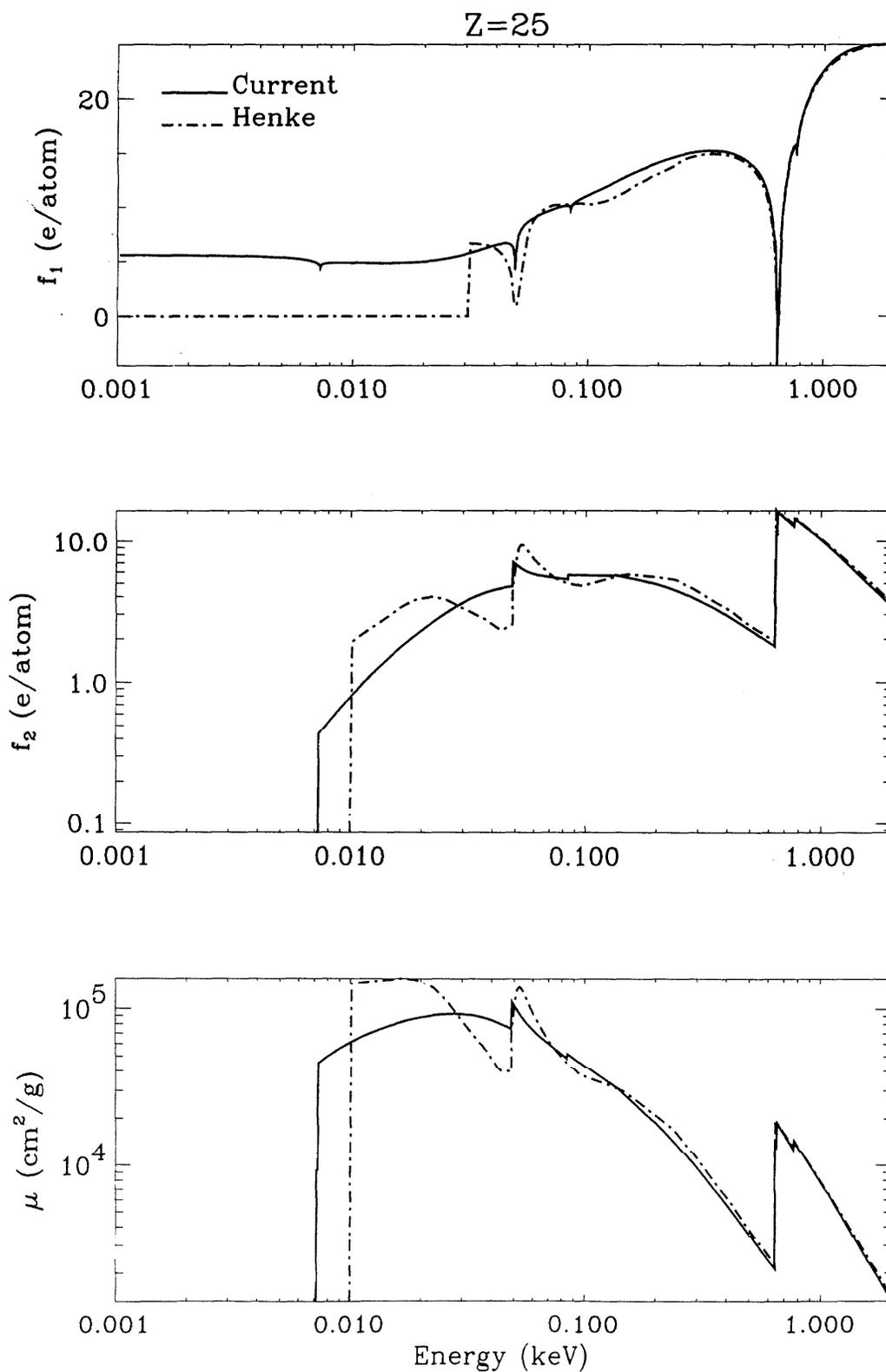
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 217

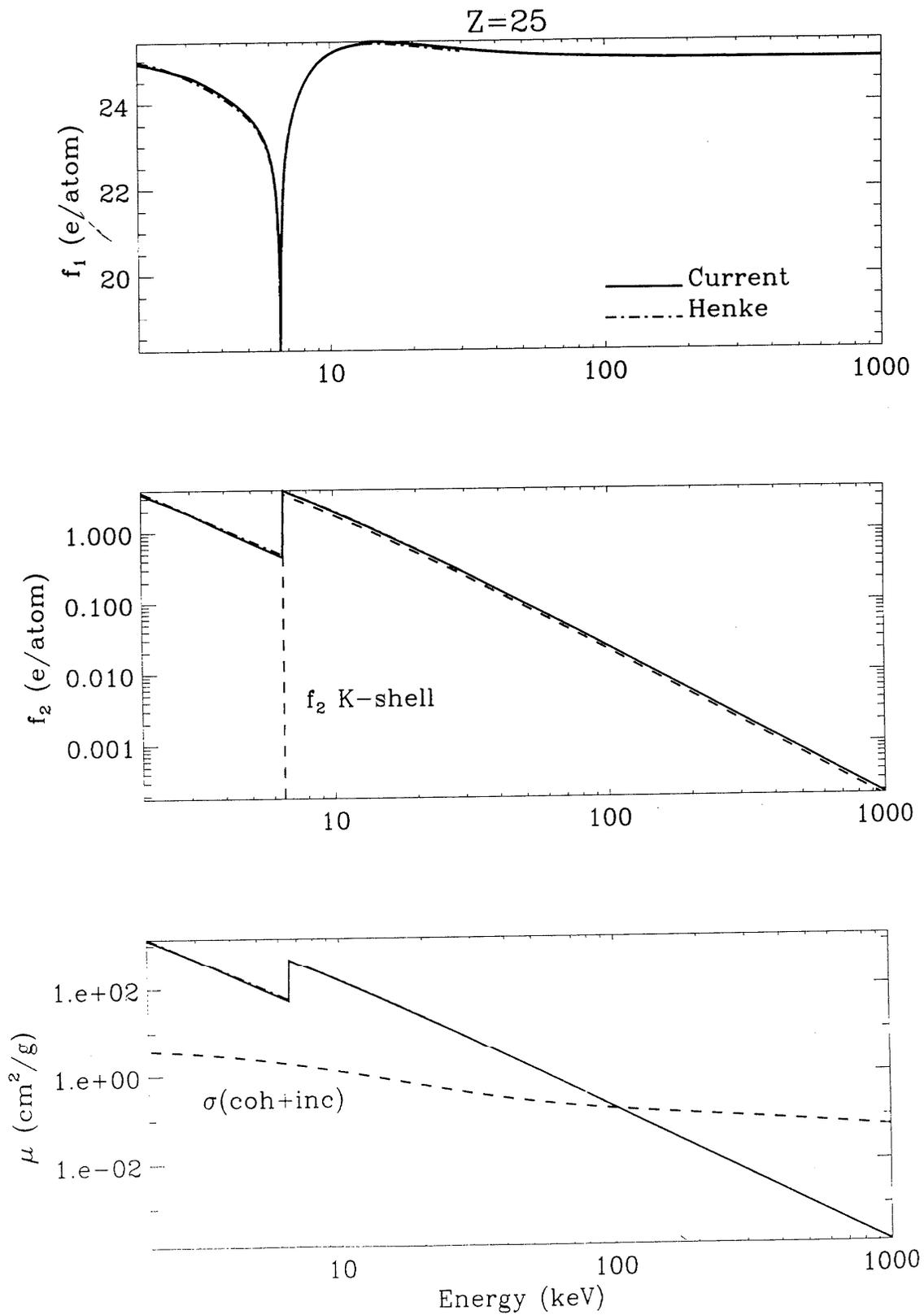
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.717235E+00	2.47246E+01	2.1404E+00	6.0336E+02	3.3707E+00	0.000E+00	4.563E-01
2.904724E+00	2.46691E+01	1.9200E+00	5.0629E+02	3.2702E+00	0.000E+00	4.268E-01
3.105150E+00	2.46120E+01	1.7102E+00	4.2186E+02	3.1645E+00	0.000E+00	3.993E-01
3.319406E+00	2.45255E+01	1.5080E+00	3.4798E+02	3.0547E+00	0.000E+00	3.735E-01
3.548445E+00	2.44274E+01	1.3310E+00	2.8731E+02	2.9414E+00	0.000E+00	3.494E-01
3.793288E+00	2.43202E+01	1.1760E+00	2.3746E+02	2.8255E+00	0.000E+00	3.269E-01
4.055024E+00	2.42039E+01	1.0400E+00	1.9645E+02	2.7078E+00	0.000E+00	3.058E-01
4.334821E+00	2.40759E+01	9.2070E-01	1.6269E+02	2.5891E+00	0.000E+00	2.860E-01
4.633924E+00	2.39312E+01	8.1589E-01	1.3486E+02	2.4700E+00	0.000E+00	2.676E-01
4.953664E+00	2.37601E+01	7.2375E-01	1.1191E+02	2.3512E+00	0.000E+00	2.503E-01
5.295467E+00	2.35437E+01	6.4266E-01	9.2957E+01	2.2334E+00	0.000E+00	2.341E-01
5.660855E+00	2.32388E+01	5.7123E-01	7.7292E+01	2.1172E+00	0.000E+00	2.190E-01
6.051453E+00	2.27115E+01	5.0825E-01	6.4331E+01	2.0030E+00	0.000E+00	2.049E-01
6.408220E+00	2.14354E+01	4.6011E-01	5.4996E+01	1.9070E+00	0.000E+00	1.935E-01
6.469004E+00	2.07891E+01	4.5266E-01	5.3597E+01	1.8914E+00	0.000E+00	1.917E-01
6.506305E+00	1.99795E+01	4.4818E-01	5.2763E+01	1.8819E+00	0.000E+00	1.906E-01
6.532461E+00	1.82218E+01	4.4509E-01	5.2189E+01	1.8753E+00	0.000E+00	1.898E-01
6.571695E+00	2.00165E+01	3.9072E+00	4.5540E+02	1.8654E+00	4.041E+02	1.887E-01
6.669780E+00	2.16410E+01	3.7970E+00	4.3604E+02	1.8412E+00	3.867E+02	1.859E-01
6.915365E+00	2.29017E+01	3.5470E+00	3.9288E+02	1.7827E+00	3.482E+02	1.793E-01
7.392525E+00	2.38502E+01	3.1829E+00	3.2979E+02	1.6773E+00	2.925E+02	1.677E-01
7.902609E+00	2.43589E+01	2.8708E+00	2.7825E+02	1.5754E+00	2.471E+02	1.569E-01
8.447890E+00	2.46957E+01	2.5884E+00	2.3469E+02	1.4775E+00	2.086E+02	1.468E-01
9.030794E+00	2.49352E+01	2.3192E+00	1.9670E+02	1.3836E+00	1.750E+02	1.373E-01
9.653919E+00	2.50944E+01	2.0682E+00	1.6409E+02	1.2938E+00	1.462E+02	1.284E-01
1.032004E+01	2.52022E+01	1.8446E+00	1.3690E+02	1.2084E+00	1.221E+02	1.201E-01
1.103212E+01	2.52757E+01	1.6453E+00	1.1423E+02	1.1273E+00	1.021E+02	1.124E-01
1.179334E+01	2.53252E+01	1.4677E+00	9.5325E+01	1.0506E+00	8.528E+01	1.051E-01
1.260708E+01	2.53579E+01	1.3092E+00	7.9543E+01	9.7820E-01	7.125E+01	9.834E-02
1.347697E+01	2.54183E+01	1.1631E+00	6.6107E+01	9.1014E-01	5.927E+01	9.200E-02
1.440688E+01	2.54240E+01	1.0284E+00	5.4675E+01	8.4632E-01	4.903E+01	8.606E-02
1.540095E+01	2.54196E+01	9.0870E-01	4.5194E+01	7.8663E-01	4.056E+01	8.050E-02
1.646362E+01	2.54086E+01	8.0299E-01	3.7359E+01	7.3097E-01	3.355E+01	7.531E-02
1.759961E+01	2.53932E+01	7.0962E-01	3.0884E+01	6.7918E-01	2.775E+01	7.045E-02
1.881398E+01	2.53751E+01	6.2716E-01	2.5533E+01	6.3111E-01	2.296E+01	6.590E-02
2.011215E+01	2.53554E+01	5.5431E-01	2.1111E+01	5.8661E-01	1.899E+01	6.165E-02
2.149988E+01	2.53349E+01	4.8995E-01	1.7455E+01	5.4551E-01	1.571E+01	5.767E-02
2.298338E+01	2.53143E+01	4.3309E-01	1.4433E+01	5.0762E-01	1.300E+01	5.395E-02
2.456923E+01	2.52941E+01	3.8284E-01	1.1935E+01	4.7277E-01	1.075E+01	5.046E-02
2.626450E+01	2.52746E+01	3.3845E-01	9.8703E+00	4.4077E-01	8.893E+00	4.721E-02
2.807676E+01	2.52565E+01	2.9781E-01	8.1245E+00	4.1144E-01	7.325E+00	4.416E-02
3.001405E+01	2.52383E+01	2.6044E-01	6.6465E+00	3.8461E-01	5.995E+00	4.131E-02
3.208502E+01	2.52200E+01	2.2761E-01	5.4337E+00	3.6010E-01	4.902E+00	3.864E-02
3.429889E+01	2.52021E+01	1.9892E-01	4.4423E+00	3.3773E-01	4.008E+00	3.615E-02
3.666551E+01	2.51851E+01	1.7386E-01	3.6320E+00	3.1735E-01	3.278E+00	3.381E-02
3.919543E+01	2.51691E+01	1.5195E-01	2.9695E+00	2.9880E-01	2.680E+00	3.163E-02
4.189992E+01	2.51541E+01	1.3281E-01	2.4278E+00	2.8191E-01	2.191E+00	2.959E-02
4.479101E+01	2.51401E+01	1.1608E-01	1.9850E+00	2.6656E-01	1.792E+00	2.768E-02
4.788159E+01	2.51272E+01	1.0146E-01	1.6230E+00	2.5259E-01	1.465E+00	2.589E-02
5.118542E+01	2.51153E+01	8.8683E-02	1.3271E+00	2.3990E-01	1.198E+00	2.422E-02
5.471721E+01	2.51044E+01	7.7519E-02	1.0852E+00	2.2835E-01	9.797E-01	2.266E-02
5.849270E+01	2.50944E+01	6.7762E-02	8.8734E-01	2.1783E-01	8.011E-01	2.120E-02
6.252870E+01	2.50853E+01	5.9235E-02	7.2561E-01	2.0824E-01	6.551E-01	1.983E-02
6.684318E+01	2.50770E+01	5.1782E-02	5.9337E-01	1.9948E-01	5.357E-01	1.855E-02
7.145536E+01	2.50695E+01	4.5268E-02	4.8524E-01	1.9148E-01	4.380E-01	1.735E-02
7.638578E+01	2.50626E+01	3.9574E-02	3.9683E-01	1.8413E-01	3.582E-01	1.623E-02
8.165640E+01	2.50565E+01	3.4540E-02	3.2399E-01	1.7738E-01	2.924E-01	1.518E-02
8.729069E+01	2.50508E+01	3.0033E-02	2.6353E-01	1.7115E-01	2.378E-01	1.420E-02
9.331374E+01	2.50456E+01	2.6114E-02	2.1436E-01	1.6538E-01	1.934E-01	1.329E-02
9.975239E+01	2.50409E+01	2.2708E-02	1.7436E-01	1.6002E-01	1.573E-01	1.243E-02
1.066353E+02	2.50367E+01	1.9746E-02	1.4183E-01	1.5502E-01	1.280E-01	1.163E-02
1.139931E+02	2.50329E+01	1.7170E-02	1.1537E-01	1.5033E-01	1.041E-01	1.088E-02
1.218587E+02	2.50294E+01	1.4931E-02	9.3852E-02	1.4592E-01	8.467E-02	1.017E-02
1.302669E+02	2.50263E+01	1.2984E-02	7.6346E-02	1.4175E-01	6.887E-02	9.518E-03
1.392553E+02	2.50235E+01	1.1291E-02	6.2106E-02	1.3779E-01	5.602E-02	8.903E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.488640E+02	2.50210E+01	9.8190E-03	5.0522E-02	1.3400E-01	4.557E-02	8.329E-03
1.591356E+02	2.50187E+01	8.5389E-03	4.1100E-02	1.3038E-01	3.706E-02	7.791E-03
1.701159E+02	2.50167E+01	7.4258E-03	3.3435E-02	1.2689E-01	3.015E-02	7.288E-03
1.818539E+02	2.50149E+01	6.4579E-03	2.7200E-02	1.2352E-01	2.452E-02	6.818E-03
1.944018E+02	2.50133E+01	5.6162E-03	2.2128E-02	1.2026E-01	1.994E-02	6.378E-03
2.078156E+02	2.50118E+01	4.8843E-03	1.8002E-02	1.1709E-01	1.622E-02	5.966E-03
2.221548E+02	2.50105E+01	4.2478E-03	1.4646E-02	1.1400E-01	1.320E-02	5.581E-03
2.374835E+02	2.50094E+01	3.6942E-03	1.1915E-02	1.1098E-01	1.073E-02	5.221E-03
2.538699E+02	2.50083E+01	3.2129E-03	9.6937E-03	1.0802E-01	8.730E-03	4.884E-03
2.713869E+02	2.50074E+01	2.7943E-03	7.8865E-03	1.0512E-01	7.101E-03	4.569E-03
2.901126E+02	2.50066E+01	2.4302E-03	6.4163E-03	1.0227E-01	5.776E-03	4.274E-03
3.101304E+02	2.50059E+01	2.1136E-03	5.2202E-03	9.9467E-02	4.698E-03	3.998E-03
3.315294E+02	2.50052E+01	1.8383E-03	4.2471E-03	9.6711E-02	3.821E-03	3.740E-03
3.544049E+02	2.50046E+01	1.5988E-03	3.4554E-03	9.3998E-02	3.108E-03	3.498E-03
3.788588E+02	2.50041E+01	1.3905E-03	2.8113E-03	9.1327E-02	2.528E-03	3.273E-03
4.050001E+02	2.50036E+01	1.2094E-03	2.2873E-03	8.8696E-02	2.056E-03	3.061E-03
4.329451E+02	2.50032E+01	1.0519E-03	1.8610E-03	8.6105E-02	1.673E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 221

Fe Z = 26

Atomic weight = 5.584700E+01 g/mol, nominal density ρ (g/cm³) = 7.8600E+00

μ_a (barns/atom) = μ (cm²/g) \times 9.27362E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 7.53493E+05

9 edges. Edge energies (keV):

K		7.11200E+00	L	I	8.46100E-00	L	II	7.21100E-00	L	III	7.08100E-01
M	I	9.29000E-02	M	II	5.40000E-02	M	III	5.40000E-02	M	IV	3.60000E-03
M	V	3.60000E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.0812E-01, -6.7800E-02 e/atom

Nuclear Thomson correction f_{NT} = -6.6403E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	4.40382E+00	1.4240E+00	1.0037E+05	1.4004E-04	0.000E+00	1.160E+02
1.142761E-02	4.40661E+00	1.5363E+00	1.0130E+05	1.9110E-04	0.000E+00	1.085E+02
1.221612E-02	4.41481E+00	1.6592E+00	1.0234E+05	2.5936E-04	0.000E+00	1.015E+02
1.305903E-02	4.42757E+00	1.7931E+00	1.0346E+05	3.5006E-04	0.000E+00	9.494E+01
1.396010E-02	4.44647E+00	1.9386E+00	1.0464E+05	4.6991E-04	0.000E+00	8.881E+01
1.492335E-02	4.47360E+00	2.0960E+00	1.0583E+05	6.2738E-04	0.000E+00	8.308E+01
1.595306E-02	4.51048E+00	2.2636E+00	1.0691E+05	8.3312E-04	0.000E+00	7.772E+01
1.705382E-02	4.55792E+00	2.4410E+00	1.0785E+05	1.1004E-03	0.000E+00	7.270E+01
1.823053E-02	4.61691E+00	2.6278E+00	1.0861E+05	1.4458E-03	0.000E+00	6.801E+01
1.948844E-02	4.68850E+00	2.8235E+00	1.0917E+05	1.8895E-03	0.000E+00	6.362E+01
2.083314E-02	4.77370E+00	3.0272E+00	1.0949E+05	2.4565E-03	0.000E+00	5.951E+01
2.227063E-02	4.87349E+00	3.2383E+00	1.0956E+05	3.1769E-03	0.000E+00	5.567E+01
2.380730E-02	4.98874E+00	3.4557E+00	1.0937E+05	4.0875E-03	0.000E+00	5.208E+01
2.545001E-02	5.12026E+00	3.6787E+00	1.0891E+05	5.2320E-03	0.000E+00	4.872E+01
2.720606E-02	5.26878E+00	3.9061E+00	1.0818E+05	6.6629E-03	0.000E+00	4.557E+01
2.908327E-02	5.43505E+00	4.1370E+00	1.0718E+05	8.4420E-03	0.000E+00	4.263E+01
3.109002E-02	5.61986E+00	4.3705E+00	1.0592E+05	1.0642E-02	0.000E+00	3.988E+01
3.323523E-02	5.82820E+00	4.5990E+00	1.0427E+05	1.3349E-02	0.000E+00	3.731E+01
3.552846E-02	6.05409E+00	4.8169E+00	1.0216E+05	1.6662E-02	0.000E+00	3.490E+01
3.797993E-02	6.29071E+00	5.0275E+00	9.9741E+04	2.0693E-02	0.000E+00	3.264E+01
4.060054E-02	6.53388E+00	5.2288E+00	9.7039E+04	2.5575E-02	0.000E+00	3.054E+01
4.340198E-02	6.77456E+00	5.4191E+00	9.4080E+04	3.1454E-02	0.000E+00	2.857E+01
4.639671E-02	6.99243E+00	5.5969E+00	9.0896E+04	3.8498E-02	0.000E+00	2.672E+01
4.959809E-02	7.12657E+00	5.7609E+00	8.7520E+04	4.6894E-02	0.000E+00	2.500E+01
5.292000E-02	7.27893E+00	5.9060E+00	8.4092E+04	5.6543E-02	0.000E+00	2.343E+01
5.632035E-02	7.45458E+00	6.0101E+00	8.0990E+04	6.7684E-02	0.000E+00	2.200E+01
5.979600E-02	7.65344E+00	6.0879E+00	7.7979E+04	8.0354E-02	0.000E+00	2.075E+01
6.334600E-02	7.87666E+00	6.1325E+00	7.5024E+04	9.4733E-02	0.000E+00	1.965E+01
6.698766E-02	8.12433E+00	6.1445E+00	7.2225E+04	1.1082E-01	0.000E+00	1.865E+01
7.072828E-02	8.39729E+00	6.1203E+00	6.9527E+04	1.2892E-01	0.000E+00	1.775E+01
7.457028E-02	8.69424E+00	6.0718E+00	6.6930E+04	1.4946E-01	0.000E+00	1.695E+01
7.851241E-02	9.01695E+00	6.0011E+00	6.4437E+04	1.7284E-01	0.000E+00	1.625E+01
8.265368E-02	9.36571E+00	5.9066E+00	6.2030E+04	1.9966E-01	0.000E+00	1.565E+01
8.699495E-02	9.74044E+00	5.7938E+00	5.9703E+04	2.2982E-01	0.000E+00	1.515E+01
9.153550E-02	1.01443E+01	5.6666E+00	5.7447E+04	2.6384E-01	0.000E+00	1.475E+01
9.627100E-02	1.05657E+01	5.5266E+00	5.5266E+04	2.9988E-01	0.000E+00	1.445E+01
1.012427E+01	1.10242E+01	5.3791E+00	5.3194E+04	3.4893E-01	0.000E+00	1.425E+01
1.061481E+01	1.15147E+01	5.2182E+00	5.1246E+04	4.0099E-01	0.000E+00	1.415E+01
1.112044E+01	1.20242E+01	5.0468E+00	4.9494E+04	4.5598E-01	0.000E+00	1.415E+01
1.164192E+01	1.25547E+01	4.8660E+00	4.7937E+04	5.1383E-01	0.000E+00	1.425E+01
1.217828E+01	1.31098E+01	4.6718E+00	4.6557E+04	5.7451E-01	0.000E+00	1.435E+01
1.273028E+01	1.36942E+01	4.4660E+00	4.5313E+04	6.3893E-01	0.000E+00	1.455E+01
1.329828E+01	1.43044E+01	4.2493E+00	4.4225E+04	7.0733E-01	0.000E+00	1.485E+01
1.388228E+01	1.49404E+01	4.0222E+00	4.3266E+04	7.7937E-01	0.000E+00	1.525E+01
1.448228E+01	1.56098E+01	3.7860E+00	4.2413E+04	8.5598E-01	0.000E+00	1.575E+01
1.509828E+01	1.63147E+01	3.5418E+00	4.1626E+04	9.3822E-01	0.000E+00	1.635E+01
1.573028E+01	1.70547E+01	3.2918E+00	4.0999E+04	1.0266E-00	0.000E+00	1.705E+01
1.638828E+01	1.79242E+01	3.0370E+00	4.0527E+04	1.1284E-00	0.000E+00	1.785E+01
1.707228E+01	1.89242E+01	2.7772E+00	4.0194E+04	1.2454E-00	0.000E+00	1.875E+01
1.778228E+01	2.00547E+01	2.5122E+00	4.0000E+04	1.3784E-00	0.000E+00	1.975E+01
1.851828E+01	2.13242E+01	2.2422E+00	4.0000E+04	1.5284E-00	0.000E+00	2.085E+01
1.928028E+01	2.27342E+01	1.9672E+00	4.0000E+04	1.6954E-00	0.000E+00	2.205E+01
2.007828E+01	2.42842E+01	1.6872E+00	4.0000E+04	1.8804E-00	0.000E+00	2.335E+01
2.090228E+01	2.59742E+01	1.4022E+00	4.0000E+04	2.0854E-00	0.000E+00	2.475E+01
2.175228E+01	2.78042E+01	1.1122E+00	4.0000E+04	2.3124E-00	0.000E+00	2.625E+01
2.262828E+01	2.97842E+01	8.1722E-01	4.0000E+04	2.5624E-00	0.000E+00	2.785E+01
2.353028E+01	3.19242E+01	5.2022E-01	4.0000E+04	2.8364E-00	0.000E+00	2.955E+01
2.445828E+01	3.42342E+01	2.2222E-01	4.0000E+04	3.1364E-00	0.000E+00	3.135E+01
2.541228E+01	3.67242E+01	9.2222E-02	4.0000E+04	3.4644E-00	0.000E+00	3.325E+01
2.639228E+01	3.93942E+01	3.2222E-02	4.0000E+04	3.8224E-00	0.000E+00	3.525E+01
2.739828E+01	4.22442E+01	1.2222E-02	4.0000E+04	4.2124E-00	0.000E+00	3.735E+01
2.843028E+01	4.52742E+01	4.2222E-03	4.0000E+04	4.6364E-00	0.000E+00	3.955E+01
2.948828E+01	4.84942E+01	1.2222E-03	4.0000E+04	5.0964E-00	0.000E+00	4.185E+01
3.057228E+01	5.19042E+01	4.2222E-04	4.0000E+04	5.5944E-00	0.000E+00	4.425E+01
3.168228E+01	5.65042E+01	1.2222E-04	4.0000E+04	6.1324E-00	0.000E+00	4.675E+01
3.281828E+01	6.13042E+01	4.2222E-05	4.0000E+04	6.7124E-00	0.000E+00	4.935E+01
3.398028E+01	6.63042E+01	1.2222E-05	4.0000E+04	7.3364E-00	0.000E+00	5.205E+01
3.516828E+01	7.15042E+01	4.2222E-06	4.0000E+04	7.9964E-00	0.000E+00	5.485E+01
3.638228E+01	7.69042E+01	1.2222E-06	4.0000E+04	8.6944E-00	0.000E+00	5.775E+01
3.762228E+01	8.35042E+01	4.2222E-07	4.0000E+04	9.4324E-00	0.000E+00	6.075E+01
3.888828E+01	9.03042E+01	1.2222E-07	4.0000E+04	1.0212E-00	0.000E+00	6.385E+01
4.018028E+01	9.73042E+01	4.2222E-08	4.0000E+04	1.1032E-00	0.000E+00	6.705E+01
4.149828E+01	1.04504E+02	1.2222E-08	4.0000E+04	1.1902E-00	0.000E+00	7.035E+01
4.284228E+01	1.12704E+02	4.2222E-09	4.0000E+04	1.2822E-00	0.000E+00	7.375E+01
4.421228E+01	1.21604E+02	1.2222E-09	4.0000E+04	1.3792E-00	0.000E+00	7.725E+01
4.560828E+01	1.31204E+02	4.2222E-10	4.0000E+04	1.4812E-00	0.000E+00	8.085E+01
4.703028E+01	1.41504E+02	1.2222E-10	4.0000E+04	1.5882E-00	0.000E+00	8.455E+01
4.847828E+01	1.52504E+02	4.2222E-11	4.0000E+04	1.6992E-00	0.000E+00	8.835E+01
4.995228E+01	1.64204E+02	1.2222E-11	4.0000E+04	1.8142E-00	0.000E+00	9.225E+01
5.145228E+01	1.76604E+02	4.2222E-12	4.0000E+04	1.9332E-00	0.000E+00	9.625E+01
5.297828E+01	1.89704E+02	1.2222E-12	4.0000E+04	2.0562E-00	0.000E+00	1.0035E+02
5.453028E+01	2.03504E+02	4.2222E-13	4.0000E+04	2.1832E-00	0.000E+00	1.0455E+02
5.610828E+01	2.18004E+02	1.2222E-13	4.0000E+04	2.3142E-00	0.000E+00	1.0885E+02
5.771228E+01	2.33204E+02	4.2222E-14	4.0000E+04	2.4492E-00	0.000E+00	1.1325E+02
5.934228E+01	2.49104E+02	1.2222E-14	4.0000E+04	2.5882E-00	0.000E+00	1.1775E+02
6.100828E+01	2.65704E+02	4.2222E-15	4.0000E+04	2.7312E-00	0.000E+00	1.2235E+02
6.270028E+01	2.83004E+02	1.2222E-15	4.0000E+04	2.8782E-00	0.000E+00	1.2705E+02
6.442828E+01	3.01004E+02	4.2222E-16	4.0000E+04	3.0292E-00	0.000E+00	1.3185E+02
6.619228E+01	3.19704E+02	1.2222E-16	4.0000E+04	3.1842E-00	0.000E+00	1.3675E+02
6.799228E+01	3.39004E+02	4.2222E-17	4.0000E+04	3.3432E-00	0.000E+00	1.4175E+02
6.982828E+01	3.59004E+02	1.2222E-17	4.0000E+04	3.5062E-00	0.000E+00	1.4685E+02
7.169228E+01	3.79704E+02	4.2222E-18	4.0000E+04	3.6732E-00	0.000E+00	1.5205E+02
7.358428E+01	4.01004E+02	1.2222E-18	4.0000E+04	3.8442E-00	0.000E+00	1.5735E+02
7.550428E+01	4.23004E+02	4.2222E-19	4.0000E+04	4.0192E-00	0.000E+00	1.6275E+02
7.745228E+01	4.45704E+02	1.2222E-19	4.0000E+04	4.1982E-00	0.000E+00	1.6825E+02
7.942828E+01	4.69104E+02	4.2222E-20	4.0000E+04	4.3812E-00	0.000E+00	1.7385E+02
8.143228E+01	4.93204E+02	1.2222E-20	4.0000E+04	4.5682E-00	0.000E+00	1.7955E+02
8.346428E+01	5.18004E+02	4.2222E-21	4.0000E+04	4.7592E-00	0.000E+00	1.8535E+02
8.552428E+01	5.43504E+02	1.2222E-21	4.0000E+04	4.9542E-00	0.000E+00	1.9125E+02
8.760428E+01	5.69704E+02	4.2222E-22	4.0000E+04	5.1532E-00	0.000E+00	1.9725E+02
8.970428E+01	5.96604E+02	1.2222E-22	4.0000E+04	5.3562E-00	0.000E+00	2.0335E+02
9.182428E+01	6.24204E+02	4.2222E-23				

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.762144E-01	1.43931E+01	5.3394E+00	2.2831E+04	8.3649E-01	0.000E+00	7.036E+00
1.883732E-01	1.46359E+01	5.2365E+00	2.0946E+04	9.3229E-01	0.000E+00	6.582E+00
2.013709E-01	1.48762E+01	5.1252E+00	1.9178E+04	1.0348E+00	0.000E+00	6.157E+00
2.152655E-01	1.51118E+01	5.0034E+00	1.7513E+04	1.1440E+00	0.000E+00	5.760E+00
2.301188E-01	1.53398E+01	4.8675E+00	1.5938E+04	1.2597E+00	0.000E+00	5.388E+00
2.459970E-01	1.55539E+01	4.7151E+00	1.4442E+04	1.3815E+00	0.000E+00	5.040E+00
2.629708E-01	1.57483E+01	4.5474E+00	1.3030E+04	1.5091E+00	0.000E+00	4.715E+00
2.811158E-01	1.59181E+01	4.3664E+00	1.1704E+04	1.6421E+00	0.000E+00	4.410E+00
3.005128E-01	1.60582E+01	4.1750E+00	1.0468E+04	1.7800E+00	0.000E+00	4.126E+00
3.212482E-01	1.61644E+01	3.9760E+00	9.3257E+03	1.9220E+00	0.000E+00	3.859E+00
3.434143E-01	1.62326E+01	3.7724E+00	8.2770E+03	2.0674E+00	0.000E+00	3.610E+00
3.671099E-01	1.62582E+01	3.5670E+00	7.3213E+03	2.2155E+00	0.000E+00	3.377E+00
3.924405E-01	1.62355E+01	3.3624E+00	6.4559E+03	2.3654E+00	0.000E+00	3.159E+00
4.195189E-01	1.61566E+01	3.1607E+00	5.6768E+03	2.5160E+00	0.000E+00	2.955E+00
4.484657E-01	1.60101E+01	2.9637E+00	4.9794E+03	2.6665E+00	0.000E+00	2.765E+00
4.794098E-01	1.57788E+01	2.7730E+00	4.3583E+03	2.8158E+00	0.000E+00	2.586E+00
5.124891E-01	1.54340E+01	2.5897E+00	3.8075E+03	2.9627E+00	0.000E+00	2.419E+00
5.478508E-01	1.49253E+01	2.4147E+00	3.3211E+03	3.1062E+00	0.000E+00	2.263E+00
5.856525E-01	1.41528E+01	2.2486E+00	2.8930E+03	3.2452E+00	0.000E+00	2.117E+00
6.260625E-01	1.28786E+01	2.0915E+00	2.5172E+03	3.3786E+00	0.000E+00	1.980E+00
6.692609E-01	1.02710E+01	1.9436E+00	2.1882E+03	3.5054E+00	0.000E+00	1.833E+00
6.939380E-01	6.60633E+00	1.8672E+00	2.0274E+03	3.5710E+00	0.000E+00	1.787E+00
7.045595E-01	1.76776E+00	1.8359E+00	1.9634E+03	3.5978E+00	0.000E+00	1.760E+00
7.066780E-01	-1.24454E+00	1.8298E+00	1.9510E+03	3.6031E+00	0.000E+00	1.754E+00
7.073919E-01	-3.49355E+00	1.8277E+00	1.9468E+03	3.6049E+00	0.000E+00	1.753E+00
7.116405E-01	1.19707E+00	1.1657E+01	1.2343E+04	3.6153E+00	0.000E+00	1.742E+00
7.154399E-01	2.82538E+00	1.1565E+01	1.2180E+04	3.6245E+00	0.000E+00	1.733E+00
7.174945E-01	2.96615E+00	1.1515E+01	1.2093E+04	3.6294E+00	0.000E+00	1.728E+00
7.203789E-01	1.39388E+00	1.1447E+01	1.1973E+04	3.6363E+00	0.000E+00	1.721E+00
7.222620E-01	2.65657E+00	1.6292E+01	1.6996E+04	3.6407E+00	0.000E+00	1.717E+00
7.247055E-01	4.99594E+00	1.6209E+01	1.6853E+04	3.6465E+00	0.000E+00	1.711E+00
7.355220E-01	8.97159E+00	1.5852E+01	1.6240E+04	3.6714E+00	0.000E+00	1.686E+00
7.648052E-01	1.33092E+01	1.4949E+01	1.4728E+04	3.7350E+00	0.000E+00	1.621E+00
8.175768E-01	1.64542E+01	1.3531E+01	1.2470E+04	3.8360E+00	0.000E+00	1.516E+00
8.291780E-01	1.67052E+01	1.3253E+01	1.2043E+04	3.8560E+00	0.000E+00	1.495E+00
8.418695E-01	1.64524E+01	1.2960E+01	1.1599E+04	3.8771E+00	0.000E+00	1.473E+00
8.452539E-01	1.56692E+01	1.2883E+01	1.1485E+04	3.8826E+00	0.000E+00	1.467E+00
8.503305E-01	1.67842E+01	1.4559E+01	1.2901E+04	3.8907E+00	0.000E+00	1.458E+00
8.630220E-01	1.80245E+01	1.4272E+01	1.2461E+04	3.9103E+00	0.000E+00	1.437E+00
8.739896E-01	1.86609E+01	1.4032E+01	1.2098E+04	3.9267E+00	0.000E+00	1.419E+00
9.342948E-01	2.08209E+01	1.2835E+01	1.0351E+04	4.0064E+00	0.000E+00	1.327E+00
9.987612E-01	2.22293E+01	1.1740E+01	8.8566E+03	4.0745E+00	0.000E+00	1.241E+00
1.067676E+00	2.32714E+01	1.0687E+01	7.5419E+03	4.1305E+00	0.000E+00	1.161E+00
1.141345E+00	2.40488E+01	9.7229E+00	6.4188E+03	4.1740E+00	0.000E+00	1.086E+00
1.220098E+00	2.46633E+01	8.8309E+00	5.4537E+03	4.2047E+00	0.000E+00	1.016E+00
1.304285E+00	2.51128E+01	7.9627E+00	4.6001E+03	4.2227E+00	0.000E+00	9.506E-01
1.394281E+00	2.54331E+01	7.1798E+00	3.8801E+03	4.2277E+00	0.000E+00	8.892E-01
1.490486E+00	2.56643E+01	6.4637E+00	3.2676E+03	4.2200E+00	0.000E+00	8.318E-01
1.593329E+00	2.58170E+01	5.8123E+00	2.7487E+03	4.1997E+00	0.000E+00	7.781E-01
1.703269E+00	2.59124E+01	5.2261E+00	2.3119E+03	4.1673E+00	0.000E+00	7.279E-01
1.820795E+00	2.59647E+01	4.6982E+00	1.9442E+03	4.1731E+00	0.000E+00	6.809E-01
1.946430E+00	2.59840E+01	4.2238E+00	1.6351E+03	4.0677E+00	0.000E+00	6.370E-01
2.080733E+00	2.59787E+01	3.7984E+00	1.3755E+03	4.0017E+00	0.000E+00	5.959E-01
2.224304E+00	2.59575E+01	3.4173E+00	1.1576E+03	3.9259E+00	0.000E+00	5.574E-01
2.377781E+00	2.59217E+01	3.0760E+00	9.7476E+02	3.8409E+00	0.000E+00	5.214E-01
2.541848E+00	2.58778E+01	2.7704E+00	8.2125E+02	3.7476E+00	0.000E+00	4.878E-01
2.717235E+00	2.58293E+01	2.4969E+00	6.9239E+02	3.6468E+00	0.000E+00	4.563E-01
2.904724E+00	2.57812E+01	2.2482E+00	5.8320E+02	3.5395E+00	0.000E+00	4.268E-01
3.105150E+00	2.57281E+01	2.0033E+00	4.8611E+02	3.4266E+00	0.000E+00	3.993E-01
3.319406E+00	2.56539E+01	1.7751E+00	4.0295E+02	3.3088E+00	0.000E+00	3.735E-01
3.548445E+00	2.55677E+01	1.5695E+00	3.3327E+02	3.1872E+00	0.000E+00	3.494E-01
3.793288E+00	2.54704E+01	1.3870E+00	2.7551E+02	3.0626E+00	0.000E+00	3.269E-01
4.055024E+00	2.53646E+01	1.2269E+00	2.2798E+02	2.9359E+00	0.000E+00	3.058E-01
4.334821E+00	2.52504E+01	1.0864E+00	1.8883E+02	2.8079E+00	0.000E+00	2.860E-01
4.633924E+00	2.51258E+01	9.6283E-01	1.5656E+02	2.6794E+00	0.000E+00	2.676E-01

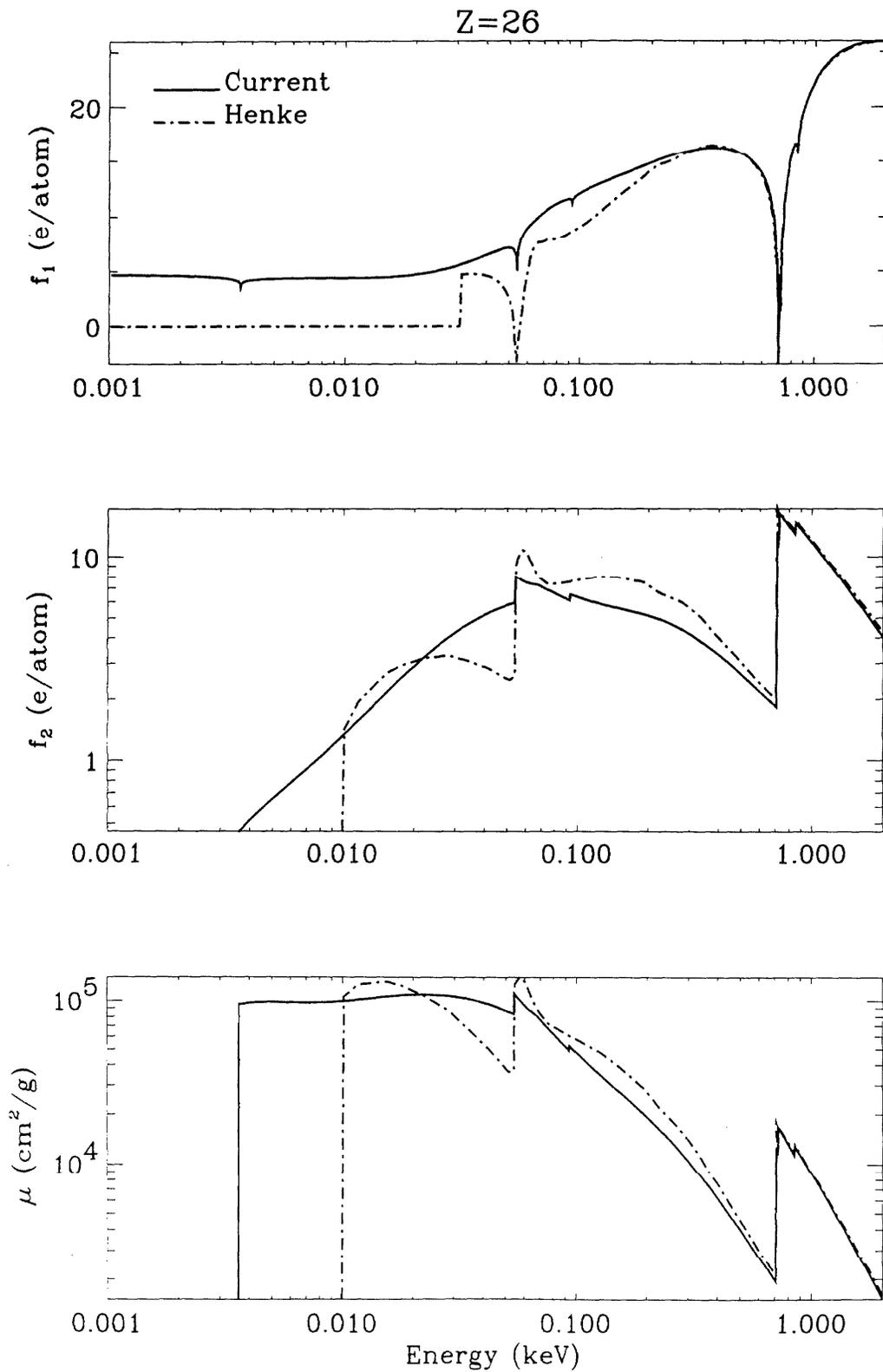
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 223

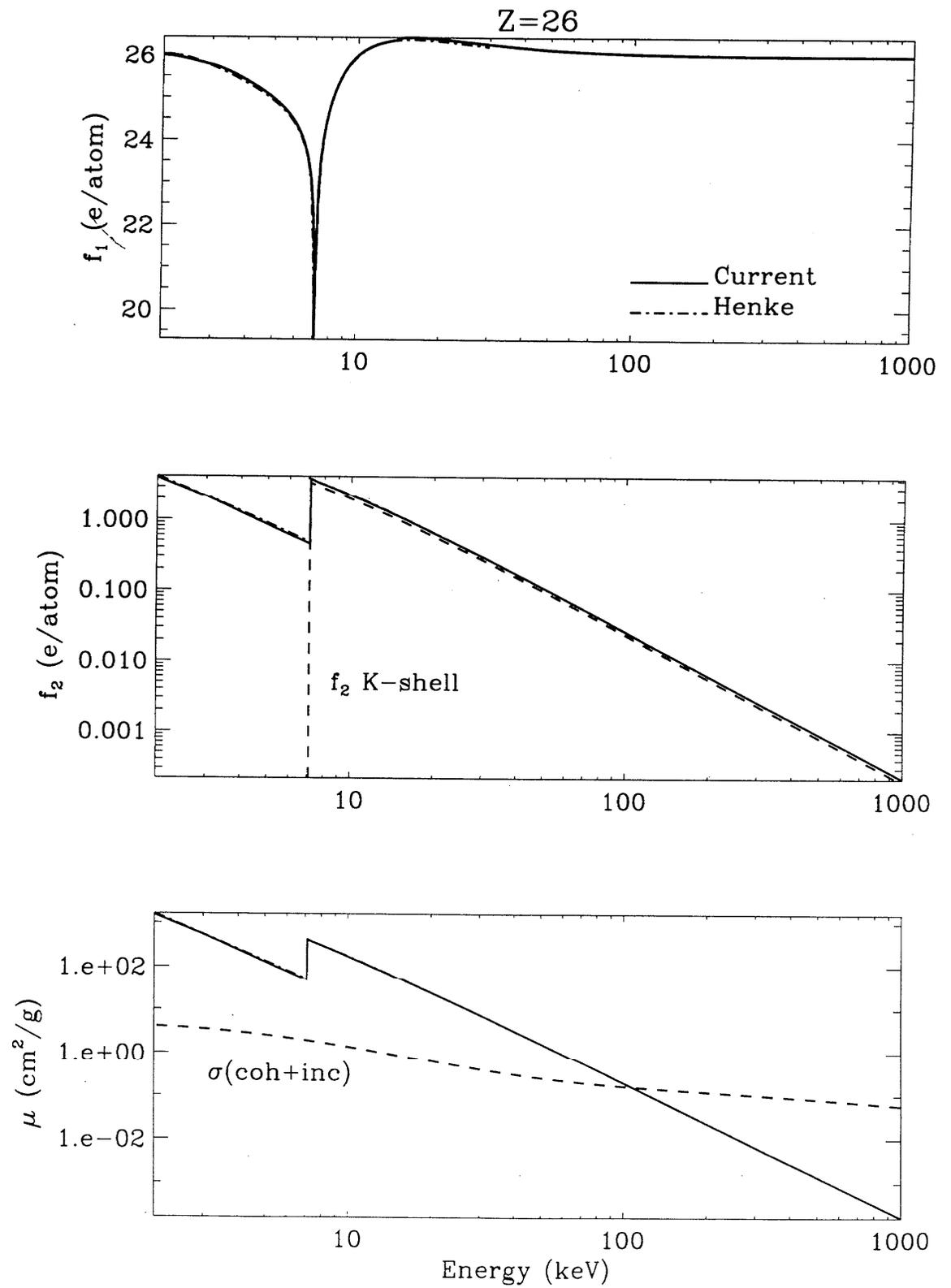
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.953664E+00	2.49864E+01	8.5419E-01	1.2993E+02	2.5511E+00	0.000E+00	2.503E-01
5.295467E+00	2.48241E+01	7.5854E-01	1.0793E+02	2.4237E+00	0.000E+00	2.341E-01
5.660855E+00	2.46232E+01	6.7426E-01	8.9748E+01	2.2979E+00	0.000E+00	2.190E-01
6.051453E+00	2.43495E+01	5.9992E-01	7.4699E+01	2.1743E+00	0.000E+00	2.049E-01
6.469004E+00	2.39082E+01	5.3430E-01	6.2234E+01	2.0532E+00	0.000E+00	1.917E-01
6.915365E+00	2.27890E+01	4.7631E-01	5.1899E+01	1.9353E+00	0.000E+00	1.793E-01
6.969760E+00	2.24649E+01	4.6996E-01	5.0807E+01	1.9217E+00	0.000E+00	1.779E-01
7.076440E+00	2.10168E+01	4.5790E-01	4.8757E+01	1.8954E+00	0.000E+00	1.752E-01
7.104888E+00	1.92682E+01	4.5477E-01	4.8230E+01	1.8885E+00	0.000E+00	1.745E-01
7.147560E+00	2.10548E+01	3.8992E+00	4.1105E+02	1.8782E+00	3.636E+02	1.735E-01
7.254240E+00	2.26714E+01	3.7877E+00	3.9342E+02	1.8529E+00	3.478E+02	1.709E-01
7.392525E+00	2.34808E+01	3.6502E+00	3.7205E+02	1.8209E+00	3.287E+02	1.677E-01
7.902609E+00	2.46830E+01	3.2650E+00	3.1131E+02	1.7103E+00	2.751E+02	1.569E-01
8.447890E+00	2.52655E+01	2.9475E+00	2.6289E+02	1.6038E+00	2.326E+02	1.468E-01
9.030794E+00	2.56451E+01	2.6546E+00	2.2149E+02	1.5016E+00	1.962E+02	1.373E-01
9.653919E+00	2.58973E+01	2.3704E+00	1.8501E+02	1.4040E+00	1.642E+02	1.284E-01
1.032004E+01	2.60660E+01	2.1145E+00	1.5439E+02	1.3109E+00	1.373E+02	1.201E-01
1.103212E+01	2.61815E+01	1.8865E+00	1.2885E+02	1.2226E+00	1.147E+02	1.124E-01
1.179334E+01	2.62607E+01	1.6832E+00	1.0754E+02	1.1389E+00	9.590E+01	1.051E-01
1.260708E+01	2.63142E+01	1.5020E+00	8.9770E+01	1.0600E+00	8.015E+01	9.834E-02
1.347697E+01	2.63498E+01	1.3404E+00	7.4939E+01	9.8577E-01	6.699E+01	9.200E-02
1.440688E+01	2.64121E+01	1.1940E+00	6.2448E+01	9.1611E-01	5.589E+01	8.606E-02
1.540095E+01	2.64211E+01	1.0562E+00	5.1676E+01	8.5093E-01	4.626E+01	8.050E-02
1.646362E+01	2.64188E+01	9.3409E-01	4.2751E+01	7.9012E-01	3.829E+01	7.531E-02
1.759961E+01	2.64094E+01	8.2587E-01	3.5358E+01	7.3352E-01	3.169E+01	7.045E-02
1.881398E+01	2.63951E+01	7.3023E-01	2.9245E+01	6.8098E-01	2.623E+01	6.590E-02
2.011215E+01	2.63778E+01	6.4572E-01	2.4191E+01	6.3231E-01	2.171E+01	6.165E-02
2.149988E+01	2.63587E+01	5.7102E-01	2.0012E+01	5.8734E-01	1.797E+01	5.767E-02
2.298338E+01	2.63387E+01	5.0500E-01	1.6556E+01	5.4588E-01	1.487E+01	5.395E-02
2.456923E+01	2.63183E+01	4.4663E-01	1.3697E+01	5.0773E-01	1.231E+01	5.046E-02
2.626450E+01	2.62983E+01	3.9503E-01	1.1333E+01	4.7270E-01	1.019E+01	4.721E-02
2.807676E+01	2.62809E+01	3.4777E-01	9.3330E+00	4.4058E-01	8.397E+00	4.416E-02
3.001405E+01	2.62618E+01	3.0571E-01	7.6746E+00	4.1120E-01	6.911E+00	4.131E-02
3.208502E+01	2.62430E+01	2.6786E-01	6.2905E+00	3.8435E-01	5.667E+00	3.864E-02
3.429889E+01	2.62243E+01	2.3420E-01	5.1450E+00	3.5985E-01	4.636E+00	3.615E-02
3.666551E+01	2.62062E+01	2.0478E-01	4.2083E+00	3.3752E-01	3.793E+00	3.381E-02
3.919543E+01	2.61889E+01	1.7906E-01	3.4423E+00	3.1719E-01	3.102E+00	3.163E-02
4.189992E+01	2.61725E+01	1.5658E-01	2.8158E+00	2.9870E-01	2.538E+00	2.959E-02
4.479101E+01	2.61573E+01	1.3691E-01	2.3032E+00	2.8189E-01	2.076E+00	2.768E-02
4.788159E+01	2.61431E+01	1.1972E-01	1.8840E+00	2.6661E-01	1.698E+00	2.589E-02
5.118542E+01	2.61300E+01	1.0469E-01	1.5411E+00	2.5271E-01	1.389E+00	2.422E-02
5.471721E+01	2.61179E+01	9.1550E-02	1.2607E+00	2.4008E-01	1.137E+00	2.266E-02
5.849270E+01	2.61068E+01	8.0062E-02	1.0313E+00	2.2859E-01	9.298E-01	2.120E-02
6.252870E+01	2.60966E+01	7.0017E-02	8.4372E-01	2.1812E-01	7.606E-01	1.983E-02
6.684318E+01	2.60873E+01	6.1234E-02	6.9026E-01	2.0857E-01	6.222E-01	1.855E-02
7.145536E+01	2.60789E+01	5.3554E-02	5.6472E-01	1.9985E-01	5.090E-01	1.735E-02
7.638578E+01	2.60712E+01	4.6838E-02	4.6203E-01	1.9186E-01	4.164E-01	1.623E-02
8.165640E+01	2.60643E+01	4.0894E-02	3.7736E-01	1.8452E-01	3.400E-01	1.518E-02
8.729069E+01	2.60579E+01	3.5564E-02	3.0699E-01	1.7777E-01	2.766E-01	1.420E-02
9.331374E+01	2.60521E+01	3.0930E-02	2.4975E-01	1.7153E-01	2.250E-01	1.329E-02
9.975239E+01	2.60468E+01	2.6900E-02	2.0319E-01	1.6575E-01	1.830E-01	1.243E-02
1.066353E+02	2.60420E+01	2.3395E-02	1.6531E-01	1.6036E-01	1.489E-01	1.163E-02
1.139931E+02	2.60376E+01	2.0347E-02	1.3450E-01	1.5533E-01	1.211E-01	1.088E-02
1.218587E+02	2.60337E+01	1.7697E-02	1.0943E-01	1.5060E-01	9.853E-02	1.017E-02
1.302669E+02	2.60302E+01	1.5392E-02	8.9031E-02	1.4615E-01	8.015E-02	9.518E-03
1.392553E+02	2.60270E+01	1.3387E-02	7.2438E-02	1.4192E-01	6.520E-02	8.903E-03
1.488640E+02	2.60241E+01	1.1644E-02	5.8938E-02	1.3791E-01	5.304E-02	8.329E-03
1.591356E+02	2.60215E+01	1.0128E-02	4.7955E-02	1.3407E-01	4.314E-02	7.791E-03
1.701159E+02	2.60192E+01	8.8094E-03	3.9019E-02	1.3039E-01	3.510E-02	7.288E-03
1.818539E+02	2.60171E+01	7.6625E-03	3.1749E-02	1.2685E-01	2.855E-02	6.818E-03
1.944018E+02	2.60153E+01	6.6650E-03	2.5833E-02	1.2342E-01	2.322E-02	6.378E-03
2.078156E+02	2.60136E+01	5.7975E-03	2.1020E-02	1.2010E-01	1.889E-02	5.966E-03
2.221548E+02	2.60121E+01	5.0429E-03	1.7104E-02	1.1687E-01	1.537E-02	5.581E-03
2.374835E+02	2.60108E+01	4.3866E-03	1.3918E-02	1.1373E-01	1.250E-02	5.221E-03
2.538699E+02	2.60096E+01	3.8158E-03	1.1325E-02	1.1066E-01	1.017E-02	4.884E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.713869E+02	2.60086E+01	3.3192E-03	9.2156E-03	1.0765E-01	8.272E-03	4.569E-03
2.901126E+02	2.60076E+01	2.8873E-03	7.4991E-03	1.0470E-01	6.729E-03	4.274E-03
3.101304E+02	2.60068E+01	2.5117E-03	6.1023E-03	1.0181E-01	5.474E-03	3.998E-03
3.315294E+02	2.60060E+01	2.1849E-03	4.9658E-03	9.8974E-02	4.453E-03	3.740E-03
3.544049E+02	2.60053E+01	1.9006E-03	4.0409E-03	9.6184E-02	3.622E-03	3.498E-03
3.788588E+02	2.60047E+01	1.6534E-03	3.2883E-03	9.3441E-02	2.947E-03	3.273E-03
4.050004E+02	2.60042E+01	1.4383E-03	2.6760E-03	9.0744E-02	2.397E-03	3.061E-03
4.329451E+02	2.60037E+01	1.2512E-03	2.1776E-03	8.8092E-02	1.950E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 227

Co Z = 27

Atomic weight = 5.893320E+01 g/mol, nominal density ρ (g/cm³) = 8.9000E+00

μ_{rel} (barns/atom) = μ (cm²/g) \times 9.78609E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 7.14034E+05

ν edges. Edge energies (keV):

K		7.70890E+00	L	I	9.25600E-00	L	II	7.93600E-00	L	III	7.78600E-01
M	I	1.00700E-00	M	II	5.95000E-02	M	III	5.95000E-02	M	IV	2.90000E-03
M	V	2.90000E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.1819E-01, -7.3800E-02 e/atom

Nuclear Thomson correction f_{NT} = -6.7859E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	4.07651E+00	1.5562E+00	1.0395E+05	1.2743E-04	0.000E+00	1.160E+02
1.142761E-02	4.07931E+00	1.6781E+00	1.0485E+05	1.7442E-04	0.000E+00	1.085E+02
1.221612E-02	4.08644E+00	1.8115E+00	1.0588E+05	2.3740E-04	0.000E+00	1.015E+02
1.305903E-02	4.09903E+00	1.9562E+00	1.0696E+05	3.2135E-04	0.000E+00	9.494E+01
1.396010E-02	4.11806E+00	2.1124E+00	1.0804E+05	4.3259E-04	0.000E+00	8.881E+01
1.492335E-02	4.14462E+00	2.2802E+00	1.0910E+05	5.7917E-04	0.000E+00	8.308E+01
1.595306E-02	4.17992E+00	2.4597E+00	1.1009E+05	7.7122E-04	0.000E+00	7.772E+01
1.705382E-02	4.22518E+00	2.6509E+00	1.1099E+05	1.0214E-03	0.000E+00	7.270E+01
1.823053E-02	4.28168E+00	2.8536E+00	1.1177E+05	1.3456E-03	0.000E+00	6.801E+01
1.948844E-02	4.35067E+00	3.0675E+00	1.1239E+05	1.7632E-03	0.000E+00	6.362E+01
2.083314E-02	4.43344E+00	3.2922E+00	1.1284E+05	2.2982E-03	0.000E+00	5.951E+01
2.227063E-02	4.53124E+00	3.5274E+00	1.1309E+05	2.9799E-03	0.000E+00	5.567E+01
2.380730E-02	4.64533E+00	3.7723E+00	1.1314E+05	3.8436E-03	0.000E+00	5.208E+01
2.545001E-02	4.77694E+00	4.0266E+00	1.1297E+05	4.9320E-03	0.000E+00	4.872E+01
2.720606E-02	4.92734E+00	4.2894E+00	1.1258E+05	6.2962E-03	0.000E+00	4.557E+01
2.908327E-02	5.09779E+00	4.5603E+00	1.1196E+05	7.9967E-03	0.000E+00	4.263E+01
3.109002E-02	5.28966E+00	4.8385E+00	1.1112E+05	1.0105E-02	0.000E+00	3.988E+01
3.323523E-02	5.50445E+00	5.1236E+00	1.1008E+05	1.2705E-02	0.000E+00	3.731E+01
3.552846E-02	5.74388E+00	5.4151E+00	1.0883E+05	1.5893E-02	0.000E+00	3.490E+01
3.797993E-02	6.01002E+00	5.7127E+00	1.0740E+05	1.9784E-02	0.000E+00	3.264E+01
4.060054E-02	6.30538E+00	6.0162E+00	1.0581E+05	2.4505E-02	0.000E+00	3.054E+01
4.340198E-02	6.67459E+00	6.3044E+00	1.0372E+05	3.0204E-02	0.000E+00	2.857E+01
4.639671E-02	7.06312E+00	6.5733E+00	1.0116E+05	3.7048E-02	0.000E+00	2.672E+01
4.959809E-02	7.46141E+00	6.8347E+00	9.8394E+04	4.5223E-02	0.000E+00	2.500E+01
5.302035E-02	7.85964E+00	7.0873E+00	9.5446E+04	5.4938E-02	0.000E+00	2.338E+01
5.667876E-02	8.12459E+00	7.1365E+00	8.9904E+04	6.6422E-02	0.000E+00	2.187E+01
5.831000E-02	7.95238E+00	7.0944E+00	8.6874E+04	7.1903E-02	0.000E+00	2.126E+01
5.920250E-02	7.32491E+00	7.0696E+00	8.5265E+04	7.4994E-02	0.000E+00	2.094E+01
5.944050E-02	6.41648E+00	7.0627E+00	8.4842E+04	7.5829E-02	0.000E+00	2.086E+01
5.979750E-02	7.50344E+00	8.9241E+00	1.0656E+05	7.7091E-02	0.000E+00	2.073E+01
6.058959E-02	8.46511E+00	8.8069E+00	1.0379E+05	7.9927E-02	0.000E+00	2.046E+01
6.069000E-02	8.53783E+00	8.7924E+00	1.0344E+05	8.0290E-02	0.000E+00	2.043E+01
6.477028E-02	9.99361E+00	8.2619E+00	9.1080E+04	9.5727E-02	0.000E+00	1.914E+01
6.923942E-02	1.07000E+01	7.8176E+00	8.0619E+04	1.1412E-01	0.000E+00	1.791E+01
7.401695E-02	1.11971E+01	7.4801E+00	7.2160E+04	1.3541E-01	0.000E+00	1.675E+01
7.912411E-02	1.16018E+01	7.1971E+00	6.4948E+04	1.5994E-01	0.000E+00	1.567E+01
8.458368E-02	1.19426E+01	6.9439E+00	5.8619E+04	1.8806E-01	0.000E+00	1.466E+01
9.041995E-02	1.22207E+01	6.7099E+00	5.2987E+04	2.2012E-01	0.000E+00	1.371E+01
9.665893E-02	1.23949E+01	6.4907E+00	4.7948E+04	2.5649E-01	0.000E+00	1.283E+01
9.868600E-02	1.23849E+01	6.4253E+00	4.6490E+04	2.6874E-01	0.000E+00	1.256E+01
1.001965E-01	1.22528E+01	6.3784E+00	4.5454E+04	2.7800E-01	0.000E+00	1.237E+01
1.005993E-01	1.20449E+01	6.3661E+00	4.5185E+04	2.8048E-01	0.000E+00	1.232E+01
1.012035E-01	1.22888E+01	6.7844E+00	4.7867E+04	2.8423E-01	0.000E+00	1.225E+01
1.027140E-01	1.25366E+01	6.7462E+00	4.6898E+04	2.9367E-01	0.000E+00	1.207E+01
1.033284E-01	1.25962E+01	6.7311E+00	4.6514E+04	2.9754E-01	0.000E+00	1.200E+01
1.104581E-01	1.30306E+01	6.5708E+00	4.2475E+04	3.4363E-01	0.000E+00	1.122E+01
1.180797E-01	1.33567E+01	6.4252E+00	3.8853E+04	3.9514E-01	0.000E+00	1.050E+01
1.262272E-01	1.36488E+01	6.2918E+00	3.5591E+04	4.5238E-01	0.000E+00	9.822E+00
1.349368E-01	1.39231E+01	6.1699E+00	3.2649E+04	5.1569E-01	0.000E+00	9.188E+00
1.442475E-01	1.41876E+01	6.0579E+00	2.9987E+04	5.8535E-01	0.000E+00	8.595E+00
1.542005E-01	1.44472E+01	5.9535E+00	2.7568E+04	6.6160E-01	0.000E+00	8.040E+00
1.648404E-01	1.47051E+01	5.8536E+00	2.5356E+04	7.4464E-01	0.000E+00	7.521E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.762144E-01	1.49632E+01	5.7547E+00	2.3318E+04	8.3461E-01	0.000E+00	7.036E+00
1.883732E-01	1.52277E+01	5.6531E+00	2.1428E+04	9.3157E-01	0.000E+00	6.582E+00
2.013709E-01	1.54860E+01	5.5455E+00	1.9664E+04	1.0355E+00	0.000E+00	6.157E+00
2.152655E-01	1.57421E+01	5.4288E+00	1.8007E+04	1.1464E+00	0.000E+00	5.760E+00
2.301188E-01	1.59934E+01	5.3009E+00	1.6448E+04	1.2641E+00	0.000E+00	5.388E+00
2.459970E-01	1.62372E+01	5.1597E+00	1.4977E+04	1.3882E+00	0.000E+00	5.040E+00
2.629708E-01	1.64686E+01	5.0016E+00	1.3581E+04	1.5186E+00	0.000E+00	4.715E+00
2.811158E-01	1.66810E+01	4.8271E+00	1.2261E+04	1.6546E+00	0.000E+00	4.410E+00
3.005128E-01	1.68691E+01	4.6386E+00	1.1022E+04	1.7958E+00	0.000E+00	4.126E+00
3.212482E-01	1.70277E+01	4.4388E+00	9.8660E+03	1.9415E+00	0.000E+00	3.859E+00
3.434143E-01	1.71536E+01	4.2307E+00	8.7966E+03	2.0910E+00	0.000E+00	3.610E+00
3.671099E-01	1.72425E+01	4.0175E+00	7.8141E+03	2.2435E+00	0.000E+00	3.377E+00
3.924405E-01	1.72900E+01	3.8022E+00	6.9179E+03	2.3981E+00	0.000E+00	3.159E+00
4.195189E-01	1.72911E+01	3.5873E+00	6.1058E+03	2.5538E+00	0.000E+00	2.955E+00
4.484657E-01	1.72394E+01	3.3752E+00	5.3739E+03	2.7096E+00	0.000E+00	2.765E+00
4.794098E-01	1.71251E+01	3.1678E+00	4.7181E+03	2.8645E+00	0.000E+00	2.586E+00
5.124891E-01	1.69341E+01	2.9667E+00	4.1334E+03	3.0172E+00	0.000E+00	2.419E+00
5.478508E-01	1.66433E+01	2.7733E+00	3.6145E+03	3.1667E+00	0.000E+00	2.263E+00
5.856525E-01	1.62138E+01	2.5884E+00	3.1558E+03	3.3119E+00	0.000E+00	2.117E+00
6.260625E-01	1.55717E+01	2.4125E+00	2.7515E+03	3.4515E+00	0.000E+00	1.980E+00
6.692609E-01	1.45571E+01	2.2461E+00	2.3964E+03	3.5846E+00	0.000E+00	1.853E+00
7.154399E-01	1.27139E+01	2.0893E+00	2.0852E+03	3.7100E+00	0.000E+00	1.733E+00
7.630280E-01	7.65825E+00	1.9469E+00	1.8219E+03	3.8228E+00	0.000E+00	1.625E+00
7.648052E-01	7.22164E+00	1.9419E+00	1.8130E+03	3.8267E+00	0.000E+00	1.621E+00
7.747070E-01	2.81236E+00	1.9146E+00	1.7646E+03	3.8481E+00	0.000E+00	1.600E+00
7.777280E-01	-2.10962E+00	1.9064E+00	1.7503E+03	3.8545E+00	0.000E+00	1.594E+00
7.778214E-01	-2.47515E+00	1.9061E+00	1.7498E+03	3.8547E+00	0.000E+00	1.594E+00
7.824930E-01	2.28899E+00	1.1809E+01	1.0776E+04	3.8645E+00	0.000E+00	1.584E+00
7.896320E-01	4.20240E+00	1.1644E+01	1.0529E+04	3.8792E+00	0.000E+00	1.570E+00
7.928064E-01	2.56916E+00	1.1572E+01	1.0422E+04	3.8856E+00	0.000E+00	1.564E+00
7.941720E-01	2.39355E+00	1.6482E+01	1.4818E+04	3.8884E+00	0.000E+00	1.561E+00
7.975680E-01	6.16476E+00	1.6372E+01	1.4657E+04	3.8952E+00	0.000E+00	1.555E+00
8.094720E-01	1.01298E+01	1.5995E+01	1.4110E+04	3.9184E+00	0.000E+00	1.532E+00
8.175768E-01	1.16331E+01	1.5747E+01	1.3753E+04	3.9338E+00	0.000E+00	1.516E+00
8.739896E-01	1.65757E+01	1.4185E+01	1.1589E+04	4.0304E+00	0.000E+00	1.419E+00
9.070880E-01	1.76437E+01	1.3401E+01	1.0549E+04	4.0794E+00	0.000E+00	1.367E+00
9.209720E-01	1.74222E+01	1.3097E+01	1.0154E+04	4.0984E+00	0.000E+00	1.346E+00
9.246744E-01	1.66663E+01	1.3018E+01	1.0053E+04	4.1033E+00	0.000E+00	1.341E+00
9.302280E-01	1.77529E+01	1.4641E+01	1.1238E+04	4.1106E+00	0.000E+00	1.333E+00
9.342948E-01	1.82397E+01	1.4556E+01	1.1125E+04	4.1158E+00	0.000E+00	1.327E+00
9.441120E-01	1.89734E+01	1.4357E+01	1.0858E+04	4.1281E+00	0.000E+00	1.313E+00
9.987612E-01	2.11535E+01	1.3340E+01	9.5367E+03	4.1893E+00	0.000E+00	1.241E+00
1.067676E+00	2.27846E+01	1.2182E+01	8.1473E+03	4.2504E+00	0.000E+00	1.161E+00
1.141345E+00	2.39382E+01	1.1109E+01	6.9499E+03	4.2987E+00	0.000E+00	1.086E+00
1.220098E+00	2.48005E+01	1.0116E+01	5.9199E+03	4.3338E+00	0.000E+00	1.016E+00
1.304285E+00	2.54732E+01	9.2078E+00	5.0408E+03	4.3556E+00	0.000E+00	9.506E-01
1.391281E+00	2.59977E+01	8.3151E+00	4.2583E+03	4.3640E+00	0.000E+00	8.892E-01
1.490486E+00	2.63628E+01	7.4892E+00	3.5878E+03	4.3592E+00	0.000E+00	8.318E-01
1.593329E+00	2.66227E+01	6.7415E+00	3.0211E+03	4.3414E+00	0.000E+00	7.781E-01
1.703269E+00	2.67981E+01	6.0602E+00	2.5405E+03	4.3107E+00	0.000E+00	7.279E-01
1.820795E+00	2.69098E+01	5.4480E+00	2.1365E+03	4.2678E+00	0.000E+00	6.809E-01
1.946430E+00	2.69744E+01	4.8978E+00	1.7967E+03	4.2132E+00	0.000E+00	6.370E-01
2.080733E+00	2.70031E+01	4.4033E+00	1.5111E+03	4.1474E+00	0.000E+00	5.959E-01
2.224304E+00	2.70049E+01	3.9603E+00	1.2713E+03	4.0712E+00	0.000E+00	5.574E-01
2.377781E+00	2.69898E+01	3.5635E+00	1.0701E+03	3.9853E+00	0.000E+00	5.214E-01
2.541848E+00	2.69602E+01	3.2082E+00	9.0121E+02	3.8906E+00	0.000E+00	4.878E-01
2.717235E+00	2.69203E+01	2.8901E+00	7.5947E+02	3.7880E+00	0.000E+00	4.563E-01
2.904724E+00	2.68771E+01	2.6054E+00	6.4046E+02	3.6784E+00	0.000E+00	4.268E-01
3.105150E+00	2.68376E+01	2.3362E+00	5.3720E+02	3.5627E+00	0.000E+00	3.993E-01
3.319406E+00	2.67746E+01	2.0714E+00	4.4557E+02	3.4418E+00	0.000E+00	3.735E-01
3.548445E+00	2.66954E+01	1.8370E+00	3.6965E+02	3.3167E+00	0.000E+00	3.494E-01
3.793288E+00	2.66078E+01	1.6283E+00	3.0651E+02	3.1884E+00	0.000E+00	3.269E-01
4.055024E+00	2.65107E+01	1.4403E+00	2.5361E+02	3.0576E+00	0.000E+00	3.058E-01
4.334821E+00	2.64054E+01	1.2751E+00	2.1004E+02	2.9253E+00	0.000E+00	2.860E-01
4.633924E+00	2.62922E+01	1.1300E+00	1.7412E+02	2.7924E+00	0.000E+00	2.676E-01

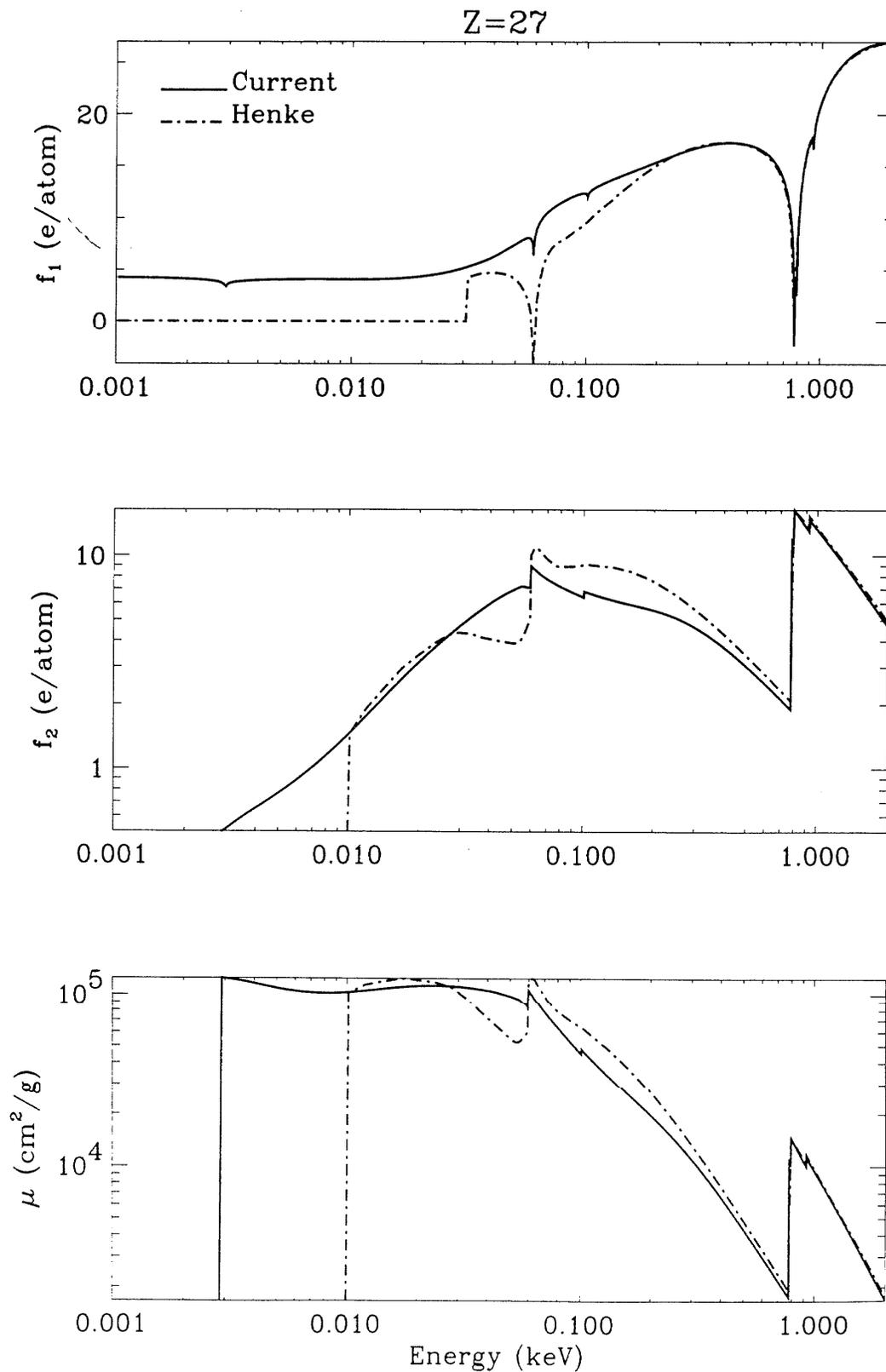
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 229

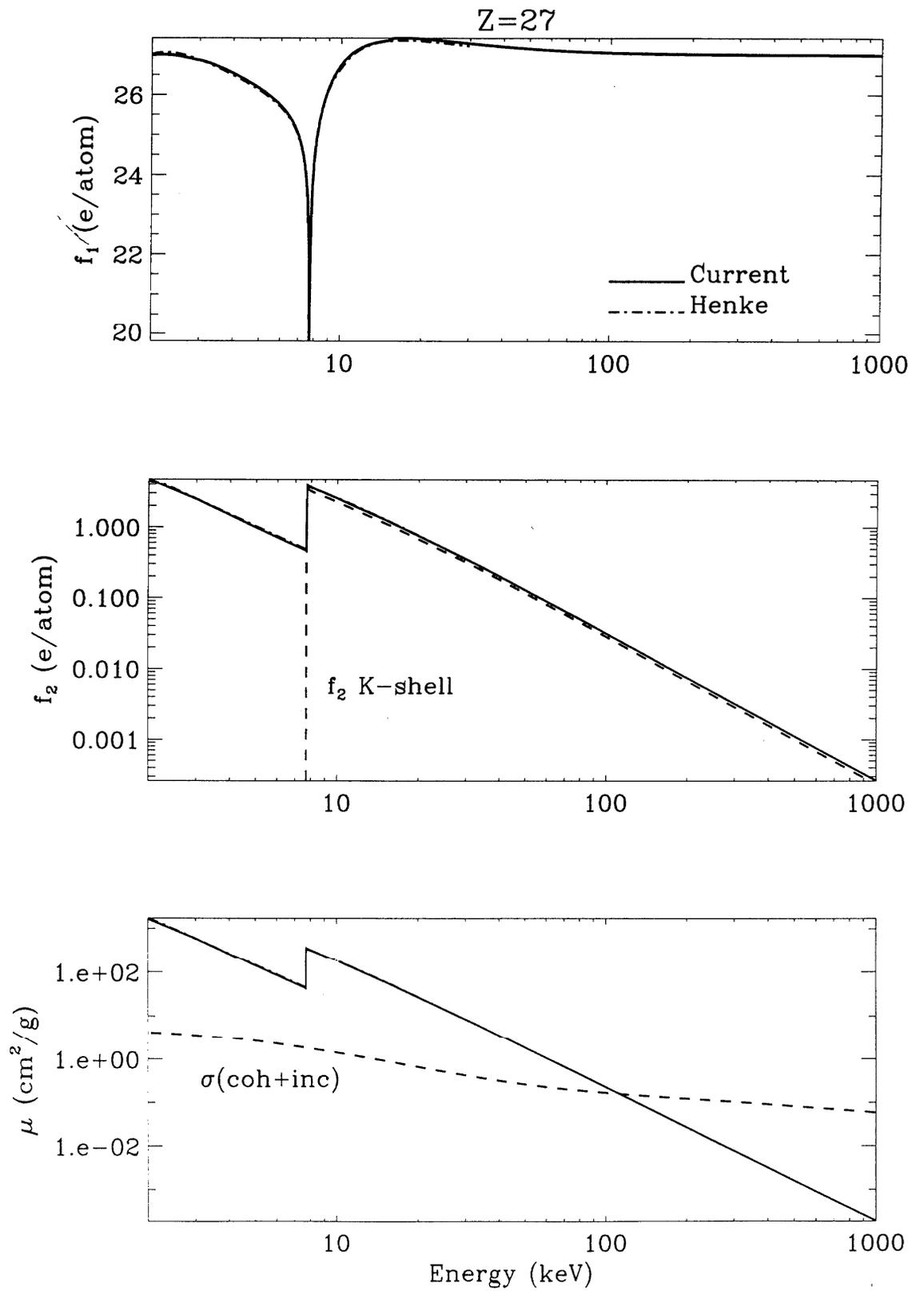
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.953664E+00	2.61697E+01	1.0023E+00	1.4448E+02	2.6595E+00	0.000E+00	2.503E-01
5.295467E+00	2.60338E+01	8.8996E-01	1.2000E+02	2.5274E+00	0.000E+00	2.341E-01
5.660855E+00	2.58774E+01	7.9093E-01	9.9765E+01	2.3967E+00	0.000E+00	2.190E-01
6.051453E+00	2.56869E+01	7.0360E-01	8.3020E+01	2.2682E+00	0.000E+00	2.049E-01
6.469004E+00	2.54337E+01	6.2651E-01	6.9152E+01	2.1423E+00	0.000E+00	1.917E-01
6.915365E+00	2.50440E+01	5.5839E-01	5.7656E+01	2.0195E+00	0.000E+00	1.793E-01
7.392525E+00	2.41983E+01	4.9816E-01	4.8116E+01	1.9002E+00	0.000E+00	1.677E-01
7.554722E+00	2.34922E+01	4.8010E-01	4.5376E+01	1.8623E+00	0.000E+00	1.641E-01
7.670355E+00	2.20515E+01	4.6787E-01	4.3554E+01	1.8360E+00	0.000E+00	1.616E-01
7.701191E+00	2.03118E+01	4.6470E-01	4.3086E+01	1.8290E+00	0.000E+00	1.610E-01
7.747444E+00	2.20899E+01	3.8913E+00	3.5864E+02	1.8187E+00	3.162E+02	1.600E-01
7.863078E+00	2.36980E+01	3.7792E+00	3.4319E+02	1.7934E+00	3.024E+02	1.577E-01
7.902609E+00	2.39681E+01	3.7420E+00	3.3811E+02	1.7849E+00	2.979E+02	1.569E-01
8.447890E+00	2.55247E+01	3.3364E+00	2.8200E+02	1.6738E+00	2.484E+02	1.468E-01
9.030794E+00	2.61889E+01	3.0147E+00	2.3837E+02	1.5671E+00	2.104E+02	1.373E-01
9.653919E+00	2.65956E+01	2.7028E+00	1.9990E+02	1.4650E+00	1.769E+02	1.284E-01
1.032004E+01	2.68641E+01	2.4149E+00	1.6708E+02	1.3677E+00	1.481E+02	1.201E-01
1.103212E+01	2.70436E+01	2.1541E+00	1.3942E+02	1.2753E+00	1.238E+02	1.124E-01
1.179334E+01	2.71663E+01	1.9216E+00	1.1635E+02	1.1877E+00	1.034E+02	1.051E-01
1.260708E+01	2.72503E+01	1.7145E+00	9.7104E+01	1.1050E+00	8.645E+01	9.834E-02
1.341691E+01	2.73072E+01	1.5298E+00	8.1052E+01	1.0272E+00	7.225E+01	9.200E-02
1.440688E+01	2.73449E+01	1.3652E+00	6.7660E+01	9.5414E-01	6.038E+01	8.606E-02
1.540095E+01	2.73695E+01	1.2182E+00	5.6477E+01	8.8576E-01	5.046E+01	8.050E-02
1.646362E+01	2.74194E+01	1.0783E+00	4.6767E+01	8.2193E-01	4.180E+01	7.531E-02
1.759961E+01	2.74188E+01	9.5438E-01	3.8720E+01	7.6249E-01	3.462E+01	7.045E-02
1.881398E+01	2.74105E+01	8.4426E-01	3.2041E+01	7.0729E-01	2.867E+01	6.590E-02
2.011215E+01	2.73973E+01	7.4690E-01	2.6517E+01	6.5614E-01	2.374E+01	6.165E-02
2.149988E+01	2.73808E+01	6.6081E-01	2.1946E+01	6.0886E-01	1.966E+01	5.767E-02
2.298338E+01	2.73623E+01	5.8469E-01	1.8165E+01	5.6526E-01	1.628E+01	5.395E-02
2.456923E+01	2.73430E+01	5.1737E-01	1.5036E+01	5.2512E-01	1.348E+01	5.046E-02
2.626450E+01	2.73241E+01	4.5783E-01	1.2447E+01	4.8825E-01	1.117E+01	4.721E-02
2.807676E+01	2.73053E+01	4.0326E-01	1.0255E+01	4.5445E-01	9.208E+00	4.416E-02
3.001405E+01	2.72853E+01	3.5466E-01	8.4373E+00	4.2351E-01	7.582E+00	4.131E-02
3.208502E+01	2.72654E+01	3.1194E-01	6.9420E+00	3.9524E-01	6.244E+00	3.864E-02
3.429889E+01	2.72463E+01	2.7377E-01	5.6994E+00	3.6943E-01	5.129E+00	3.615E-02
3.666551E+01	2.72274E+01	2.3948E-01	4.6638E+00	3.4592E-01	4.198E+00	3.381E-02
3.919543E+01	2.72091E+01	2.0950E-01	3.8165E+00	3.2451E-01	3.435E+00	3.163E-02
4.189992E+01	2.71916E+01	1.8327E-01	3.1232E+00	3.0503E-01	2.811E+00	2.959E-02
4.479101E+01	2.71751E+01	1.6034E-01	2.5560E+00	2.8733E-01	2.301E+00	2.768E-02
4.788159E+01	2.71597E+01	1.4027E-01	2.0917E+00	2.7124E-01	1.883E+00	2.589E-02
5.118542E+01	2.71453E+01	1.2271E-01	1.7118E+00	2.5662E-01	1.541E+00	2.422E-02
5.471721E+01	2.71320E+01	1.0735E-01	1.4009E+00	2.4333E-01	1.261E+00	2.266E-02
5.849270E+01	2.71198E+01	9.3920E-02	1.1465E+00	2.3125E-01	1.032E+00	2.120E-02
6.252870E+01	2.71086E+01	8.2171E-02	9.3833E-01	2.2025E-01	8.446E-01	1.983E-02
6.684318E+01	2.70983E+01	7.1894E-02	7.6799E-01	2.1023E-01	6.912E-01	1.855E-02
7.145536E+01	2.70889E+01	6.2904E-02	6.2858E-01	2.0108E-01	5.657E-01	1.735E-02
7.638578E+01	2.70803E+01	5.5040E-02	5.1450E-01	1.9272E-01	4.630E-01	1.623E-02
8.165640E+01	2.70725E+01	4.8079E-02	4.2042E-01	1.8505E-01	3.783E-01	1.518E-02
8.729069E+01	2.70655E+01	4.1842E-02	3.4226E-01	1.7800E-01	3.079E-01	1.420E-02
9.331374E+01	2.70590E+01	3.6414E-02	2.7864E-01	1.7150E-01	2.506E-01	1.329E-02
9.975239E+01	2.70530E+01	3.1691E-02	2.2685E-01	1.6549E-01	2.040E-01	1.243E-02
1.066353E+02	2.70476E+01	2.7581E-02	1.8468E-01	1.5990E-01	1.661E-01	1.163E-02
1.139931E+02	2.70427E+01	2.4005E-02	1.5036E-01	1.5469E-01	1.352E-01	1.088E-02
1.218587E+02	2.70383E+01	2.0892E-02	1.2242E-01	1.4981E-01	1.100E-01	1.017E-02
1.302669E+02	2.70343E+01	1.8184E-02	9.9670E-02	1.4522E-01	8.957E-02	9.518E-03
1.392553E+02	2.70307E+01	1.5826E-02	8.1151E-02	1.4089E-01	7.291E-02	8.903E-03
1.488640E+02	2.70275E+01	1.3775E-02	6.6073E-02	1.3677E-01	5.935E-02	8.329E-03
1.591356E+02	2.70246E+01	1.1990E-02	5.3798E-02	1.3286E-01	4.831E-02	7.791E-03
1.701159E+02	2.70219E+01	1.0436E-02	4.3803E-02	1.2911E-01	3.932E-02	7.288E-03
1.818539E+02	2.70196E+01	9.0837E-03	3.5666E-02	1.2551E-01	3.201E-02	6.818E-03
1.944018E+02	2.70175E+01	7.9067E-03	2.9041E-02	1.2204E-01	2.606E-02	6.378E-03
2.078156E+02	2.70156E+01	6.8823E-03	2.3647E-02	1.1868E-01	2.121E-02	5.966E-03
2.221548E+02	2.70139E+01	5.9908E-03	1.9255E-02	1.1543E-01	1.726E-02	5.581E-03
2.374835E+02	2.70124E+01	5.2147E-03	1.5679E-02	1.1227E-01	1.405E-02	5.221E-03
2.538699E+02	2.70110E+01	4.5393E-03	1.2767E-02	1.0919E-01	1.144E-02	4.884E-03

TABLE 1: Form factors, attenuation and scattering cross-sections. $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.713869E+02	2.70098E+01	3.9514E-03	1.0396E-02	1.0618E-01	9.312E-03	4.569E-03
2.901126E+02	2.70087E+01	3.4396E-03	8.4657E-03	1.0323E-01	7.580E-03	4.274E-03
3.101304E+02	2.70078E+01	2.9942E-03	6.8937E-03	1.0035E-01	6.170E-03	3.998E-03
3.315294E+02	2.70069E+01	2.6065E-03	5.6137E-03	9.7526E-02	5.022E-03	3.740E-03
3.544049E+02	2.70061E+01	2.2690E-03	4.5714E-03	9.4754E-02	4.088E-03	3.498E-03
3.788588E+02	2.70055E+01	1.9752E-03	3.7226E-03	9.2033E-02	3.328E-03	3.273E-03
4.050001E+02	2.70049E+01	1.7195E-03	3.0315E-03	8.9361E-02	2.709E-03	3.061E-03
4.329451E+02	2.70043E+01	1.4969E-03	2.4687E-03	8.6737E-02	2.205E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 233

Ni Z = 28

Atomic weight = 5.869000E+01 g/mol, nominal density ρ (g/cm³) = 8.8760E+00

μ_{rel} (harns/atom) = μ (cm²/g) \times 9.74571E+01, E (eV) μ (cm²/g) = f_2 (e/atom) \times 7.16993E+05

γ edges. Edge energies (keV):

K	8.33280E+00	L	I	1.00810E+00	L	II	8.71900E-00	L	III	8.54700E-01	
M	I	1.11800E-00	M	II	6.81000E-02	M	III	6.81000E-02	M	IV	3.60000E-03
M	V	3.60000E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.2883E-01, -8.1000E-02 e/atom

Nuclear Thomson correction f_{NT} = -7.3281E-03 e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	3.57659E+00	1.4343E+00	9.6199E+04	1.2091E-04	0.000E+00	1.160E+02
1.142761E-02	3.57599E+00	1.5448E+00	9.6924E+04	1.6602E-04	0.000E+00	1.085E+02
1.221612E-02	3.57095E+00	1.6670E+00	9.7839E+04	2.2668E-04	0.000E+00	1.015E+02
1.305903E-02	3.56836E+00	1.8017E+00	9.8922E+04	3.0780E-04	0.000E+00	9.494E+01
1.396010E-02	3.56968E+00	1.9500E+00	1.0015E+05	4.1563E-04	0.000E+00	8.881E+01
1.492335E-02	3.57685E+00	2.1125E+00	1.0149E+05	5.5816E-04	0.000E+00	8.308E+01
1.595306E-02	3.59151E+00	2.2884E+00	1.0285E+05	7.4546E-04	0.000E+00	7.772E+01
1.705382E-02	3.61476E+00	2.4778E+00	1.0418E+05	9.9023E-04	0.000E+00	7.270E+01
1.823053E-02	3.64791E+00	2.6808E+00	1.0544E+05	1.3083E-03	0.000E+00	6.801E+01
1.948844E-02	3.69236E+00	2.8974E+00	1.0660E+05	1.7192E-03	0.000E+00	6.362E+01
2.083314E-02	3.74958E+00	3.1272E+00	1.0762E+05	2.2473E-03	0.000E+00	5.951E+01
2.227063E-02	3.82103E+00	3.3699E+00	1.0849E+05	2.9219E-03	0.000E+00	5.567E+01
2.380730E-02	3.90818E+00	3.6250E+00	1.0917E+05	3.7792E-03	0.000E+00	5.208E+01
2.545001E-02	4.01245E+00	3.8920E+00	1.0965E+05	4.8626E-03	0.000E+00	4.872E+01
2.720606E-02	4.13521E+00	4.1699E+00	1.0990E+05	6.2241E-03	0.000E+00	4.557E+01
2.908327E-02	4.27778E+00	4.4581E+00	1.0991E+05	7.9258E-03	0.000E+00	4.263E+01
3.109002E-02	4.44144E+00	4.7557E+00	1.0967E+05	1.0041E-02	0.000E+00	3.988E+01
3.323523E-02	4.62739E+00	5.0616E+00	1.0920E+05	1.2657E-02	0.000E+00	3.731E+01
3.552846E-02	4.83686E+00	5.3751E+00	1.0847E+05	1.5873E-02	0.000E+00	3.490E+01
3.797993E-02	5.07105E+00	5.6954E+00	1.0752E+05	1.9807E-02	0.000E+00	3.264E+01
4.060054E-02	5.33124E+00	6.0216E+00	1.0634E+05	2.4594E-02	0.000E+00	3.054E+01
4.340198E-02	5.61884E+00	6.3532E+00	1.0495E+05	3.0386E-02	0.000E+00	2.857E+01
4.639671E-02	5.93534E+00	6.6897E+00	1.0338E+05	3.7359E-02	0.000E+00	2.672E+01
4.959809E-02	6.28228E+00	7.0309E+00	1.0164E+05	4.5708E-02	0.000E+00	2.500E+01
5.302035E-02	6.72188E+00	7.3516E+00	9.9415E+04	5.5654E-02	0.000E+00	2.338E+01
5.667876E-02	7.16643E+00	7.6429E+00	9.6684E+04	6.7438E-02	0.000E+00	2.187E+01
6.058959E-02	7.58919E+00	7.9225E+00	9.3751E+04	8.1328E-02	0.000E+00	2.046E+01
6.477028E-02	7.9984E+00	8.1889E+00	9.0650E+04	9.7617E-02	0.000E+00	1.914E+01
6.673800E-02	7.81083E+00	8.3039E+00	8.9212E+04	1.0578E-01	0.000E+00	1.858E+01
6.775950E-02	7.29248E+00	8.3483E+00	8.8337E+04	1.1015E-01	0.000E+00	1.830E+01
6.803190E-02	6.49266E+00	8.3411E+00	8.7907E+04	1.1133E-01	0.000E+00	1.822E+01
6.844050E-02	7.47679E+00	1.0005E+01	1.0481E+05	1.1310E-01	0.000E+00	1.812E+01
6.923942E-02	8.30426E+00	9.9197E+00	1.0272E+05	1.1662E-01	0.000E+00	1.791E+01
6.946200E-02	8.44458E+00	9.8964E+00	1.0215E+05	1.1761E-01	0.000E+00	1.785E+01
7.401695E-02	9.92898E+00	9.4522E+00	9.1562E+04	1.3867E-01	0.000E+00	1.675E+01
7.912411E-02	1.07677E+01	9.0420E+00	8.1936E+04	1.6413E-01	0.000E+00	1.567E+01
8.458368E-02	1.13913E+01	8.7086E+00	7.3820E+04	1.9337E-01	0.000E+00	1.466E+01
9.041995E-02	1.19094E+01	8.4128E+00	6.6710E+04	2.2678E-01	0.000E+00	1.371E+01
9.665893E-02	1.23487E+01	8.1362E+00	6.0352E+04	2.6477E-01	0.000E+00	1.283E+01
1.033284E-01	1.27032E+01	7.8715E+00	5.4620E+04	3.0774E-01	0.000E+00	1.200E+01
1.095640E-01	1.28584E+01	7.5469E+00	5.0042E+04	3.4990E-01	0.000E+00	1.132E+01
1.104581E-01	1.28304E+01	7.6164E+00	4.9438E+04	3.5609E-01	0.000E+00	1.122E+01
1.112410E-01	1.27438E+01	7.5899E+00	4.8920E+04	3.6154E-01	0.000E+00	1.115E+01
1.116882E-01	1.25364E+01	7.5749E+00	4.8628E+04	3.6466E-01	0.000E+00	1.110E+01
1.123590E-01	1.27940E+01	7.9994E+00	5.1047E+04	3.6937E-01	0.000E+00	1.103E+01
1.140360E-01	1.30669E+01	7.9514E+00	4.9994E+04	3.8120E-01	0.000E+00	1.087E+01
1.180797E-01	1.33934E+01	7.8409E+00	4.7611E+04	4.1022E-01	0.000E+00	1.050E+01
1.262272E-01	1.38459E+01	7.6390E+00	4.3391E+04	4.7051E-01	0.000E+00	9.822E+00
1.349368E-01	1.42329E+01	7.4472E+00	3.9571E+04	5.3731E-01	0.000E+00	9.188E+00
1.442475E-01	1.45869E+01	7.2647E+00	3.6110E+04	6.1096E-01	0.000E+00	8.595E+00
1.542005E-01	1.49196E+01	7.0911E+00	3.2972E+04	6.9174E-01	0.000E+00	8.040E+00
1.648404E-01	1.52378E+01	6.9250E+00	3.0121E+04	7.7988E-01	0.000E+00	7.521E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.762144E-01	1.55459E+01	6.7644E+00	2.7523E+04	8.7556E-01	0.000E+00	7.036E+00
1.883732E-01	1.58466E+01	6.6064E+00	2.5145E+04	9.7888E-01	0.000E+00	6.582E+00
2.013709E-01	1.61413E+01	6.4480E+00	2.2958E+04	1.0899E+00	0.000E+00	6.157E+00
2.152655E-01	1.64384E+01	6.2862E+00	2.0938E+04	1.2085E+00	0.000E+00	5.760E+00
2.301188E-01	1.67200E+01	6.1183E+00	1.9063E+04	1.3346E+00	0.000E+00	5.388E+00
2.459970E-01	1.69927E+01	5.9420E+00	1.7319E+04	1.4678E+00	0.000E+00	5.040E+00
2.629708E-01	1.72537E+01	5.7560E+00	1.5694E+04	1.6080E+00	0.000E+00	4.715E+00
2.811158E-01	1.75008E+01	5.5592E+00	1.4179E+04	1.7546E+00	0.000E+00	4.410E+00
3.005128E-01	1.77292E+01	5.3486E+00	1.2761E+04	1.9070E+00	0.000E+00	4.126E+00
3.212482E-01	1.79330E+01	5.1254E+00	1.1439E+04	2.0646E+00	0.000E+00	3.859E+00
3.434143E-01	1.81062E+01	4.8924E+00	1.0215E+04	2.2267E+00	0.000E+00	3.610E+00
3.671099E-01	1.82471E+01	4.6526E+00	9.0869E+03	2.3923E+00	0.000E+00	3.377E+00
3.924405E-01	1.83508E+01	4.4092E+00	8.0556E+03	2.5605E+00	0.000E+00	3.159E+00
4.195189E-01	1.84135E+01	4.1650E+00	7.1184E+03	2.7302E+00	0.000E+00	2.955E+00
4.484657E-01	1.84310E+01	3.9230E+00	6.2720E+03	2.9004E+00	0.000E+00	2.765E+00
4.794098E-01	1.83977E+01	3.6854E+00	5.5117E+03	3.0699E+00	0.000E+00	2.586E+00
5.124891E-01	1.83055E+01	3.4539E+00	4.8322E+03	3.2375E+00	0.000E+00	2.419E+00
5.478508E-01	1.81427E+01	3.2304E+00	4.2278E+03	3.4019E+00	0.000E+00	2.263E+00
5.856525E-01	1.78905E+01	3.0161E+00	3.6924E+03	3.5620E+00	0.000E+00	2.117E+00
6.260625E-01	1.75178E+01	2.8117E+00	3.2201E+03	3.7163E+00	0.000E+00	1.980E+00
6.692609E-01	1.69681E+01	2.6180E+00	2.8047E+03	3.8638E+00	0.000E+00	1.853E+00
7.154399E-01	1.61269E+01	2.4352E+00	2.4404E+03	4.0033E+00	0.000E+00	1.733E+00
7.648052E-01	1.47079E+01	2.2632E+00	2.1217E+03	4.1336E+00	0.000E+00	1.621E+00
8.175768E-01	1.15821E+01	2.1021E+00	1.8435E+03	4.2536E+00	0.000E+00	1.516E+00
8.376060E-01	8.76961E+00	2.0462E+00	1.7516E+03	4.2944E+00	0.000E+00	1.480E+00
8.504265E-01	3.93819E+00	2.0119E+00	1.6962E+03	4.3193E+00	0.000E+00	1.458E+00
8.544620E-01	-5.44705E+00	2.0013E+00	1.6793E+03	4.3269E+00	0.000E+00	1.451E+00
8.589735E-01	3.45285E+00	1.1918E+01	9.9479E+03	4.3353E+00	0.000E+00	1.443E+00
8.675405E-01	5.48784E+00	1.1735E+01	9.6987E+03	4.3510E+00	0.000E+00	1.429E+00
8.710281E-01	3.82284E+00	1.1662E+01	9.5998E+03	4.3572E+00	0.000E+00	1.423E+00
8.717940E-01	6.87490E-01	1.1646E+01	9.5782E+03	4.3586E+00	0.000E+00	1.422E+00
8.739896E-01	5.80960E+00	1.6508E+01	1.3543E+04	4.3625E+00	0.000E+00	1.419E+00
8.762595E-01	7.36968E+00	1.6442E+01	1.3453E+04	4.3665E+00	0.000E+00	1.415E+00
8.893380E-01	1.12789E+01	1.6066E+01	1.2953E+04	4.3889E+00	0.000E+00	1.394E+00
9.342948E-01	1.62345E+01	1.4877E+01	1.1417E+04	4.4592E+00	0.000E+00	1.327E+00
9.879380E-01	1.84258E+01	1.3649E+01	9.9055E+03	4.5304E+00	0.000E+00	1.255E+00
9.987612E-01	1.84133E+01	1.3424E+01	9.6365E+03	4.5432E+00	0.000E+00	1.241E+00
1.003060E+00	1.82231E+01	1.3334E+01	9.5315E+03	4.5482E+00	0.000E+00	1.236E+00
1.007092E+00	1.74472E+01	1.3251E+01	9.4340E+03	4.5527E+00	0.000E+00	1.231E+00
1.013141E+00	1.85689E+01	1.4933E+01	1.0568E+04	4.5595E+00	0.000E+00	1.224E+00
1.028262E+00	1.98654E+01	1.4615E+01	1.0191E+04	4.5757E+00	0.000E+00	1.206E+00
1.067676E+00	2.15374E+01	1.3841E+01	9.2950E+03	4.6138E+00	0.000E+00	1.161E+00
1.141345E+00	2.33736E+01	1.2599E+01	7.9145E+03	4.6703E+00	0.000E+00	1.086E+00
1.220098E+00	2.46251E+01	1.1485E+01	6.7491E+03	4.7126E+00	0.000E+00	1.016E+00
1.304285E+00	2.55591E+01	1.0475E+01	5.7585E+03	4.7404E+00	0.000E+00	9.506E-01
1.394281E+00	2.62818E+01	9.5264E+00	4.8988E+03	4.7536E+00	0.000E+00	8.892E-01
1.490486E+00	2.68506E+01	8.6323E+00	4.1525E+03	4.7522E+00	0.000E+00	8.318E-01
1.593329E+00	2.72544E+01	7.7753E+00	3.4989E+03	4.7364E+00	0.000E+00	7.781E-01
1.703269E+00	2.75358E+01	7.0012E+00	2.9472E+03	4.7066E+00	0.000E+00	7.279E-01
1.820795E+00	2.77300E+01	6.3039E+00	2.4824E+03	4.6632E+00	0.000E+00	6.809E-01
1.946430E+00	2.78603E+01	5.6777E+00	2.0914E+03	4.6068E+00	0.000E+00	6.370E-01
2.080733E+00	2.79855E+01	5.1095E+00	1.7607E+03	4.5380E+00	0.000E+00	5.959E-01
2.224304E+00	2.80289E+01	4.5920E+00	1.4802E+03	4.4576E+00	0.000E+00	5.574E-01
2.377781E+00	2.80405E+01	4.1285E+00	1.2449E+03	4.3664E+00	0.000E+00	5.214E-01
2.541848E+00	2.80299E+01	3.7138E+00	1.0476E+03	4.2654E+00	0.000E+00	4.878E-01
2.717235E+00	2.80016E+01	3.3430E+00	8.8212E+02	4.1554E+00	0.000E+00	4.563E-01
2.904724E+00	2.79659E+01	3.0114E+00	7.4334E+02	4.0374E+00	0.000E+00	4.268E-01
3.105150E+00	2.79386E+01	2.6981E+00	6.2301E+02	3.9126E+00	0.000E+00	3.993E-01
3.319406E+00	2.78847E+01	2.4055E+00	5.1958E+02	3.7819E+00	0.000E+00	3.735E-01
3.548445E+00	2.78165E+01	2.1392E+00	4.3225E+02	3.6463E+00	0.000E+00	3.494E-01
3.793288E+00	2.77340E+01	1.8970E+00	3.5857E+02	3.5068E+00	0.000E+00	3.269E-01
4.055024E+00	2.76425E+01	1.6844E+00	2.9783E+02	3.3645E+00	0.000E+00	3.058E-01
4.334821E+00	2.75458E+01	1.4976E+00	2.4771E+02	3.2203E+00	0.000E+00	2.860E-01
4.633924E+00	2.74435E+01	1.3269E+00	2.0531E+02	3.0752E+00	0.000E+00	2.676E-01
4.953664E+00	2.73322E+01	1.1761E+00	1.7023E+02	2.9299E+00	0.000E+00	2.503E-01

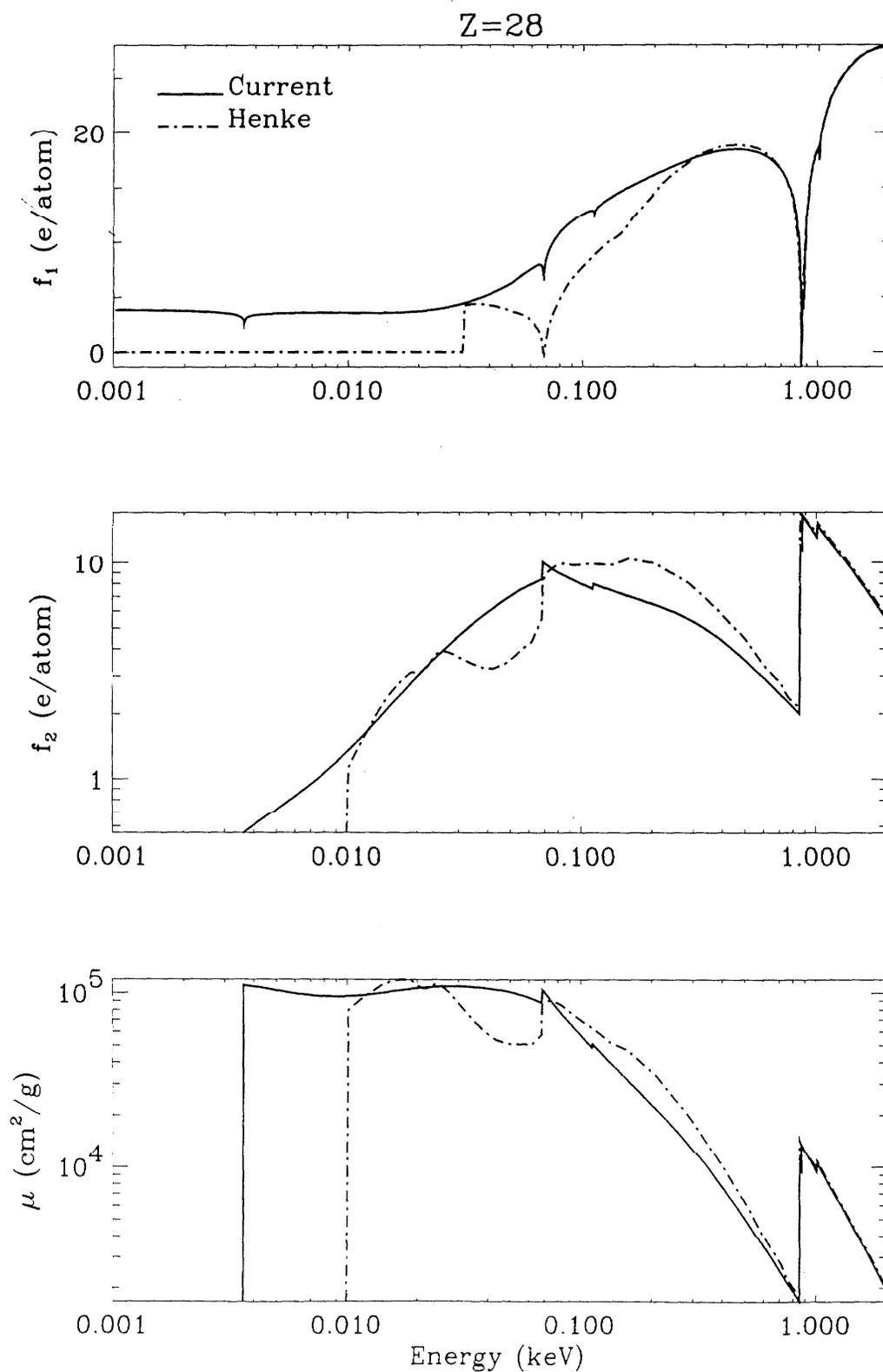
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 235

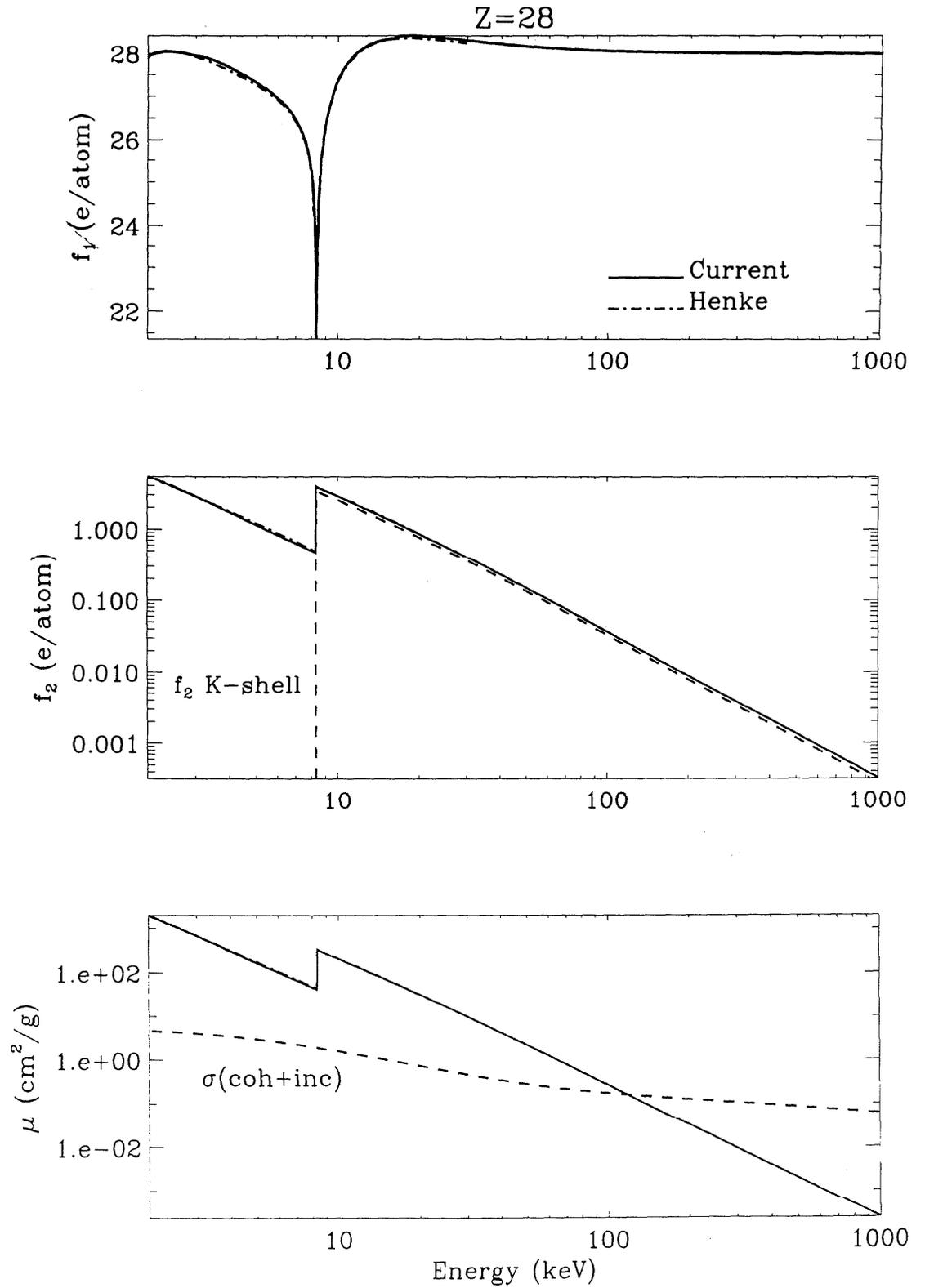
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
5.295467E+00	2.72114E+01	1.0433E+00	1.4127E+02	2.7853E+00	0.000E+00	2.341E-01
5.660855E+00	2.70779E+01	9.2645E-01	1.1734E+02	2.6421E+00	0.000E+00	2.190E-01
6.051453E+00	2.69254E+01	8.2342E-01	9.7561E+01	2.5011E+00	0.000E+00	2.049E-01
6.469004E+00	2.67418E+01	7.3254E-01	8.1191E+01	2.3628E+00	0.000E+00	1.917E-01
6.915365E+00	2.65023E+01	6.5229E-01	6.7631E+01	2.2278E+00	0.000E+00	1.793E-01
7.392525E+00	2.61454E+01	5.8138E-01	5.6388E+01	2.0966E+00	0.000E+00	1.677E-01
7.902609E+00	2.54382E+01	5.1866E-01	4.7057E+01	1.9696E+00	0.000E+00	1.569E-01
8.166144E+00	2.45187E+01	4.9051E-01	4.3068E+01	1.9088E+00	0.000E+00	1.518E-01
8.291136E+00	2.30862E+01	4.7804E-01	4.1340E+01	1.8810E+00	0.000E+00	1.495E-01
8.324467E+00	2.13577E+01	4.7480E-01	4.0895E+01	1.8737E+00	0.000E+00	1.489E-01
8.374464E+00	2.31229E+01	3.8783E+00	3.3205E+02	1.8628E+00	2.918E+02	1.481E-01
8.447890E+00	2.42866E+01	3.8127E+00	3.2360E+02	1.8471E+00	2.843E+02	1.468E-01
8.499456E+00	2.47181E+01	3.7677E+00	3.1783E+02	1.8361E+00	2.792E+02	1.459E-01
9.030794E+00	2.63786E+01	3.4017E+00	2.7007E+02	1.7294E+00	2.373E+02	1.373E-01
9.653919E+00	2.71216E+01	3.0709E+00	2.2808E+02	1.6167E+00	2.012E+02	1.284E-01
1.032004E+01	2.75654E+01	2.7492E+00	1.9101E+02	1.5092E+00	1.689E+02	1.201E-01
1.103212E+01	2.78453E+01	2.4485E+00	1.5913E+02	1.4070E+00	1.409E+02	1.124E-01
1.179334E+01	2.80311E+01	2.1838E+00	1.3276E+02	1.3101E+00	1.178E+02	1.051E-01
1.260708E+01	2.81583E+01	1.9478E+00	1.1078E+02	1.2186E+00	9.840E+01	9.840E-02
1.347697E+01	2.82454E+01	1.7376E+00	9.2441E+01	1.1324E+00	8.223E+01	9.200E-02
1.440688E+01	2.83043E+01	1.5502E+00	7.7148E+01	1.0514E+00	6.871E+01	8.606E-02
1.540095E+01	2.83432E+01	1.3831E+00	6.4391E+01	9.7562E-01	5.742E+01	8.050E-02
1.646362E+01	2.83682E+01	1.2341E+00	5.3744E+01	9.0480E-01	4.798E+01	7.531E-02
1.759961E+01	2.84192E+01	1.0942E+00	4.4579E+01	8.3887E-01	3.982E+01	7.045E-02
1.881398E+01	2.84194E+01	9.6902E-01	3.6929E+01	7.7752E-01	3.299E+01	6.590E-02
2.011215E+01	2.84120E+01	8.5820E-01	3.0595E+01	7.2069E-01	2.734E+01	6.165E-02
2.149988E+01	2.83996E+01	7.6013E-01	2.5349E+01	6.6814E-01	2.265E+01	5.767E-02
2.298338E+01	2.83839E+01	6.7282E-01	2.0989E+01	6.1965E-01	1.877E+01	5.395E-02
2.456923E+01	2.83663E+01	5.9559E-01	1.7381E+01	5.7501E-01	1.555E+01	5.046E-02
2.626450E+01	2.83479E+01	5.2725E-01	1.4393E+01	5.3399E-01	1.289E+01	4.721E-02
2.807676E+01	2.83290E+01	4.6461E-01	1.1865E+01	4.9636E-01	1.063E+01	4.416E-02
3.001405E+01	2.83086E+01	4.0881E-01	9.7658E+00	4.6192E-01	8.759E+00	4.131E-02
3.208502E+01	2.82880E+01	3.5972E-01	8.0386E+00	4.3043E-01	7.216E+00	3.864E-02
3.429889E+01	2.82678E+01	3.1655E-01	6.6173E+00	4.0170E-01	5.945E+00	3.615E-02
3.666551E+01	2.82484E+01	2.7821E-01	5.4404E+00	3.7551E-01	4.891E+00	3.381E-02
3.919543E+01	2.82295E+01	2.4347E-01	4.4537E+00	3.5166E-01	4.004E+00	3.163E-02
4.18992E+01	2.82110E+01	2.1307E-01	3.6460E+00	3.2997E-01	3.279E+00	2.959E-02
4.479101E+01	2.81934E+01	1.8647E-01	2.9850E+00	3.1025E-01	2.684E+00	2.768E-02
4.788159E+01	2.81768E+01	1.6320E-01	2.4439E+00	2.9234E-01	2.198E+00	2.589E-02
5.118542E+01	2.81613E+01	1.4284E-01	2.0009E+00	2.7607E-01	1.799E+00	2.422E-02
5.471721E+01	2.81468E+01	1.2502E-01	1.6382E+00	2.6128E-01	1.473E+00	2.266E-02
5.849270E+01	2.81334E+01	1.0943E-01	1.3413E+00	2.4785E-01	1.206E+00	2.120E-02
6.252870E+01	2.81211E+01	9.5778E-02	1.0983E+00	2.3563E-01	9.873E-01	1.983E-02
6.684318E+01	2.81097E+01	8.3836E-02	8.9927E-01	2.2451E-01	8.083E-01	1.855E-02
7.145536E+01	2.80994E+01	7.3385E-02	7.3636E-01	2.1436E-01	6.618E-01	1.735E-02
7.638578E+01	2.80899E+01	6.4239E-02	6.0298E-01	2.0510E-01	5.418E-01	1.623E-02
8.165640E+01	2.80813E+01	5.6155E-02	4.9308E-01	1.9662E-01	4.429E-01	1.518E-02
8.729069E+01	2.80734E+01	4.8934E-02	4.0193E-01	1.8883E-01	3.607E-01	1.420E-02
9.331374E+01	2.80662E+01	4.2642E-02	3.2765E-01	1.8167E-01	2.938E-01	1.329E-02
9.975239E+01	2.80596E+01	3.7161E-02	2.6710E-01	1.7505E-01	2.393E-01	1.243E-02
1.066353E+02	2.80536E+01	3.2385E-02	2.1775E-01	1.6892E-01	1.949E-01	1.163E-02
1.139931E+02	2.80481E+01	2.8224E-02	1.7752E-01	1.6321E-01	1.588E-01	1.088E-02
1.218587E+02	2.80432E+01	2.4598E-02	1.4473E-01	1.5788E-01	1.293E-01	1.017E-02
1.302669E+02	2.80387E+01	2.1438E-02	1.1800E-01	1.5288E-01	1.054E-01	9.518E-03
1.392553E+02	2.80347E+01	1.8685E-02	9.6207E-02	1.4817E-01	8.581E-02	8.903E-03
1.488640E+02	2.80311E+01	1.6286E-02	7.8442E-02	1.4371E-01	6.990E-02	8.329E-03
1.591356E+02	2.80278E+01	1.4196E-02	6.3959E-02	1.3947E-01	5.693E-02	7.791E-03
1.701159E+02	2.80248E+01	1.2374E-02	5.2152E-02	1.3543E-01	4.637E-02	7.288E-03
1.818539E+02	2.80222E+01	1.0786E-02	4.2525E-02	1.3156E-01	3.777E-02	6.818E-03
1.944018E+02	2.80198E+01	9.4020E-03	3.4677E-02	1.2784E-01	3.077E-02	6.378E-03
2.078156E+02	2.80177E+01	8.1960E-03	2.8177E-02	1.2425E-01	2.506E-02	5.966E-03
2.221548E+02	2.80158E+01	7.1448E-03	2.3059E-02	1.2077E-01	2.041E-02	5.581E-03
2.374835E+02	2.80141E+01	6.2286E-03	1.8805E-02	1.1740E-01	1.663E-02	5.221E-03
2.538699E+02	2.80125E+01	5.4300E-03	1.5336E-02	1.1413E-01	1.354E-02	4.884E-03
2.713869E+02	2.80112E+01	4.7339E-03	1.2507E-02	1.1093E-01	1.103E-02	4.569E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.901126E+02	2.80099E+01	4.1272E-03	1.0200E-02	1.0782E-01	8.985E-03	4.274E-03
3.101304E+02	2.80088E+01	3.5983E-03	8.3190E-03	1.0477E-01	7.318E-03	3.998E-03
3.315294E+02	2.80079E+01	3.1373E-03	6.7849E-03	1.0179E-01	5.961E-03	3.740E-03
3.544049E+02	2.80070E+01	2.7354E-03	5.5339E-03	9.8866E-02	4.855E-03	3.498E-03
3.788588E+02	2.80062E+01	2.3850E-03	4.5136E-03	9.6002E-02	3.955E-03	3.273E-03
4.050001E+02	2.80055E+01	2.0796E-03	3.6816E-03	9.3194E-02	3.221E-03	3.061E-03
4.329451E+02	2.80049E+01	1.8133E-03	3.0030E-03	9.0439E-02	2.624E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 239

Cu Z = 29

Atomic weight = 6.354600E+01 g/mol, nominal density ρ (g/cm³) = 8.9400E+00

μ_0 (barns/atom) = μ (cm²/g) \times 1.05521E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 6.62202E+05

ν edges. Edge energies (keV):

K		8.97890E+00	L	I	1.09610E+00	L	II	9.51000E-00	L	III	9.31100E-01
M	I	1.19800E-00	M	II	7.36000E-02	M	III	7.36000E-02	M	IV	1.60000E-03
M	V	1.60000E-03									

Relativistic correction estimate f_{rel} (H82,3/SCL) = -1.4003E-01, -8.7600E-02 e/atom

Nuclear Thomson correction f_{NT} = -7.2602E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	5.11541E+00	2.1733E+00	1.3463E+05	9.3677E-05	0.000E+00	1.160E+02
1.142761E-02	5.16418E+00	2.2889E+00	1.3264E+05	1.2952E-04	0.000E+00	1.085E+02
1.221612E-02	5.21676E+00	2.4126E+00	1.3078E+05	1.7806E-04	0.000E+00	1.015E+02
1.305903E-02	5.27396E+00	2.5449E+00	1.2905E+05	2.4341E-04	0.000E+00	9.494E+01
1.396010E-02	5.33667E+00	2.6864E+00	1.2743E+05	3.3085E-04	0.000E+00	8.881E+01
1.492335E-02	5.40595E+00	2.8374E+00	1.2591E+05	4.4719E-04	0.000E+00	8.308E+01
1.595306E-02	5.48301E+00	2.9985E+00	1.2447E+05	6.0108E-04	0.000E+00	7.772E+01
1.705382E-02	5.56923E+00	3.1701E+00	1.2310E+05	8.0346E-04	0.000E+00	7.270E+01
1.823053E-02	5.66623E+00	3.3525E+00	1.2177E+05	1.0681E-03	0.000E+00	6.801E+01
1.948844E-02	5.77588E+00	3.5460E+00	1.2049E+05	1.4121E-03	0.000E+00	6.362E+01
2.083314E-02	5.90040E+00	3.7507E+00	1.1922E+05	1.8568E-03	0.000E+00	5.951E+01
2.227063E-02	6.04250E+00	3.9669E+00	1.1795E+05	2.4284E-03	0.000E+00	5.567E+01
2.380730E-02	6.20556E+00	4.1946E+00	1.1667E+05	3.1590E-03	0.000E+00	5.208E+01
2.545001E-02	6.39395E+00	4.4336E+00	1.1536E+05	4.0876E-03	0.000E+00	4.872E+01
2.720606E-02	6.61376E+00	4.6837E+00	1.1400E+05	5.2611E-03	0.000E+00	4.557E+01
2.908327E-02	6.87400E+00	4.9447E+00	1.1259E+05	6.7361E-03	0.000E+00	4.263E+01
3.109002E-02	7.18087E+00	5.1429E+00	1.0954E+05	8.5797E-03	0.000E+00	3.988E+01
3.323523E-02	7.48774E+00	5.2695E+00	1.0499E+05	1.0871E-02	0.000E+00	3.731E+01
3.552846E-02	7.79039E+00	5.3892E+00	1.0045E+05	1.3704E-02	0.000E+00	3.490E+01
3.797993E-02	8.09250E+00	5.5005E+00	9.5904E+04	1.7187E-02	0.000E+00	3.264E+01
4.060054E-02	8.39535E+00	5.6019E+00	9.1369E+04	2.1447E-02	0.000E+00	3.054E+01
4.340198E-02	8.69863E+00	5.6922E+00	8.6848E+04	2.6627E-02	0.000E+00	2.857E+01
4.639671E-02	9.00071E+00	5.7698E+00	8.2351E+04	3.2893E-02	0.000E+00	2.672E+01
4.959809E-02	9.29848E+00	5.8335E+00	7.7886E+04	4.0433E-02	0.000E+00	2.500E+01
5.302035E-02	9.58673E+00	5.8821E+00	7.3465E+04	4.9456E-02	0.000E+00	2.338E+01
5.667876E-02	9.85667E+00	5.9145E+00	6.9102E+04	6.0198E-02	0.000E+00	2.187E+01
6.058959E-02	1.00916E+01	5.9298E+00	6.4809E+04	7.2917E-02	0.000E+00	2.046E+01
6.477028E-02	1.02528E+01	5.9273E+00	6.0600E+04	8.7898E-02	0.000E+00	1.914E+01
6.923942E-02	1.02020E+01	5.9066E+00	5.6490E+04	1.0545E-01	0.000E+00	1.791E+01
7.212800E-02	9.67426E+00	5.8847E+00	5.4027E+04	1.1762E-01	0.000E+00	1.719E+01
7.323200E-02	8.64551E+00	5.8748E+00	5.3123E+04	1.2243E-01	0.000E+00	1.693E+01
7.352640E-02	7.25829E+00	5.8721E+00	5.2886E+04	1.2373E-01	0.000E+00	1.686E+01
7.401695E-02	9.01656E+00	8.6666E+00	7.7537E+04	1.2591E-01	0.000E+00	1.675E+01
7.507200E-02	1.03701E+01	8.4419E+00	7.4465E+04	1.3066E-01	0.000E+00	1.652E+01
7.912411E-02	1.18948E+01	7.7340E+00	6.4727E+04	1.4963E-01	0.000E+00	1.567E+01
8.458368E-02	1.25602E+01	7.0931E+00	5.5532E+04	1.7699E-01	0.000E+00	1.466E+01
9.041995E-02	1.29020E+01	6.7123E+00	4.9158E+04	2.0838E-01	0.000E+00	1.371E+01
9.665893E-02	1.31577E+01	6.4597E+00	4.4255E+04	2.4421E-01	0.000E+00	1.283E+01
1.033284E-01	1.33709E+01	6.2728E+00	4.0201E+04	2.8489E-01	0.000E+00	1.200E+01
1.104581E-01	1.35380E+01	6.1234E+00	3.6710E+04	3.3085E-01	0.000E+00	1.122E+01
1.174040E-01	1.35700E+01	6.0085E+00	3.3890E+04	3.7781E-01	0.000E+00	1.056E+01
1.180797E-01	1.35466E+01	5.9985E+00	3.3640E+04	3.8249E-01	0.000E+00	1.050E+01
1.192010E-01	1.34440E+01	5.9824E+00	3.3234E+04	3.9029E-01	0.000E+00	1.040E+01
1.196802E-01	1.32559E+01	5.9757E+00	3.3064E+04	3.9364E-01	0.000E+00	1.036E+01
1.203990E-01	1.34706E+01	6.3567E+00	3.4962E+04	3.9867E-01	0.000E+00	1.030E+01
1.221960E-01	1.36854E+01	6.3407E+00	3.4361E+04	4.1135E-01	0.000E+00	1.015E+01
1.262272E-01	1.39079E+01	6.3091E+00	3.3098E+04	4.4022E-01	0.000E+00	9.822E+00
1.349368E-01	1.42299E+01	6.2577E+00	3.0710E+04	5.0443E-01	0.000E+00	9.188E+00
1.442475E-01	1.45150E+01	6.2188E+00	2.8549E+04	5.7547E-01	0.000E+00	8.595E+00
1.542005E-01	1.47908E+01	6.1892E+00	2.6579E+04	6.5366E-01	0.000E+00	8.040E+00
1.648404E-01	1.50662E+01	6.1667E+00	2.4773E+04	7.3928E-01	0.000E+00	7.521E+00
1.762144E-01	1.53462E+01	6.1485E+00	2.3106E+04	8.3253E-01	0.000E+00	7.036E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.883732E-01	1.56336E+01	6.1310E+00	2.1553E+04	9.3357E-01	0.000E+00	6.582E+00
2.013709E-01	1.59300E+01	6.1101E+00	2.0093E+04	1.0425E+00	0.000E+00	6.157E+00
2.152655E-01	1.62355E+01	6.0812E+00	1.8707E+04	1.1592E+00	0.000E+00	5.760E+00
2.301188E-01	1.65503E+01	6.0398E+00	1.7381E+04	1.2837E+00	0.000E+00	5.388E+00
2.459970E-01	1.68682E+01	5.9821E+00	1.6103E+04	1.4157E+00	0.000E+00	5.040E+00
2.629708E-01	1.71872E+01	5.9048E+00	1.4869E+04	1.5550E+00	0.000E+00	4.715E+00
2.811158E-01	1.75025E+01	5.8057E+00	1.3676E+04	1.7011E+00	0.000E+00	4.410E+00
3.005128E-01	1.78097E+01	5.6839E+00	1.2525E+04	1.8535E+00	0.000E+00	4.126E+00
3.212482E-01	1.81027E+01	5.5360E+00	1.1412E+04	2.0116E+00	0.000E+00	3.859E+00
3.434143E-01	1.83733E+01	5.3635E+00	1.0342E+04	2.1746E+00	0.000E+00	3.610E+00
3.671099E-01	1.86138E+01	5.1699E+00	9.3256E+03	2.3417E+00	0.000E+00	3.377E+00
3.924405E-01	1.88206E+01	4.9596E+00	8.3687E+03	2.5119E+00	0.000E+00	3.159E+00
4.195189E-01	1.89882E+01	4.7369E+00	7.4771E+03	2.6843E+00	0.000E+00	2.955E+00
4.484657E-01	1.91122E+01	4.5063E+00	6.6540E+03	2.8576E+00	0.000E+00	2.765E+00
4.794098E-01	1.91884E+01	4.2718E+00	5.9006E+03	3.0308E+00	0.000E+00	2.586E+00
5.124891E-01	1.92116E+01	4.0367E+00	5.2159E+03	3.2026E+00	0.000E+00	2.419E+00
5.478508E-01	1.91744E+01	3.8040E+00	4.5980E+03	3.3717E+00	0.000E+00	2.263E+00
5.856525E-01	1.90663E+01	3.5762E+00	4.0436E+03	3.5368E+00	0.000E+00	2.117E+00
6.260625E-01	1.88708E+01	3.3552E+00	3.5489E+03	3.6968E+00	0.000E+00	1.980E+00
6.692609E-01	1.85608E+01	3.1426E+00	3.1094E+03	3.8502E+00	0.000E+00	1.853E+00
7.154399E-01	1.80877E+01	2.9393E+00	2.7206E+03	3.9958E+00	0.000E+00	1.733E+00
7.648052E-01	1.73572E+01	2.7122E+00	2.3483E+03	4.1326E+00	0.000E+00	1.621E+00
8.175768E-01	1.61368E+01	2.4939E+00	2.0199E+03	4.2592E+00	0.000E+00	1.516E+00
8.739896E-01	1.36848E+01	2.2948E+00	1.7387E+03	4.3748E+00	0.000E+00	1.419E+00
9.124780E-01	9.41949E+00	2.1756E+00	1.5789E+03	4.4432E+00	0.000E+00	1.359E+00
9.264445E-01	4.24002E+00	2.1352E+00	1.5262E+03	4.4660E+00	0.000E+00	1.338E+00
9.301689E-01	-1.51687E+00	2.1247E+00	1.5126E+03	4.4719E+00	0.000E+00	1.333E+00
9.319800E-01	-1.75592E+00	1.3119E+01	9.3215E+03	4.4748E+00	0.000E+00	1.330E+00
9.342948E-01	2.65894E+00	1.3043E+01	9.2447E+03	4.4784E+00	0.000E+00	1.327E+00
9.357555E-01	3.88406E+00	1.2996E+01	9.1967E+03	4.4807E+00	0.000E+00	1.325E+00
9.462450E-01	6.37000E+00	1.2662E+01	8.8614E+03	4.4967E+00	0.000E+00	1.310E+00
9.500490E-01	4.47663E+00	1.2545E+01	8.7438E+03	4.5024E+00	0.000E+00	1.305E+00
9.557550E-01	8.42374E+00	1.7798E+01	1.2332E+04	4.5108E+00	0.000E+00	1.297E+00
9.700200E-01	1.27452E+01	1.7165E+01	1.1718E+04	4.5311E+00	0.000E+00	1.278E+00
9.987612E-01	1.65330E+01	1.5984E+01	1.0598E+04	4.5691E+00	0.000E+00	1.241E+00
1.067676E+00	1.98679E+01	1.3862E+01	8.5976E+03	4.6463E+00	0.000E+00	1.161E+00
1.074178E+00	1.99670E+01	1.3705E+01	8.4490E+03	4.6527E+00	0.000E+00	1.154E+00
1.090619E+00	1.97917E+01	1.3328E+01	8.0924E+03	4.6680E+00	0.000E+00	1.137E+00
1.095004E+00	1.91176E+01	1.3231E+01	8.0016E+03	4.6719E+00	0.000E+00	1.132E+00
1.101580E+00	2.00415E+01	1.4651E+01	8.8073E+03	4.6777E+00	0.000E+00	1.126E+00
1.118022E+00	2.11255E+01	1.4383E+01	8.5191E+03	4.6914E+00	0.000E+00	1.109E+00
1.141345E+00	2.20250E+01	1.4041E+01	8.1463E+03	4.7094E+00	0.000E+00	1.086E+00
1.220098E+00	2.40494E+01	1.2862E+01	6.9806E+03	4.7580E+00	0.000E+00	1.016E+00
1.304285E+00	2.53950E+01	1.1731E+01	5.9562E+03	4.7917E+00	0.000E+00	9.506E-01
1.394281E+00	2.63665E+01	1.0688E+01	5.0761E+03	4.8105E+00	0.000E+00	8.892E-01
1.490486E+00	2.70949E+01	9.7449E+00	4.3295E+03	4.8144E+00	0.000E+00	8.318E-01
1.593329E+00	2.76981E+01	8.8867E+00	3.6934E+03	4.8034E+00	0.000E+00	7.781E-01
1.703269E+00	2.81525E+01	8.0183E+00	3.1174E+03	4.7780E+00	0.000E+00	7.279E-01
1.820795E+00	2.84670E+01	7.2303E+00	2.6296E+03	4.7384E+00	0.000E+00	6.809E-01
1.946430E+00	2.86884E+01	6.5194E+00	2.2180E+03	4.6853E+00	0.000E+00	6.370E-01
2.080733E+00	2.88419E+01	5.8780E+00	1.8707E+03	4.6193E+00	0.000E+00	5.959E-01
2.224304E+00	2.89864E+01	5.2957E+00	1.5766E+03	4.5411E+00	0.000E+00	5.574E-01
2.377781E+00	2.90462E+01	4.7581E+00	1.3251E+03	4.4516E+00	0.000E+00	5.214E-01
2.541848E+00	2.90690E+01	4.2769E+00	1.1142E+03	4.3517E+00	0.000E+00	4.878E-01
2.717235E+00	2.90677E+01	3.8470E+00	9.3754E+02	4.2424E+00	0.000E+00	4.563E-01
2.904724E+00	2.90575E+01	3.4633E+00	7.8954E+02	4.1246E+00	0.000E+00	4.268E-01
3.105150E+00	2.90457E+01	3.1014E+00	6.6140E+02	3.9994E+00	0.000E+00	3.993E-01
3.319406E+00	2.89922E+01	2.7637E+00	5.5134E+02	3.8678E+00	0.000E+00	3.735E-01
3.548445E+00	2.89262E+01	2.4650E+00	4.6001E+02	3.7310E+00	0.000E+00	3.494E-01
3.793288E+00	2.88535E+01	2.1976E+00	3.8363E+02	3.5899E+00	0.000E+00	3.269E-01
4.055024E+00	2.87704E+01	1.9496E+00	3.1838E+02	3.4456E+00	0.000E+00	3.058E-01
4.334821E+00	2.86782E+01	1.7317E+00	2.6455E+02	3.2992E+00	0.000E+00	2.860E-01
4.633924E+00	2.85808E+01	1.5402E+00	2.2010E+02	3.1514E+00	0.000E+00	2.676E-01
4.953664E+00	2.84790E+01	1.3670E+00	1.8275E+02	3.0033E+00	0.000E+00	2.503E-01
5.295467E+00	2.83686E+01	1.2121E+00	1.5158E+02	2.8557E+00	0.000E+00	2.341E-01

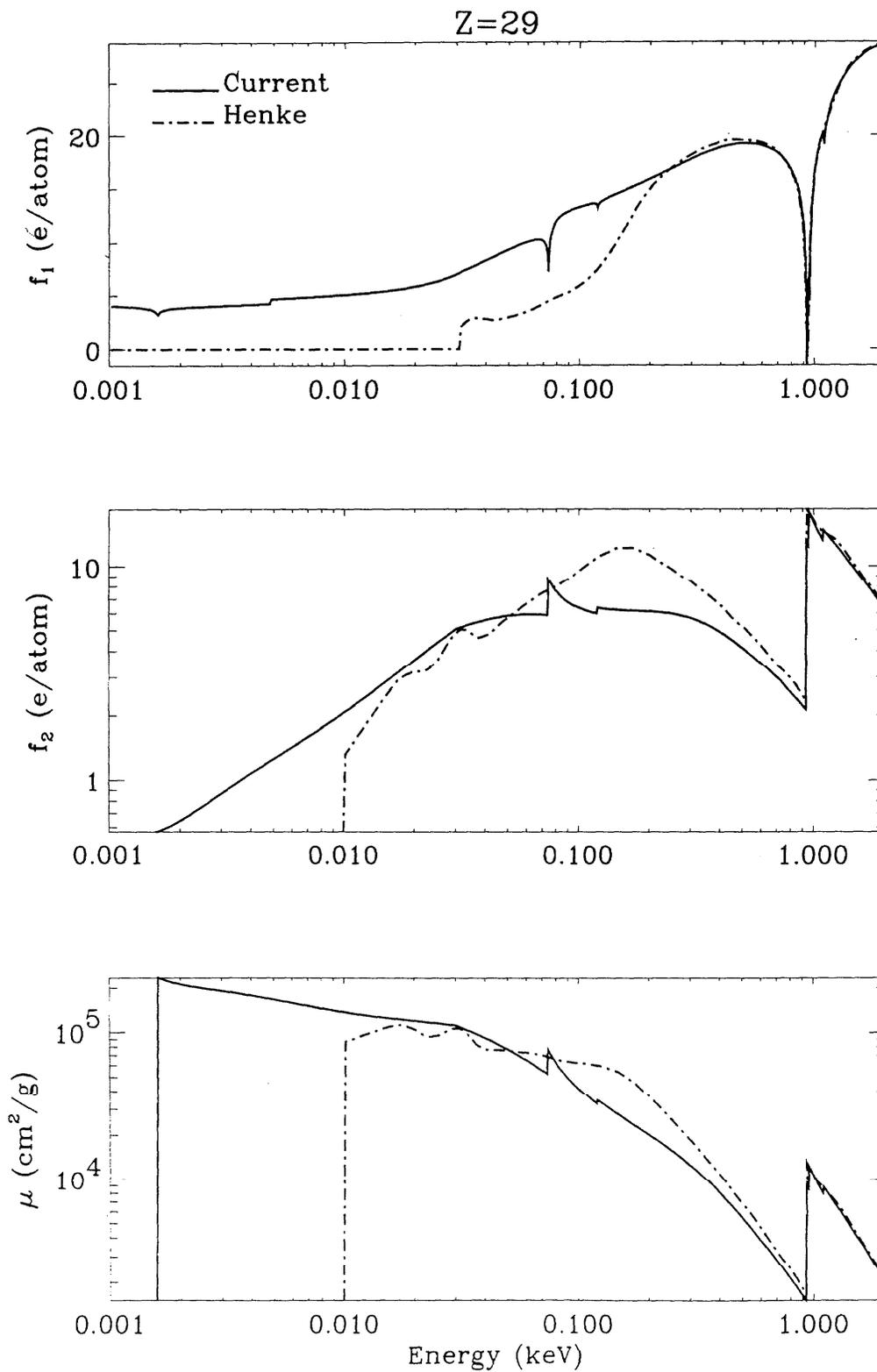
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 241

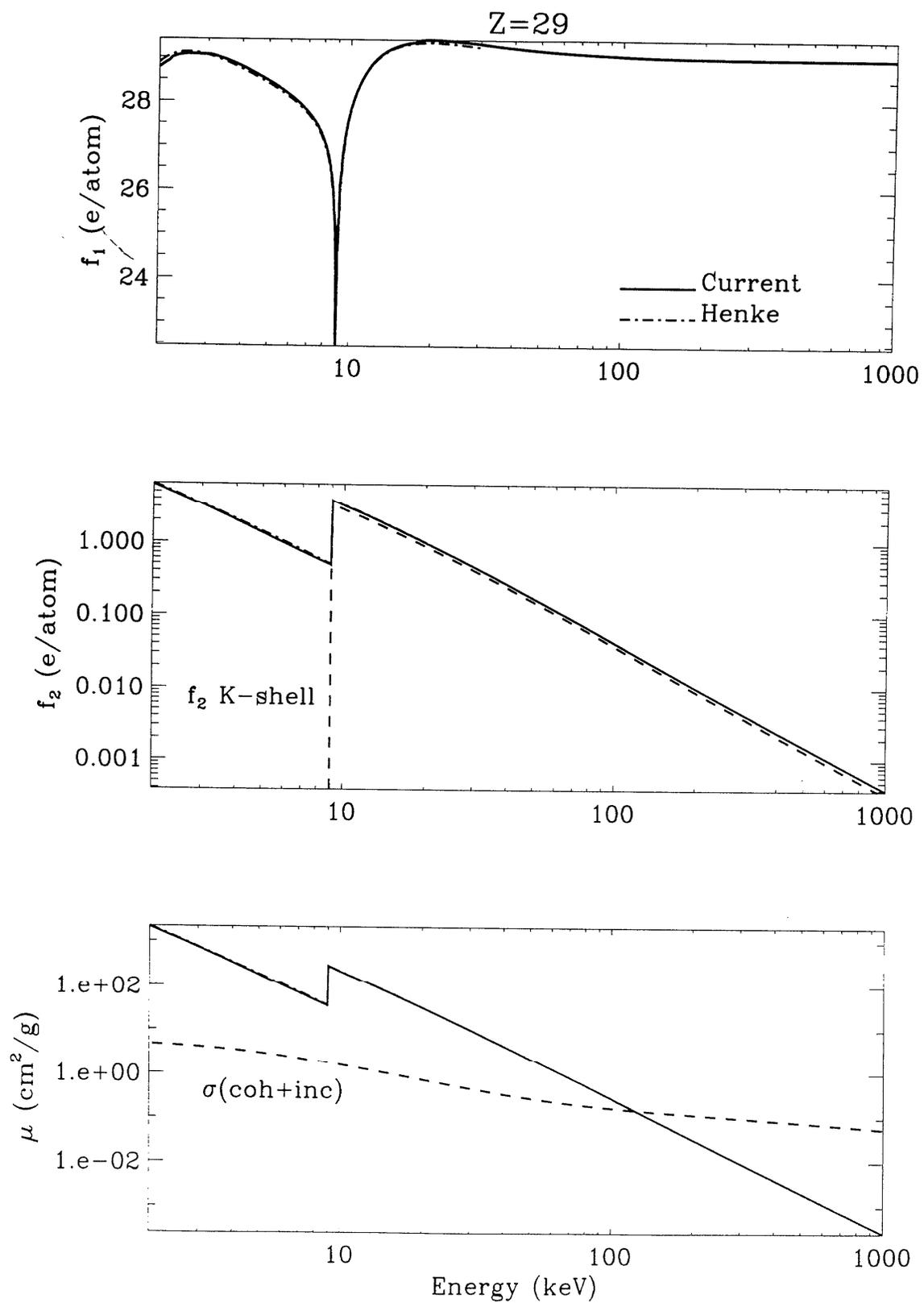
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
5.660855E+00	2.82491E+01	1.0758E+00	1.2584E+02	2.7094E+00	0.000E+00	2.190E-01
6.051453E+00	2.81175E+01	9.5563E-01	1.0457E+02	2.5651E+00	0.000E+00	2.049E-01
6.469004E+00	2.79683E+01	8.4971E-01	8.6981E+01	2.4234E+00	0.000E+00	1.917E-01
6.915365E+00	2.77902E+01	7.5624E-01	7.2416E+01	2.2850E+00	0.000E+00	1.793E-01
7.392525E+00	2.75610E+01	6.7369E-01	6.0347E+01	2.1504E+00	0.000E+00	1.677E-01
7.902609E+00	2.72270E+01	6.0071E-01	5.0336E+01	2.0199E+00	0.000E+00	1.569E-01
8.447890E+00	2.65993E+01	5.3613E-01	4.2025E+01	1.8940E+00	0.000E+00	1.468E-01
8.799322E+00	2.55649E+01	5.0037E-01	3.7656E+01	1.8194E+00	0.000E+00	1.409E-01
8.934005E+00	2.41493E+01	4.8721E-01	3.6113E+01	1.7921E+00	0.000E+00	1.388E-01
8.969921E+00	2.24326E+01	4.8340E-01	3.5687E+01	1.7850E+00	0.000E+00	1.382E-01
9.030794E+00	2.43489E+01	3.8582E+00	2.8291E+02	1.7729E+00	2.479E+02	1.373E-01
9.158478E+00	2.57726E+01	3.7540E+00	2.7143E+02	1.7481E+00	2.379E+02	1.354E-01
9.653919E+00	2.73120E+01	3.4054E+00	2.3359E+02	1.6570E+00	2.048E+02	1.284E-01
1.032004E+01	2.80727E+01	3.0504E+00	1.9573E+02	1.5463E+00	1.721E+02	1.201E-01
1.103212E+01	2.85046E+01	2.7462E+00	1.6484E+02	1.4410E+00	1.454E+02	1.124E-01
1.179334E+01	2.87985E+01	2.4736E+00	1.3889E+02	1.3412E+00	1.229E+02	1.051E-01
1.260708E+01	2.90017E+01	2.2129E+00	1.1623E+02	1.2468E+00	1.030E+02	9.834E-02
1.347697E+01	2.91413E+01	1.9766E+00	9.7122E+01	1.1579E+00	8.623E+01	9.200E-02
1.440688E+01	2.92373E+01	1.7631E+00	8.1041E+01	1.0743E+00	7.205E+01	8.606E-02
1.540095E+01	2.93017E+01	1.5712E+00	6.7557E+01	9.9606E-01	6.012E+01	8.050E-02
1.646362E+01	2.93434E+01	1.3994E+00	5.6288E+01	9.2294E-01	5.014E+01	7.531E-02
1.759961E+01	2.93688E+01	1.2463E+00	4.6894E+01	8.5481E-01	4.181E+01	7.045E-02
1.881398E+01	2.94189E+01	1.1059E+00	3.8925E+01	7.9150E-01	3.472E+01	6.590E-02
2.011215E+01	2.94195E+01	9.7986E-01	3.2262E+01	7.3280E-01	2.878E+01	6.165E-02
2.149988E+01	2.94125E+01	8.6826E-01	2.6743E+01	6.7851E-01	2.386E+01	5.767E-02
2.298338E+01	2.94006E+01	7.6945E-01	2.2169E+01	6.2842E-01	1.978E+01	5.395E-02
2.456923E+01	2.93855E+01	6.8155E-01	1.8370E+01	5.8229E-01	1.640E+01	5.046E-02
2.626450E+01	2.93684E+01	6.0363E-01	1.5219E+01	5.3991E-01	1.360E+01	4.721E-02
2.807676E+01	2.93516E+01	5.3216E-01	1.2551E+01	5.0104E-01	1.122E+01	4.416E-02
3.001405E+01	2.93316E+01	4.6847E-01	1.0336E+01	4.6546E-01	9.252E+00	4.131E-02
3.208502E+01	2.93106E+01	4.1242E-01	8.5120E+00	4.3295E-01	7.626E+00	3.864E-02
3.429889E+01	2.92896E+01	3.6310E-01	7.0103E+00	4.0328E-01	6.286E+00	3.615E-02
3.666551E+01	2.92692E+01	3.1969E-01	5.7738E+00	3.7624E-01	5.182E+00	3.381E-02
3.919543E+01	2.92497E+01	2.8131E-01	4.7527E+00	3.5164E-01	4.268E+00	3.163E-02
4.189992E+01	2.92308E+01	2.4628E-01	3.8924E+00	3.2926E-01	3.496E+00	2.959E-02
4.479101E+01	2.92123E+01	2.1563E-01	3.1879E+00	3.0894E-01	2.863E+00	2.768E-02
4.788159E+01	2.91946E+01	1.8880E-01	2.6111E+00	2.9049E-01	2.345E+00	2.589E-02
5.118542E+01	2.91779E+01	1.6531E-01	2.1387E+00	2.7374E-01	1.921E+00	2.422E-02
5.471721E+01	2.91623E+01	1.4475E-01	1.7519E+00	2.5853E-01	1.573E+00	2.266E-02
5.849270E+01	2.91478E+01	1.2675E-01	1.4349E+00	2.4473E-01	1.288E+00	2.120E-02
6.252870E+01	2.91344E+01	1.1098E-01	1.1754E+00	2.3219E-01	1.055E+00	1.983E-02
6.684318E+01	2.91220E+01	9.7185E-02	9.6279E-01	2.2079E-01	8.643E-01	1.855E-02
7.145536E+01	2.91106E+01	8.5104E-02	7.8869E-01	2.1041E-01	7.079E-01	1.735E-02
7.638578E+01	2.91001E+01	7.4527E-02	6.4609E-01	2.0094E-01	5.798E-01	1.623E-02
8.165640E+01	2.90907E+01	6.5180E-02	5.2858E-01	1.9229E-01	4.741E-01	1.518E-02
8.729069E+01	2.90821E+01	5.6834E-02	4.3116E-01	1.8437E-01	3.865E-01	1.420E-02
9.331374E+01	2.90741E+01	4.9559E-02	3.5170E-01	1.7709E-01	3.150E-01	1.329E-02
9.975239E+01	2.90668E+01	4.3217E-02	2.8689E-01	1.7038E-01	2.567E-01	1.243E-02
1.066353E+02	2.90601E+01	3.7687E-02	2.3403E-01	1.6418E-01	2.092E-01	1.163E-02
1.139931E+02	2.90541E+01	3.2866E-02	1.9097E-01	1.5842E-01	1.705E-01	1.088E-02
1.218587E+02	2.90486E+01	2.8662E-02	1.5576E-01	1.5306E-01	1.390E-01	1.017E-02
1.302669E+02	2.90436E+01	2.4997E-02	1.2707E-01	1.4805E-01	1.133E-01	9.518E-03
1.392553E+02	2.90391E+01	2.1801E-02	1.0367E-01	1.4333E-01	9.234E-02	8.903E-03
1.488640E+02	2.90350E+01	1.9015E-02	8.4585E-02	1.3888E-01	7.526E-02	8.329E-03
1.591356E+02	2.90313E+01	1.6585E-02	6.9013E-02	1.3467E-01	6.134E-02	7.791E-03
1.701159E+02	2.90280E+01	1.4466E-02	5.6310E-02	1.3066E-01	5.000E-02	7.288E-03
1.818539E+02	2.90251E+01	1.2618E-02	4.5946E-02	1.2683E-01	4.075E-02	6.818E-03
1.944018E+02	2.90224E+01	1.1006E-02	3.7491E-02	1.2315E-01	3.321E-02	6.378E-03
2.078156E+02	2.90200E+01	9.6007E-03	3.0592E-02	1.1962E-01	2.707E-02	5.966E-03
2.221548E+02	2.90179E+01	8.3749E-03	2.4964E-02	1.1620E-01	2.206E-02	5.581E-03
2.374835E+02	2.90159E+01	7.3058E-03	2.0372E-02	1.1290E-01	1.798E-02	5.221E-03
2.538699E+02	2.90142E+01	6.3734E-03	1.6625E-02	1.0970E-01	1.466E-02	4.884E-03
2.713869E+02	2.90127E+01	5.5601E-03	1.3567E-02	1.0658E-01	1.195E-02	4.569E-03
2.901126E+02	2.90113E+01	4.8507E-03	1.1072E-02	1.0354E-01	9.737E-03	4.274E-03
3.101304E+02	2.90101E+01	4.2319E-03	9.0362E-03	1.0057E-01	7.936E-03	3.998E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
3.315294E+02	2.90090E+01	3.6922E-03	7.3748E-03	9.7675E-02	6.468E-03	3.740E-03
3.544049E+02	2.90080E+01	3.2214E-03	6.0191E-03	9.4839E-02	5.272E-03	3.498E-03
3.788588E+02	2.90071E+01	2.8106E-03	4.9127E-03	9.2064E-02	4.297E-03	3.273E-03
4.050001E+02	2.90063E+01	2.4524E-03	4.0098E-03	8.9345E-02	3.502E-03	3.061E-03
4.329451E+02	2.90056E+01	2.1398E-03	3.2729E-03	8.6680E-02	2.855E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 245

Zn Z = 30

Atomic weight = 6.538000E+01 g/mol, nominal density ρ (g/cm³) = 7.1120E+00

μ_{cl} (barns/atom) = μ (cm²/g) \times 1.08566E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 6.43627E+05

γ edges. Edge energies (keV):

K	9.65860E+00	L	I	1.19360E+00	L	II	1.04280E+00	L	III	1.01970E+00	
M	I	1.35900E-00	M	II	8.66000E-02	M	III	8.66000E-02	M	IV	8.10000E-03
M	V	8.10000E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.5183E-01, -9.5400E-02 e/atom

Nuclear Thomson correction f_{NT} = -7.5516E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
7.938000E-03	1.89392E+00	0.0000E+00	0.0000E+00	2.0403E-05	0.000E+00	1.562E+02
8.059500E-03	1.58428E+00	0.0000E+00	0.0000E+00	2.2107E-05	0.000E+00	1.538E+02
8.091900E-03	1.24074E+00	0.0000E+00	0.0000E+00	2.2579E-05	0.000E+00	1.532E+02
8.140500E-03	1.56676E+00	6.6117E-01	5.2275E+04	2.3301E-05	0.000E+00	1.523E+02
8.262000E-03	1.83711E+00	6.7285E-01	5.2416E+04	2.5185E-05	0.000E+00	1.501E+02
1.069000E-02	2.18614E+00	9.1642E-01	5.5176E+04	9.2962E-05	0.000E+00	1.160E+02
1.142761E-02	2.18313E+00	9.9609E-01	5.6102E+04	1.2856E-04	0.000E+00	1.085E+02
1.221612E-02	2.17165E+00	1.0846E+00	5.7145E+04	1.7676E-04	0.000E+00	1.015E+02
1.305903E-02	2.15396E+00	1.1832E+00	5.8313E+04	2.4168E-04	0.000E+00	9.494E+01
1.396010E-02	2.13164E+00	1.2930E+00	5.9612E+04	3.2857E-04	0.000E+00	8.881E+01
1.492335E-02	2.10599E+00	1.4153E+00	6.1041E+04	4.4421E-04	0.000E+00	8.308E+01
1.595306E-02	2.07822E+00	1.5516E+00	6.2600E+04	5.9721E-04	0.000E+00	7.772E+01
1.705382E-02	2.04961E+00	1.7033E+00	6.4283E+04	7.9848E-04	0.000E+00	7.270E+01
1.823053E-02	2.02156E+00	1.8717E+00	6.6081E+04	1.0617E-03	0.000E+00	6.801E+01
1.948844E-02	1.99571E+00	2.0584E+00	6.7982E+04	1.4041E-03	0.000E+00	6.362E+01
2.083314E-02	1.97391E+00	2.2648E+00	6.9969E+04	1.8469E-03	0.000E+00	5.951E+01
2.227063E-02	1.95833E+00	2.4922E+00	7.2024E+04	2.4161E-03	0.000E+00	5.567E+01
2.380730E-02	1.95148E+00	2.7417E+00	7.4123E+04	3.1440E-03	0.000E+00	5.208E+01
2.545001E-02	1.91980E+00	3.0145E+00	7.6237E+04	4.0695E-03	0.000E+00	4.872E+01
2.720606E-02	1.93967E+00	3.3112E+00	7.8335E+04	5.2397E-03	0.000E+00	4.557E+01
2.908327E-02	1.97834E+00	3.6322E+00	8.0383E+04	6.7111E-03	0.000E+00	4.263E+01
3.109002E-02	2.04040E+00	3.9774E+00	8.2341E+04	8.5510E-03	0.000E+00	3.988E+01
3.323523E-02	2.13183E+00	4.3457E+00	8.4158E+04	1.0839E-02	0.000E+00	3.731E+01
3.552846E-02	2.25682E+00	4.7295E+00	8.5679E+04	1.3669E-02	0.000E+00	3.490E+01
3.797993E-02	2.41567E+00	5.1247E+00	8.6845E+04	1.7150E-02	0.000E+00	3.264E+01
4.060054E-02	2.60900E+00	5.5282E+00	8.7636E+04	2.1409E-02	0.000E+00	3.054E+01
4.340198E-02	2.83737E+00	5.9369E+00	8.8040E+04	2.6592E-02	0.000E+00	2.857E+01
4.639671E-02	3.10102E+00	6.3475E+00	8.8054E+04	3.2865E-02	0.000E+00	2.672E+01
4.959809E-02	3.39971E+00	6.7568E+00	8.7682E+04	4.0416E-02	0.000E+00	2.500E+01
5.302035E-02	3.73279E+00	7.1617E+00	8.6937E+04	4.9458E-02	0.000E+00	2.338E+01
5.667876E-02	4.09943E+00	7.5593E+00	8.5841E+04	6.0229E-02	0.000E+00	2.187E+01
6.058959E-02	4.50246E+00	7.9471E+00	8.4420E+04	7.2990E-02	0.000E+00	2.046E+01
6.477028E-02	4.96402E+00	8.3109E+00	8.2586E+04	8.8030E-02	0.000E+00	1.914E+01
6.923942E-02	5.42968E+00	8.6535E+00	8.0271E+04	1.0566E-01	0.000E+00	1.791E+01
7.401695E-02	5.88267E+00	8.9287E+00	7.7641E+04	1.2623E-01	0.000E+00	1.675E+01
7.912411E-02	6.28468E+00	9.1879E+00	7.4738E+04	1.5009E-01	0.000E+00	1.567E+01
8.458368E-02	6.38470E+00	9.4104E+00	7.1607E+04	1.7762E-01	0.000E+00	1.466E+01
8.486800E-02	6.35349E+00	9.4205E+00	7.1444E+04	1.7911E-01	0.000E+00	1.461E+01
8.616700E-02	5.90480E+00	9.4654E+00	7.0702E+04	1.8598E-01	0.000E+00	1.439E+01
8.651340E-02	5.22864E+00	9.4769E+00	7.0505E+04	1.8783E-01	0.000E+00	1.433E+01
8.703300E-02	6.04111E+00	1.0902E+01	8.0620E+04	1.9062E-01	0.000E+00	1.425E+01
8.833200E-02	6.84154E+00	1.0895E+01	7.9386E+04	1.9768E-01	0.000E+00	1.404E+01
9.041995E-02	7.44473E+00	1.0884E+01	7.7473E+04	2.0924E-01	0.000E+00	1.371E+01
9.665893E-02	8.49813E+00	1.0847E+01	7.2228E+04	2.4535E-01	0.000E+00	1.283E+01
1.033284E-01	9.27197E+00	1.0845E+01	6.7553E+04	2.8638E-01	0.000E+00	1.200E+01
1.104581E-01	9.96770E+00	1.0871E+01	6.3343E+04	3.3277E-01	0.000E+00	1.122E+01
1.180797E-01	1.06284E+01	1.0904E+01	5.9437E+04	3.8494E-01	0.000E+00	1.050E+01
1.262272E-01	1.12517E+01	1.0936E+01	5.5764E+04	4.4330E-01	0.000E+00	9.822E+00
1.331820E-01	1.16453E+01	1.0958E+01	5.2958E+04	4.9498E-01	0.000E+00	9.309E+00
1.349368E-01	1.16353E+01	1.0963E+01	5.2292E+04	5.0826E-01	0.000E+00	9.188E+00
1.352205E-01	1.16068E+01	1.0964E+01	5.2186E+04	5.1042E-01	0.000E+00	9.169E+00
1.357641E-01	1.14140E+01	1.0965E+01	5.1984E+04	5.1456E-01	0.000E+00	9.132E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.365795E-01	1.17133E+01	1.1429E+01	5.3860E+04	5.2078E-01	0.000E+00	9.078E+00
1.386180E-01	1.20794E+01	1.1441E+01	5.3124E+04	5.3642E-01	0.000E+00	8.944E+00
1.442475E-01	1.27012E+01	1.1472E+01	5.1189E+04	5.8020E-01	0.000E+00	8.595E+00
1.542005E-01	1.36448E+01	1.1437E+01	4.7737E+04	6.5943E-01	0.000E+00	8.040E+00
1.648404E-01	1.44977E+01	1.1070E+01	4.3222E+04	7.4626E-01	0.000E+00	7.521E+00
1.762144E-01	1.52357E+01	1.0696E+01	3.9068E+04	8.4092E-01	0.000E+00	7.036E+00
1.883732E-01	1.58898E+01	1.0320E+01	3.5262E+04	9.4357E-01	0.000E+00	6.582E+00
2.013709E-01	1.64779E+01	9.9442E+00	3.1784E+04	1.0543E+00	0.000E+00	6.157E+00
2.152655E-01	1.70117E+01	9.5693E+00	2.8611E+04	1.1731E+00	0.000E+00	5.760E+00
2.301188E-01	1.74994E+01	9.1959E+00	2.5720E+04	1.3000E+00	0.000E+00	5.388E+00
2.459970E-01	1.79464E+01	8.8239E+00	2.3087E+04	1.4346E+00	0.000E+00	5.040E+00
2.629708E-01	1.83590E+01	8.4529E+00	2.0689E+04	1.5768E+00	0.000E+00	4.715E+00
2.811158E-01	1.87336E+01	8.0824E+00	1.8505E+04	1.7262E+00	0.000E+00	4.410E+00
3.005128E-01	1.90739E+01	7.7122E+00	1.6518E+04	1.8821E+00	0.000E+00	4.126E+00
3.212482E-01	1.93800E+01	7.3424E+00	1.4711E+04	2.0440E+00	0.000E+00	3.859E+00
3.434143E-01	1.96517E+01	6.9736E+00	1.3070E+04	2.2111E+00	0.000E+00	3.610E+00
3.671099E-01	1.98882E+01	6.6052E+00	1.1580E+04	2.3827E+00	0.000E+00	3.377E+00
3.924405E-01	2.00860E+01	6.2364E+00	1.0228E+04	2.5577E+00	0.000E+00	3.159E+00
4.195189E-01	2.02402E+01	5.8703E+00	9.0062E+03	2.7351E+00	0.000E+00	2.955E+00
4.484657E-01	2.03509E+01	5.5099E+00	7.9077E+03	2.9138E+00	0.000E+00	2.765E+00
4.794098E-01	2.04139E+01	5.1581E+00	6.9250E+03	3.0926E+00	0.000E+00	2.586E+00
5.124891E-01	2.04261E+01	4.8174E+00	6.0501E+03	3.2702E+00	0.000E+00	2.419E+00
5.478508E-01	2.03829E+01	4.4899E+00	5.2749E+03	3.4454E+00	0.000E+00	2.263E+00
5.856525E-01	2.02777E+01	4.1770E+00	4.5905E+03	3.6168E+00	0.000E+00	2.117E+00
6.260625E-01	2.00994E+01	3.8799E+00	3.9888E+03	3.7830E+00	0.000E+00	1.980E+00
6.692609E-01	1.98305E+01	3.5993E+00	3.4614E+03	3.9429E+00	0.000E+00	1.853E+00
7.154399E-01	1.94417E+01	3.3356E+00	3.0008E+03	4.0951E+00	0.000E+00	1.733E+00
7.648052E-01	1.88803E+01	3.0889E+00	2.5995E+03	4.2383E+00	0.000E+00	1.621E+00
8.175768E-01	1.80422E+01	2.8590E+00	2.2507E+03	4.3715E+00	0.000E+00	1.516E+00
8.739896E-01	1.66852E+01	2.6453E+00	1.9480E+03	4.4935E+00	0.000E+00	1.419E+00
9.342948E-01	1.40447E+01	2.4473E+00	1.6859E+03	4.6033E+00	0.000E+00	1.327E+00
9.987612E-01	4.43915E+00	2.2642E+00	1.4591E+03	4.7000E+00	0.000E+00	1.241E+00
9.993060E-01	4.22232E+00	2.2627E+00	1.4574E+03	4.7008E+00	0.000E+00	1.241E+00
1.014602E+00	-8.80642E+00	2.2113E+00	1.4028E+03	4.7209E+00	0.000E+00	1.222E+00
1.018680E+00	-2.71644E+01	2.1978E+00	1.3886E+03	4.7261E+00	0.000E+00	1.217E+00
1.021944E+00	-1.37812E+01	4.1265E+01	2.5989E+04	4.7302E+00	0.000E+00	1.213E+00
1.024799E+00	-1.83273E+00	3.8041E+01	2.3892E+04	4.7337E+00	0.000E+00	1.210E+00
1.037586E+00	1.01428E+01	2.6623E+01	1.6515E+04	4.7492E+00	0.000E+00	1.195E+00
1.040094E+00	8.08492E+00	2.4862E+01	1.5385E+04	4.7522E+00	0.000E+00	1.192E+00
1.041757E+00	3.36022E+00	2.3766E+01	1.4684E+04	4.7541E+00	0.000E+00	1.190E+00
1.048014E+00	1.80178E+01	3.7728E+01	2.3170E+04	4.7613E+00	0.000E+00	1.183E+00
1.063656E+00	2.78989E+01	2.4653E+01	1.4918E+04	4.7787E+00	0.000E+00	1.166E+00
1.067676E+00	2.83111E+01	2.2168E+01	1.3364E+04	4.7830E+00	0.000E+00	1.161E+00
1.141345E+00	2.34120E+01	1.0256E+01	5.7838E+03	4.8516E+00	0.000E+00	1.086E+00
1.169728E+00	2.19594E+01	9.8133E+00	5.3996E+03	4.8731E+00	0.000E+00	1.060E+00
1.187632E+00	2.07902E+01	9.7671E+00	5.2932E+03	4.8854E+00	0.000E+00	1.044E+00
1.192406E+00	1.97779E+01	9.7711E+00	5.2741E+03	4.8885E+00	0.000E+00	1.040E+00
1.199568E+00	2.05918E+01	1.1614E+01	6.2314E+03	4.8931E+00	0.000E+00	1.034E+00
1.217472E+00	2.12164E+01	1.1689E+01	6.1794E+03	4.9038E+00	0.000E+00	1.018E+00
1.220098E+00	2.12573E+01	1.1705E+01	6.1746E+03	4.9053E+00	0.000E+00	1.016E+00
1.304285E+00	2.23013E+01	1.2588E+01	6.2118E+03	4.9438E+00	0.000E+00	9.506E-01
1.394281E+00	2.42698E+01	1.3003E+01	6.0026E+03	4.9669E+00	0.000E+00	8.892E-01
1.490486E+00	2.62399E+01	1.2553E+01	5.4207E+03	4.9746E+00	0.000E+00	8.318E-01
1.593329E+00	2.79067E+01	1.1522E+01	4.6543E+03	4.9671E+00	0.000E+00	7.781E-01
1.703269E+00	2.90490E+01	1.0179E+01	3.8464E+03	4.9444E+00	0.000E+00	7.279E-01
1.820795E+00	2.96864E+01	8.8372E+00	3.1238E+03	4.9072E+00	0.000E+00	6.809E-01
1.946430E+00	2.99637E+01	7.6685E+00	2.5357E+03	4.8558E+00	0.000E+00	6.370E-01
2.080733E+00	3.01242E+01	6.7459E+00	2.0867E+03	4.7909E+00	0.000E+00	5.959E-01
2.224304E+00	3.02004E+01	6.0607E+00	1.7537E+03	4.7133E+00	0.000E+00	5.574E-01
2.377781E+00	3.02295E+01	5.4518E+00	1.4757E+03	4.6238E+00	0.000E+00	5.214E-01
2.541848E+00	3.02822E+01	4.8987E+00	1.2404E+03	4.5234E+00	0.000E+00	4.878E-01
2.717235E+00	3.02732E+01	4.4032E+00	1.0430E+03	4.4129E+00	0.000E+00	4.563E-01
2.904724E+00	3.02503E+01	3.9609E+00	8.7765E+02	4.2935E+00	0.000E+00	4.268E-01
3.105150E+00	3.02295E+01	3.5439E+00	7.3456E+02	4.1661E+00	0.000E+00	3.993E-01
3.319406E+00	3.01774E+01	3.1549E+00	6.1174E+02	4.0319E+00	0.000E+00	3.735E-01

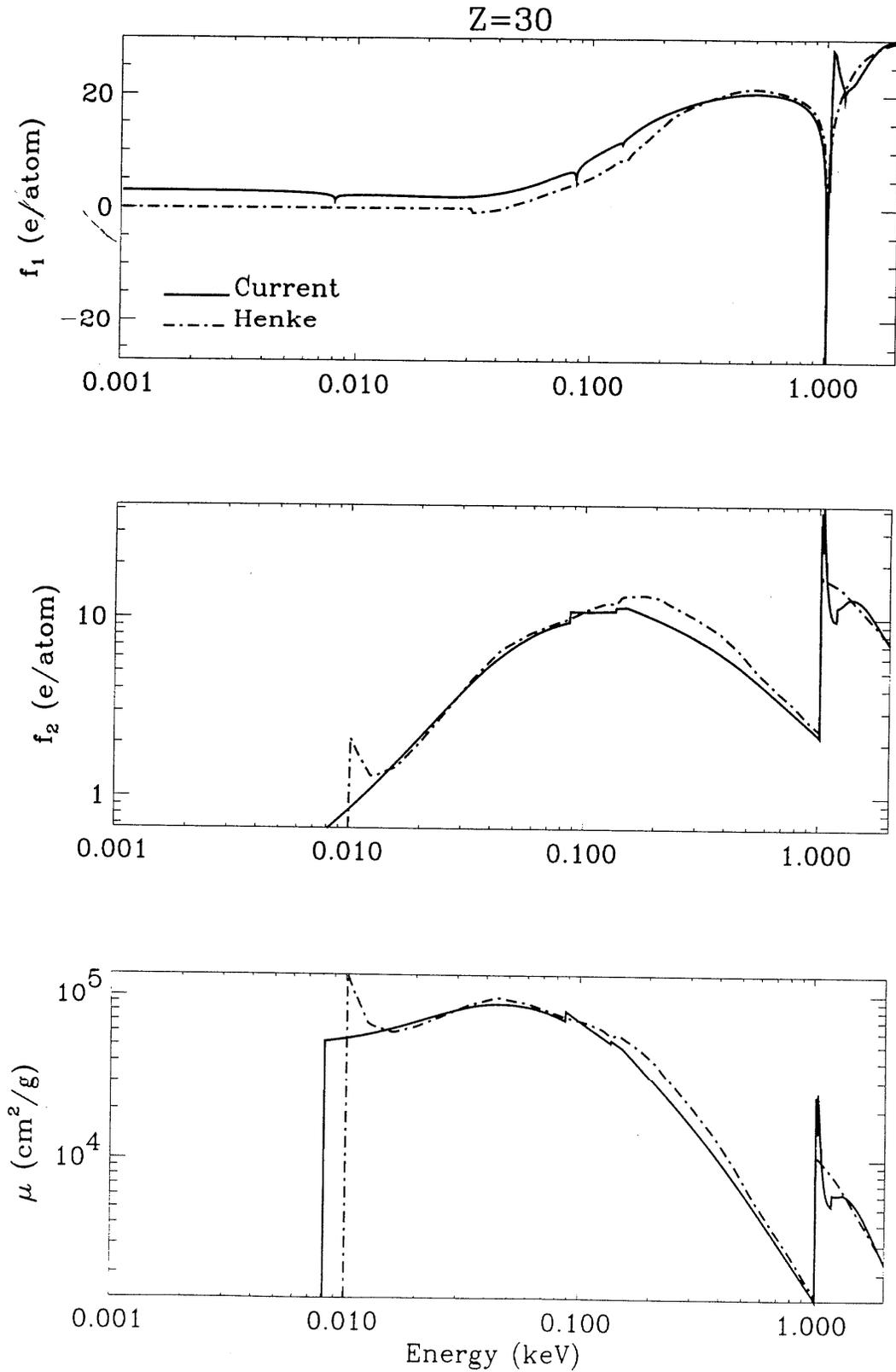
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 247

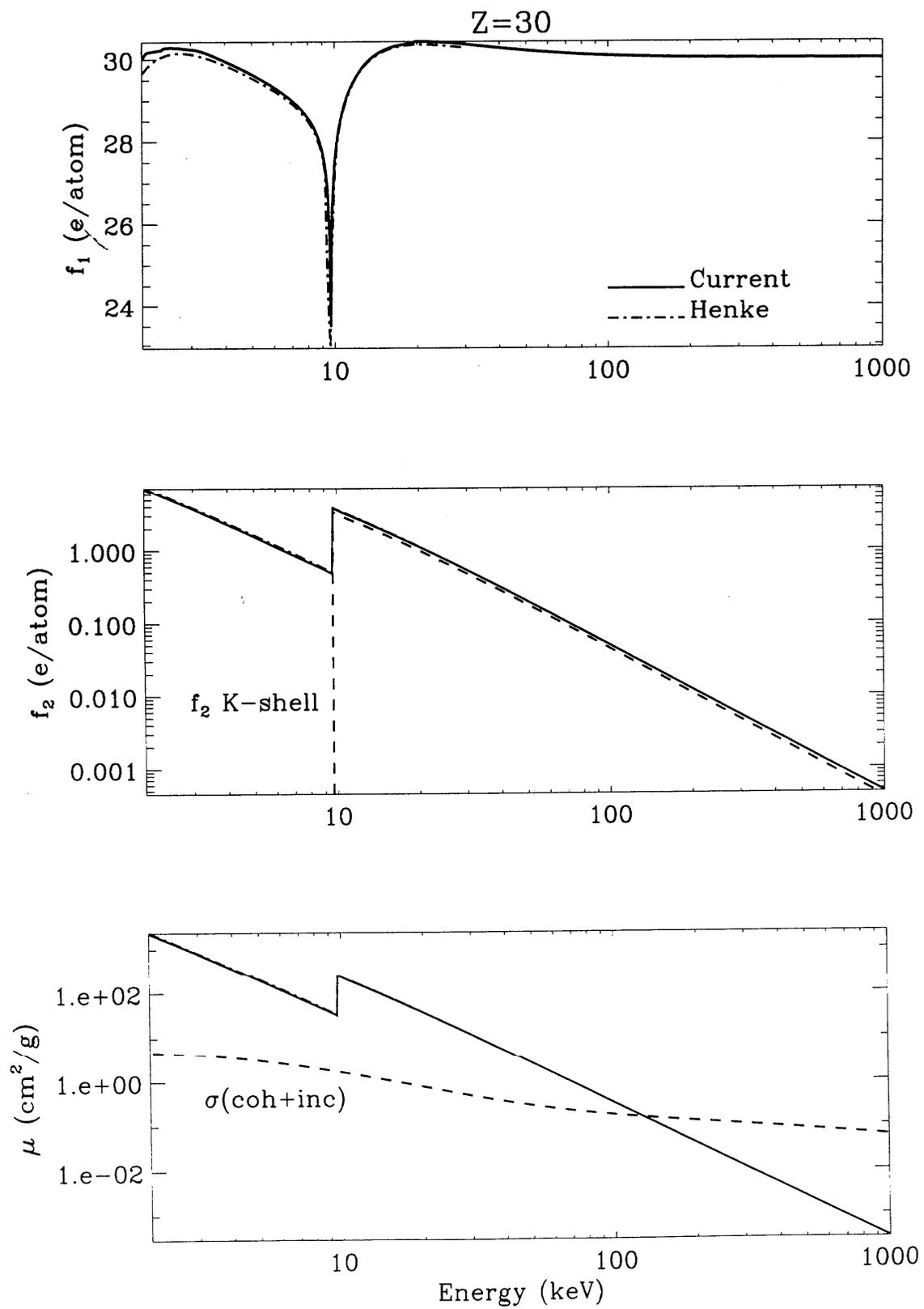
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
3.548445E+00	3.01047E+01	2.8112E+00	5.0990E+02	3.8920E+00	0.000E+00	3.494E-01
3.793288E+00	3.00214E+01	2.5071E+00	4.2539E+02	3.7474E+00	0.000E+00	3.269E-01
4.055024E+00	2.99323E+01	2.2378E+00	3.5519E+02	3.5992E+00	0.000E+00	3.058E-01
4.334821E+00	2.98409E+01	1.9993E+00	2.9686E+02	3.4485E+00	0.000E+00	2.860E-01
4.633924E+00	2.97477E+01	1.7805E+00	2.4730E+02	3.2962E+00	0.000E+00	2.676E-01
4.953664E+00	2.96474E+01	1.5830E+00	2.0568E+02	3.1433E+00	0.000E+00	2.503E-01
5.295467E+00	2.95425E+01	1.4068E+00	1.7098E+02	2.9906E+00	0.000E+00	2.341E-01
5.660855E+00	2.94298E+01	1.2471E+00	1.4180E+02	2.8391E+00	0.000E+00	2.190E-01
6.051453E+00	2.93081E+01	1.1067E+00	1.1770E+02	2.6894E+00	0.000E+00	2.049E-01
6.469004E+00	2.91752E+01	9.8299E-01	9.7801E+01	2.5423E+00	0.000E+00	1.917E-01
6.915365E+00	2.90257E+01	8.7397E-01	8.1343E+01	2.3983E+00	0.000E+00	1.793E-01
7.392525E+00	2.88496E+01	7.7780E-01	6.7719E+01	2.2581E+00	0.000E+00	1.677E-01
7.902609E+00	2.86263E+01	6.9289E-01	5.6432E+01	2.1221E+00	0.000E+00	1.569E-01
8.447890E+00	2.83080E+01	6.1784E-01	4.7072E+01	1.9906E+00	0.000E+00	1.468E-01
9.030794E+00	2.77367E+01	5.4929E-01	3.9148E+01	1.8641E+00	0.000E+00	1.373E-01
9.65428E+00	2.66177E+01	5.0093E-01	3.4062E+01	1.7781E+00	0.000E+00	1.310E-01
9.610307E+00	2.52001E+01	4.8628E-01	3.2568E+01	1.7508E+00	0.000E+00	1.290E-01
9.653919E+00	2.27080E+01	4.8201E-01	3.2135E+01	1.7428E+00	0.000E+00	1.284E-01
9.706893E+00	2.52381E+01	3.8531E+00	2.5548E+02	1.7330E+00	2.239E+02	1.277E-01
9.851772E+00	2.68206E+01	3.7401E+00	2.4434E+02	1.7069E+00	2.141E+02	1.258E-01
1.032004E+01	2.82422E+01	3.4219E+00	2.1341E+02	1.6268E+00	1.870E+02	1.201E-01
1.103212E+01	2.90456E+01	3.0610E+00	1.7858E+02	1.5164E+00	1.569E+02	1.124E-01
1.179334E+01	2.94892E+01	2.7556E+00	1.5039E+02	1.4116E+00	1.325E+02	1.051E-01
1.260708E+01	2.97882E+01	2.4851E+00	1.2687E+02	1.3124E+00	1.122E+02	9.834E-02
1.347697E+01	2.99968E+01	2.2238E+00	1.0620E+02	1.2188E+00	9.406E+01	9.200E-02
1.440688E+01	3.01393E+01	1.9866E+00	8.8753E+01	1.1309E+00	7.873E+01	8.606E-02
1.540095E+01	3.02370E+01	1.7721E+00	7.4058E+01	1.0484E+00	6.578E+01	8.050E-02
1.646362E+01	3.03025E+01	1.5790E+00	6.1730E+01	9.7121E-01	5.489E+01	7.531E-02
1.759961E+01	3.03446E+01	1.4062E+00	5.1427E+01	8.9927E-01	4.577E+01	7.045E-02
1.881398E+01	3.03700E+01	1.2523E+00	4.2840E+01	8.3234E-01	3.816E+01	6.590E-02
2.011215E+01	3.04195E+01	1.1123E+00	3.5595E+01	7.7025E-01	3.171E+01	6.165E-02
2.149988E+01	3.04206E+01	9.8624E-01	2.9524E+01	7.1278E-01	2.631E+01	5.767E-02
2.298338E+01	3.04141E+01	8.7440E-01	2.4487E+01	6.5971E-01	2.182E+01	5.395E-02
2.456923E+01	3.04028E+01	7.7527E-01	2.0309E+01	6.1081E-01	1.810E+01	5.046E-02
2.626450E+01	3.03892E+01	6.8720E-01	1.6840E+01	5.6586E-01	1.501E+01	4.721E-02
2.807676E+01	3.03746E+01	6.0610E-01	1.3894E+01	5.2460E-01	1.240E+01	4.416E-02
3.001405E+01	3.03546E+01	5.3381E-01	1.1447E+01	4.8683E-01	1.023E+01	4.131E-02
3.208502E+01	3.03335E+01	4.7016E-01	9.4315E+00	4.5229E-01	8.433E+00	3.864E-02
3.429889E+01	3.03120E+01	4.1413E-01	7.7713E+00	4.2077E-01	6.955E+00	3.615E-02
3.666551E+01	3.02907E+01	3.6481E-01	6.4038E+00	3.9204E-01	5.736E+00	3.381E-02
3.919543E+01	3.02701E+01	3.2137E-01	5.2772E+00	3.6589E-01	4.730E+00	3.163E-02
4.189992E+01	3.02505E+01	2.8309E-01	4.3486E+00	3.4212E-01	3.901E+00	2.959E-02
4.479101E+01	3.02315E+01	2.4795E-01	3.5629E+00	3.2054E-01	3.196E+00	2.768E-02
4.788159E+01	3.02130E+01	2.1718E-01	2.9194E+00	3.0094E-01	2.619E+00	2.589E-02
5.118542E+01	3.01953E+01	1.9024E-01	2.3922E+00	2.8317E-01	2.146E+00	2.422E-02
5.471721E+01	3.01786E+01	1.6665E-01	1.9603E+00	2.6705E-01	1.758E+00	2.266E-02
5.849270E+01	3.01630E+01	1.4599E-01	1.6064E+00	2.5242E-01	1.440E+00	2.120E-02
6.252870E+01	3.01484E+01	1.2789E-01	1.3164E+00	2.3916E-01	1.180E+00	1.983E-02
6.684318E+01	3.01350E+01	1.1203E-01	1.0787E+00	2.2711E-01	9.669E-01	1.855E-02
7.145536E+01	3.01225E+01	9.8139E-02	8.8398E-01	2.1616E-01	7.923E-01	1.735E-02
7.638578E+01	3.01111E+01	8.5974E-02	7.2441E-01	2.0619E-01	6.491E-01	1.623E-02
8.165640E+01	3.01011E+01	7.5223E-02	5.9292E-01	1.9710E-01	5.311E-01	1.518E-02
8.729069E+01	3.00916E+01	6.5631E-02	4.8392E-01	1.8879E-01	4.332E-01	1.420E-02
9.331374E+01	3.00827E+01	5.7264E-02	3.9498E-01	1.8118E-01	3.533E-01	1.329E-02
9.975239E+01	3.00746E+01	4.9966E-02	3.2239E-01	1.7418E-01	2.881E-01	1.243E-02
1.066353E+02	3.00672E+01	4.3599E-02	2.6315E-01	1.6772E-01	2.350E-01	1.163E-02
1.139931E+02	3.00605E+01	3.8045E-02	2.1481E-01	1.6174E-01	1.916E-01	1.088E-02
1.218587E+02	3.00544E+01	3.3199E-02	1.7535E-01	1.5619E-01	1.563E-01	1.017E-02
1.302669E+02	3.00488E+01	2.8972E-02	1.4314E-01	1.5100E-01	1.275E-01	9.518E-03
1.392553E+02	3.00438E+01	2.5283E-02	1.1686E-01	1.4614E-01	1.040E-01	8.903E-03
1.488640E+02	3.00393E+01	2.2065E-02	9.5400E-02	1.4155E-01	8.479E-02	8.329E-03
1.591356E+02	3.00352E+01	1.9257E-02	7.7886E-02	1.3722E-01	6.916E-02	7.791E-03
1.701159E+02	3.00315E+01	1.6807E-02	6.3588E-02	1.3310E-01	5.640E-02	7.288E-03
1.818539E+02	3.00282E+01	1.4669E-02	5.1917E-02	1.2918E-01	4.600E-02	6.818E-03
1.944018E+02	3.00252E+01	1.2803E-02	4.2389E-02	1.2541E-01	3.752E-02	6.378E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.078156E+02	3.00225E+01	1.1175E-02	3.4611E-02	1.2179E-01	3.060E-02	5.966E-03
2.221548E+02	3.00201E+01	9.7545E-03	2.8261E-02	1.1829E-01	2.495E-02	5.581E-03
2.374835E+02	3.00180E+01	8.5146E-03	2.3076E-02	1.1491E-01	2.035E-02	5.221E-03
2.538699E+02	3.00160E+01	7.4325E-03	1.8843E-02	1.1162E-01	1.660E-02	4.884E-03
2.713869E+02	3.00143E+01	6.4882E-03	1.5387E-02	1.0842E-01	1.354E-02	4.569E-03
2.901126E+02	3.00128E+01	5.6639E-03	1.2566E-02	1.0530E-01	1.104E-02	4.274E-03
3.101304E+02	3.00114E+01	4.9445E-03	1.0262E-02	1.0225E-01	9.005E-03	3.998E-03
3.315294E+02	3.00101E+01	4.3166E-03	8.3802E-03	9.9261E-02	7.344E-03	3.740E-03
3.544049E+02	3.00090E+01	3.7685E-03	6.8439E-03	9.6334E-02	5.990E-03	3.498E-03
3.788588E+02	3.00080E+01	3.2901E-03	5.5894E-03	9.3463E-02	4.885E-03	3.273E-03
4.050001E+02	3.00071E+01	2.8725E-03	4.5650E-03	9.0645E-02	3.984E-03	3.061E-03
4.329451E+02	3.00064E+01	2.5080E-03	3.7285E-03	8.7878E-02	3.249E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 251

Ga Z = 31

Atomic weight = 6.972000E+01 g/mol, nominal density ρ (g/cm³) = 5.8770E+00

μ₀(barns/atom) = μ(cm²/g) × 1.15773E+02, E(eV) μ(cm²/g) = f₂(e/atom) × 6.03562E+05

ψ edges, Edge energies (keV):

K		1.03671E+00	L	I	1.29770E+00	L	II	1.14230E+00	L	III	1.11540E+00
M	I	1.58100E-00	M	II	1.06800E-00	M	III	1.02900E-00	M	IV	1.74000E-02
M	V	1.74000E-02									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.6423E-01, -1.0320E-01 e/atom

Nuclear Thomson correction f_{NT} = -7.5615E-03 e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.069000E-02	3.15198E+00	0.0000E+00	0.0000E+00	9.6976E-05	0.000E+00	1.160E+02
1.142761E-02	3.09183E+00	0.0000E+00	0.0000E+00	1.3376E-04	0.000E+00	1.085E+02
1.221612E-02	3.01884E+00	0.0000E+00	0.0000E+00	1.8345E-04	0.000E+00	1.015E+02
1.305903E-02	2.92860E+00	0.0000E+00	0.0000E+00	2.5019E-04	0.000E+00	9.494E+01
1.396010E-02	2.81368E+00	0.0000E+00	0.0000E+00	3.3933E-04	0.000E+00	8.881E+01
1.492335E-02	2.65950E+00	0.0000E+00	0.0000E+00	4.5768E-04	0.000E+00	8.308E+01
1.595306E-02	2.42810E+00	0.0000E+00	0.0000E+00	6.1392E-04	0.000E+00	7.772E+01
1.705382E-02	1.90191E+00	0.0000E+00	0.0000E+00	8.1901E-04	0.000E+00	7.270E+01
1.731300E-02	1.45080E+00	0.0000E+00	0.0000E+00	8.7349E-04	0.000E+00	7.161E+01
1.738260E 02	9.45019E 01	0.0000E+00	0.0000E+00	8.8854E 04	0.000E+00	7.133E+01
1.748700E-02	1.43339E+00	9.7516E-01	3.3658E+04	9.1146E-04	0.000E+00	7.090E+01
1.774800E-02	1.83886E+00	9.7958E-01	3.3313E+04	9.7054E-04	0.000E+00	6.986E+01
1.823053E-02	2.06446E+00	9.8763E-01	3.2698E+04	1.0867E-03	0.000E+00	6.801E+01
1.948844E-02	2.22367E+00	1.0092E+00	3.1256E+04	1.4341E-03	0.000E+00	6.362E+01
2.083314E-02	2.21897E+00	1.0578E+00	3.0645E+04	1.8825E-03	0.000E+00	5.951E+01
2.227063E-02	2.15214E+00	1.1418E+00	3.0944E+04	2.4579E-03	0.000E+00	5.567E+01
2.380730E-02	2.05080E+00	1.2615E+00	3.1981E+04	3.1922E-03	0.000E+00	5.208E+01
2.545001E-02	1.92725E+00	1.4188E+00	3.3647E+04	4.1242E-03	0.000E+00	4.872E+01
2.720060E-02	1.78929E+00	1.6168E+00	3.5869E+04	5.3006E-03	0.000E+00	4.557E+01
2.908327E-02	1.64356E+00	1.8592E+00	3.8585E+04	6.7773E-03	0.000E+00	4.263E+01
3.109002E-02	1.49683E+00	2.1500E+00	4.1738E+04	8.6209E-03	0.000E+00	3.988E+01
3.323523E-02	1.35666E+00	2.4925E+00	4.5264E+04	1.0910E-02	0.000E+00	3.731E+01
3.552846E-02	1.23162E+00	2.8896E+00	4.9089E+04	1.3737E-02	0.000E+00	3.490E+01
3.797993E-02	1.13137E+00	3.3429E+00	5.3124E+04	1.7210E-02	0.000E+00	3.264E+01
4.060054E-02	1.06643E+00	3.8522E+00	5.7267E+04	2.1452E-02	0.000E+00	3.054E+01
4.340198E-02	1.04790E+00	4.4153E+00	6.1401E+04	2.6608E-02	0.000E+00	2.857E+01
4.639671E-02	1.08696E+00	5.0277E+00	6.5403E+04	3.2840E-02	0.000E+00	2.672E+01
4.959809E-02	1.19432E+00	5.6822E+00	6.9146E+04	4.0333E-02	0.000E+00	2.500E+01
5.302035E-02	1.38877E+00	6.3693E+00	7.2505E+04	4.9296E-02	0.000E+00	2.338E+01
5.667876E-02	1.66014E+00	7.0772E+00	7.5364E+04	5.9960E-02	0.000E+00	2.187E+01
6.058959E-02	2.02335E+00	7.7923E+00	7.7623E+04	7.2582E-02	0.000E+00	2.046E+01
6.477028E-02	2.48203E+00	8.4996E+00	7.9203E+04	8.7443E-02	0.000E+00	1.914E+01
6.923942E-02	3.03821E+00	9.1832E+00	8.0050E+04	1.0485E-01	0.000E+00	1.791E+01
7.401695E-02	3.69108E+00	9.8181E+00	8.0061E+04	1.2513E-01	0.000E+00	1.675E+01
7.912411E-02	4.42213E+00	1.0377E+01	7.9152E+04	1.4864E-01	0.000E+00	1.567E+01
8.458368E-02	5.20610E+00	1.0846E+01	7.7393E+04	1.7576E-01	0.000E+00	1.466E+01
9.041995E-02	6.01082E+00	1.1218E+01	7.4879E+04	2.0687E-01	0.000E+00	1.371E+01
9.665893E-02	6.77799E+00	1.1487E+01	7.1726E+04	2.4238E-01	0.000E+00	1.283E+01
1.008420E-01	7.14467E+00	1.1604E+01	6.9450E+04	2.6740E-01	0.000E+00	1.229E+01
1.023855E-01	7.11392E+00	1.1635E+01	6.8590E+04	2.7687E-01	0.000E+00	1.211E+01
1.027971E 01	6.91461E+00	1.1643E+01	6.8359E+04	2.7941E 01	0.000E+00	1.206E+01
1.033284E-01	7.18608E+00	1.2131E+01	7.0857E+04	2.8271E-01	0.000E+00	1.200E+01
1.034145E-01	7.22281E+00	1.2133E+01	7.0810E+04	2.8324E-01	0.000E+00	1.199E+01
1.046640E-01	7.53327E+00	1.2159E+01	7.0117E+04	2.9106E-01	0.000E+00	1.185E+01
1.049580E-01	7.58273E+00	1.2165E+01	6.9953E+04	2.9291E-01	0.000E+00	1.181E+01
1.062660E-01	7.72946E+00	1.2188E+01	6.9224E+04	3.0119E-01	0.000E+00	1.167E+01
1.066932E-01	7.68165E+00	1.2195E+01	6.8985E+04	3.0391E-01	0.000E+00	1.162E+01
1.073340E-01	7.90187E+00	1.2437E+01	6.9934E+04	3.0801E-01	0.000E+00	1.155E+01
1.089360E-01	8.24646E+00	1.2461E+01	6.9041E+04	3.1834E-01	0.000E+00	1.138E+01
1.104581E-01	8.50418E+00	1.2480E+01	6.8192E+04	3.2827E-01	0.000E+00	1.122E+01
1.180797E-01	9.56869E+00	1.2517E+01	6.3982E+04	3.7948E-01	0.000E+00	1.050E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.262272E-01	1.05176E+01	1.2480E+01	5.9676E+04	4.3675E-01	0.000E+00	9.822E+00
1.349368E-01	1.13901E+01	1.2380E+01	5.5375E+04	5.0046E-01	0.000E+00	9.188E+00
1.442475E-01	1.21765E+01	1.2225E+01	5.1152E+04	5.7099E-01	0.000E+00	8.595E+00
1.542005E-01	1.27848E+01	1.2025E+01	4.7066E+04	6.4865E-01	0.000E+00	8.040E+00
1.549380E-01	1.28065E+01	1.2009E+01	4.6780E+04	6.5449E-01	0.000E+00	8.002E+00
1.573095E-01	1.27561E+01	1.1957E+01	4.5876E+04	6.7332E-01	0.000E+00	7.882E+00
1.579419E-01	1.25398E+01	1.1943E+01	4.5639E+04	6.7836E-01	0.000E+00	7.850E+00
1.588905E-01	1.28669E+01	1.2434E+01	4.7231E+04	6.8593E-01	0.000E+00	7.803E+00
1.612620E-01	1.32580E+01	1.2388E+01	4.6364E+04	7.0492E-01	0.000E+00	7.688E+00
1.648404E-01	1.36262E+01	1.2317E+01	4.5098E+04	7.3374E-01	0.000E+00	7.521E+00
1.762144E-01	1.45147E+01	1.2084E+01	4.1391E+04	8.2648E-01	0.000E+00	7.036E+00
1.883732E-01	1.52959E+01	1.1827E+01	3.7895E+04	9.2704E-01	0.000E+00	6.582E+00
2.013709E-01	1.60188E+01	1.1548E+01	3.4612E+04	1.0355E+00	0.000E+00	6.157E+00
2.152655E-01	1.66967E+01	1.1251E+01	3.1545E+04	1.1519E+00	0.000E+00	5.760E+00
2.301188E-01	1.73360E+01	1.0939E+01	2.8690E+04	1.2761E+00	0.000E+00	5.388E+00
2.459970E-01	1.79414E+01	1.0614E+01	2.6043E+04	1.4080E+00	0.000E+00	5.040E+00
2.629708E-01	1.85163E+01	1.0279E+01	2.3593E+04	1.5473E+00	0.000E+00	4.715E+00
2.811158E-01	1.90643E+01	9.9349E+00	2.1331E+04	1.6936E+00	0.000E+00	4.410E+00
3.005128E-01	1.95895E+01	9.5828E+00	1.9246E+04	1.8465E+00	0.000E+00	4.126E+00
3.212482E-01	2.00952E+01	9.2241E+00	1.7330E+04	2.0052E+00	0.000E+00	3.859E+00
3.434143E-01	2.05727E+01	8.7314E+00	1.5346E+04	2.1691E+00	0.000E+00	3.610E+00
3.671099E-01	2.09634E+01	8.2053E+00	1.3490E+04	2.3375E+00	0.000E+00	3.377E+00
3.924405E-01	2.12796E+01	7.6944E+00	1.1834E+04	2.5093E+00	0.000E+00	3.159E+00
4.195189E-01	2.15316E+01	7.2003E+00	1.0359E+04	2.6835E+00	0.000E+00	2.955E+00
4.484657E-01	2.17256E+01	6.7227E+00	9.0477E+03	2.8592E+00	0.000E+00	2.765E+00
4.794098E-01	2.18639E+01	6.2622E+00	7.8839E+03	3.0350E+00	0.000E+00	2.586E+00
5.124891E-01	2.19465E+01	5.8209E+00	6.8553E+03	3.2099E+00	0.000E+00	2.419E+00
5.478508E-01	2.19737E+01	5.4005E+00	5.9497E+03	3.3826E+00	0.000E+00	2.263E+00
5.856525E-01	2.19438E+01	5.0023E+00	5.1552E+03	3.5517E+00	0.000E+00	2.117E+00
6.260625E-01	2.18530E+01	4.6270E+00	4.4607E+03	3.7159E+00	0.000E+00	1.980E+00
6.692609E-01	2.16937E+01	4.2747E+00	3.8551E+03	3.8741E+00	0.000E+00	1.853E+00
7.154399E-01	2.14528E+01	3.9455E+00	3.3285E+03	4.0249E+00	0.000E+00	1.733E+00
7.648052E-01	2.11076E+01	3.6389E+00	2.8717E+03	4.1672E+00	0.000E+00	1.621E+00
8.175768E-01	2.06181E+01	3.3545E+00	2.4764E+03	4.2997E+00	0.000E+00	1.516E+00
8.739896E-01	1.99078E+01	3.0916E+00	2.1350E+03	4.4215E+00	0.000E+00	1.419E+00
9.342948E-01	1.88098E+01	2.8492E+00	1.8406E+03	4.5315E+00	0.000E+00	1.327E+00
9.987612E-01	1.68631E+01	2.6262E+00	1.5870E+03	4.6289E+00	0.000E+00	1.241E+00
1.067676E+00	1.17896E+01	2.3658E+00	1.3374E+03	4.7128E+00	0.000E+00	1.161E+00
1.093092E+00	6.31608E+00	2.2809E+00	1.2594E+03	4.7391E+00	0.000E+00	1.134E+00
1.109823E+00	-6.09692E+00	2.2279E+00	1.2116E+03	4.7552E+00	0.000E+00	1.117E+00
1.114285E+00	-2.36109E+01	2.2141E+00	1.1993E+03	4.7593E+00	0.000E+00	1.113E+00
1.119454E+00	-3.77946E+00	3.7930E+01	2.0450E+04	4.7640E+00	0.000E+00	1.108E+00
1.120977E+00	6.35636E-01	3.6469E+01	1.9636E+04	4.7653E+00	0.000E+00	1.106E+00
1.136589E+00	1.25769E+01	2.4595E+01	1.3061E+04	4.7789E+00	0.000E+00	1.091E+00
1.137708E+00	1.20159E+01	2.3926E+01	1.2693E+04	4.7798E+00	0.000E+00	1.090E+00
1.141345E+00	4.85956E+00	2.1888E+01	1.1575E+04	4.7828E+00	0.000E+00	1.086E+00
1.148012E+00	1.95529E+01	3.5478E+01	1.8652E+04	4.7882E+00	0.000E+00	1.080E+00
1.165146E+00	2.86670E+01	2.3290E+01	1.2065E+04	4.8015E+00	0.000E+00	1.064E+00
1.220098E+00	2.61155E+01	1.1349E+01	5.6143E+03	4.8383E+00	0.000E+00	1.016E+00
1.271746E+00	2.32928E+01	9.6933E+00	4.6004E+03	4.8653E+00	0.000E+00	9.749E-01
1.291212E+00	2.20861E+01	9.6070E+00	4.4907E+03	4.8738E+00	0.000E+00	9.602E-01
1.296402E+00	2.10685E+01	9.6017E+00	4.4702E+03	4.8759E+00	0.000E+00	9.564E-01
1.304285E+00	2.18654E+01	1.1425E+01	5.2868E+03	4.8789E+00	0.000E+00	9.506E-01
1.323654E+00	2.24467E+01	1.1485E+01	5.2369E+03	4.8859E+00	0.000E+00	9.367E-01
1.394281E+00	2.31148E+01	1.2088E+01	5.2325E+03	4.9045E+00	0.000E+00	8.892E-01
1.490486E+00	2.48384E+01	1.2851E+01	5.2039E+03	4.9150E+00	0.000E+00	8.318E-01
1.593529E+00	2.68351E+01	1.2542E+01	4.7511E+03	4.9105E+00	0.000E+00	7.781E-01
1.703269E+00	2.85622E+01	1.1639E+01	4.1244E+03	4.8912E+00	0.000E+00	7.279E-01
1.820795E+00	2.98015E+01	1.0374E+01	3.4389E+03	4.8575E+00	0.000E+00	6.809E-01
1.946430E+00	3.05339E+01	9.0590E+00	2.8091E+03	4.8098E+00	0.000E+00	6.370E-01
2.080733E+00	3.08856E+01	7.8777E+00	2.2851E+03	4.7488E+00	0.000E+00	5.959E-01
2.224304E+00	3.10084E+01	6.9076E+00	1.8744E+03	4.6751E+00	0.000E+00	5.574E-01
2.377781E+00	3.11872E+01	6.1906E+00	1.5714E+03	4.5896E+00	0.000E+00	5.214E-01
2.541848E+00	3.12271E+01	5.5690E+00	1.3223E+03	4.4931E+00	0.000E+00	4.878E-01
2.717235E+00	3.12946E+01	5.0076E+00	1.1123E+03	4.3866E+00	0.000E+00	4.563E-01

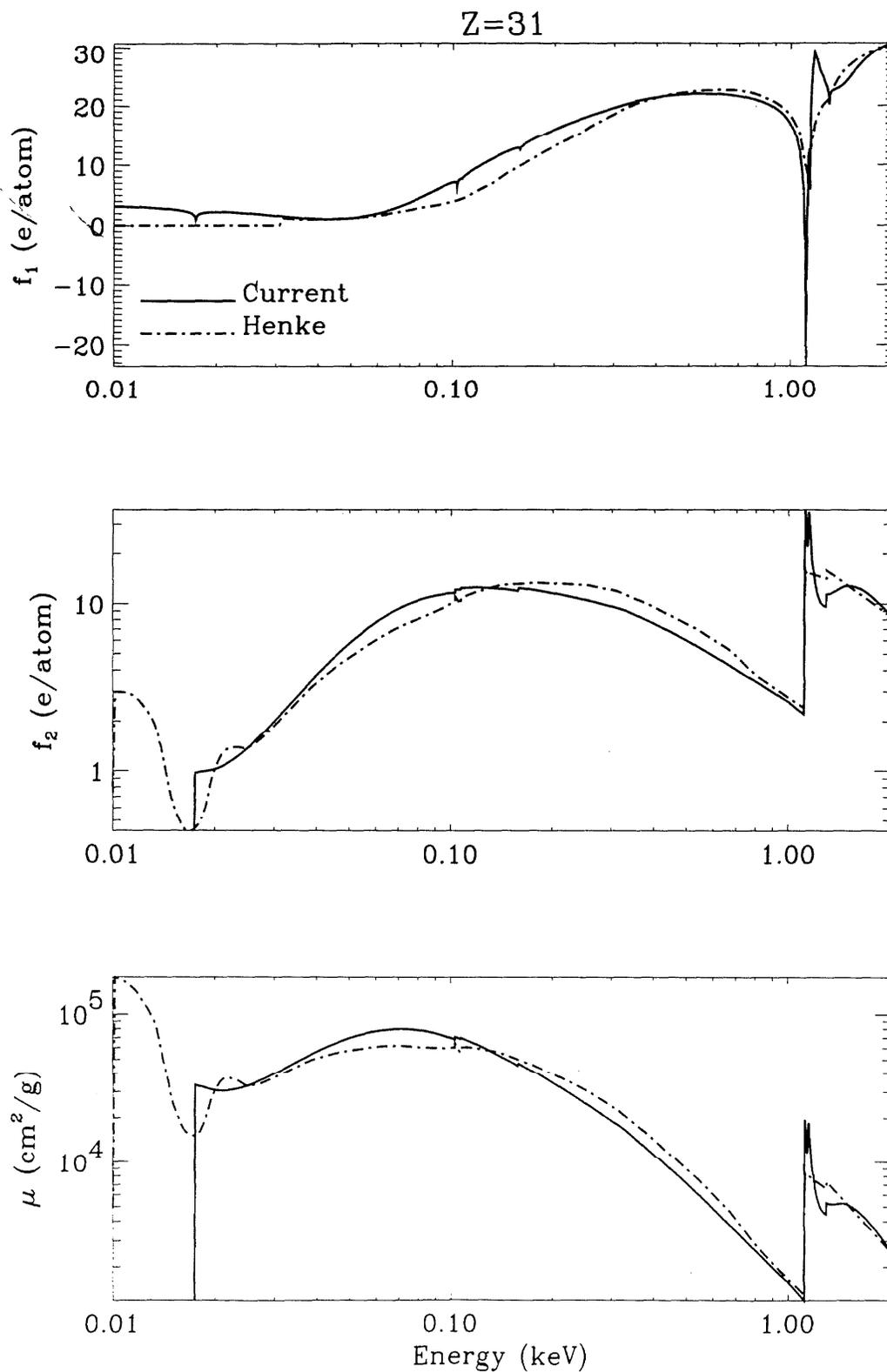
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 253

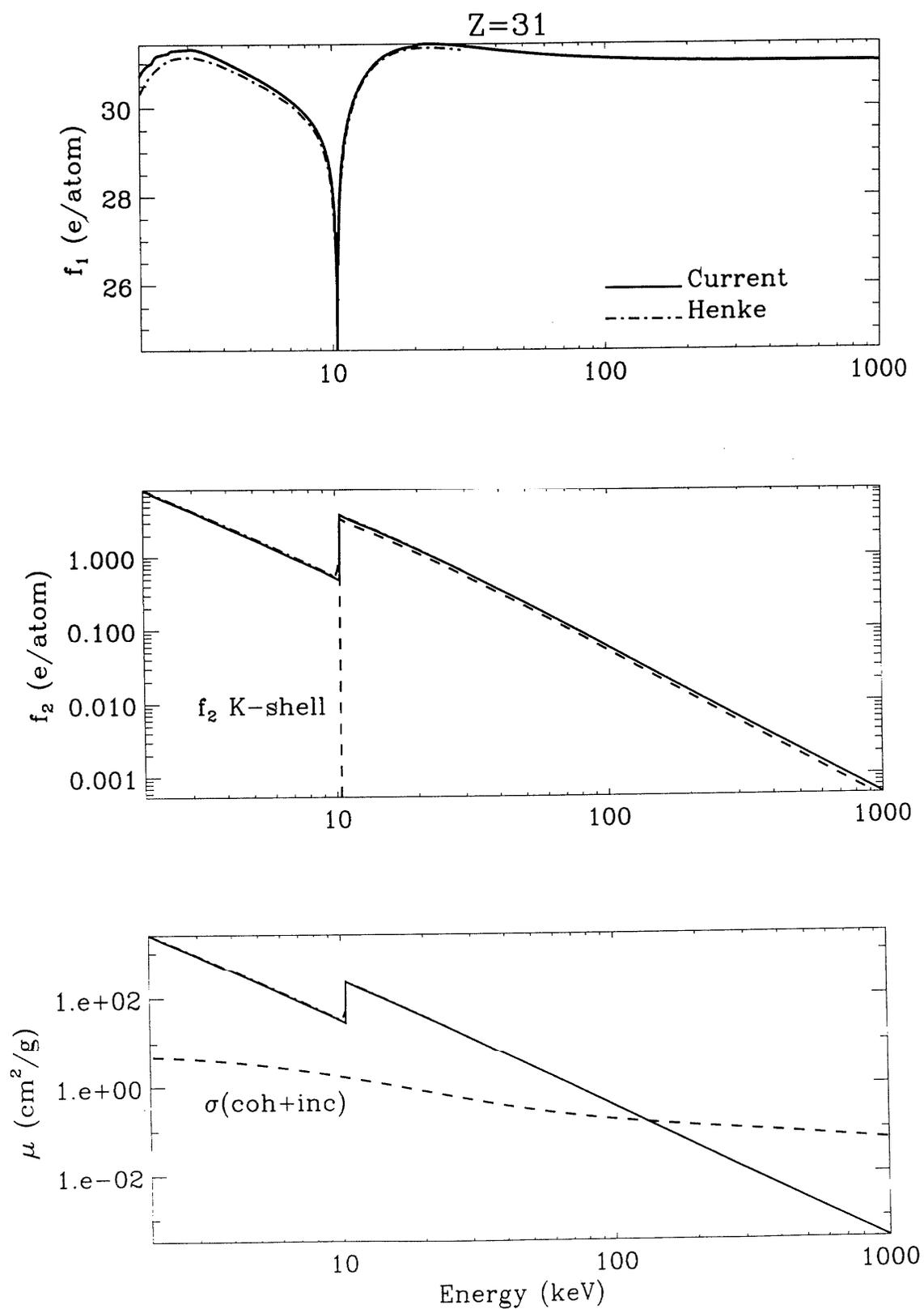
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
2.904724E+00	3.13044E+01	4.5040E+00	9.3587E+02	4.2711E+00	0.000E+00	4.268E-01
3.105150E+00	3.13166E+01	4.0282E+00	7.8299E+02	4.1475E+00	0.000E+00	3.993E-01
3.319406E+00	3.12769E+01	3.5844E+00	6.5175E+02	4.0170E+00	0.000E+00	3.735E-01
3.548445E+00	3.12118E+01	3.1923E+00	5.4299E+02	3.8806E+00	0.000E+00	3.494E-01
3.793288E+00	3.11330E+01	2.8457E+00	4.5279E+02	3.7394E+00	0.000E+00	3.269E-01
4.055024E+00	3.10461E+01	2.5390E+00	3.7792E+02	3.5944E+00	0.000E+00	3.058E-01
4.334821E+00	3.09547E+01	2.2675E+00	3.1572E+02	3.4466E+00	0.000E+00	2.860E-01
4.633924E+00	3.08614E+01	2.0270E+00	2.6401E+02	3.2970E+00	0.000E+00	2.676E-01
4.953664E+00	3.07678E+01	1.8105E+00	2.2060E+02	3.1466E+00	0.000E+00	2.503E-01
5.295467E+00	3.06690E+01	1.6105E+00	1.8356E+02	2.9962E+00	0.000E+00	2.341E-01
5.660855E+00	3.05651E+01	1.4337E+00	1.5286E+02	2.8466E+00	0.000E+00	2.190E-01
6.051453E+00	3.04544E+01	1.2717E+00	1.2683E+02	2.6986E+00	0.000E+00	2.049E-01
6.469004E+00	3.03344E+01	1.1290E+00	1.0534E+02	2.5530E+00	0.000E+00	1.917E-01
6.915365E+00	3.02036E+01	1.0033E+00	8.7567E+01	2.4103E+00	0.000E+00	1.793E-01
7.392525E+00	3.00569E+01	8.9248E-01	7.2866E+01	2.2711E+00	0.000E+00	1.677E-01
7.902609E+00	2.98851E+01	7.9466E-01	6.0692E+01	2.1359E+00	0.000E+00	1.569E-01
8.447890E+00	2.96694E+01	7.0823E-01	5.0600E+01	2.0050E+00	0.000E+00	1.468E-01
9.030794E+00	2.93678E+01	6.2937E-01	4.2063E+01	1.8789E+00	0.000E+00	1.373E-01
9.653919E+00	2.88162E+01	5.5215E-01	3.4520E+01	1.7578E+00	0.000E+00	1.284E-01
1.015976E+01	2.76480E+01	4.9982E-01	2.9693E+01	1.6686E+00	0.000E+00	1.220E-01
1.032004E+01	2.61338E+01	4.8485E-01	2.8356E+01	1.6419E+00	0.000E+00	1.201E-01
1.035673E+01	2.45278E+01	4.8152E-01	2.8062E+01	1.6358E+00	0.000E+00	1.197E-01
1.041894E+01	2.62749E+01	3.8431E+00	2.2263E+02	1.6257E+00	1.951E+02	1.190E-01
1.057444E+01	2.78546E+01	3.7266E+00	2.1271E+02	1.6009E+00	1.863E+02	1.172E-01
1.103212E+01	2.91935E+01	3.4259E+00	1.8743E+02	1.5313E+00	1.641E+02	1.124E-01
1.179334E+01	3.00256E+01	3.0603E+00	1.5662E+02	1.4263E+00	1.374E+02	1.051E-01
1.260708E+01	3.04757E+01	2.7550E+00	1.3189E+02	1.3268E+00	1.161E+02	9.834E-02
1.347697E+01	3.07777E+01	2.4874E+00	1.1140E+02	1.2328E+00	9.837E+01	9.200E-02
1.440688E+01	3.09902E+01	2.2265E+00	9.3277E+01	1.1442E+00	8.253E+01	8.606E-02
1.540095E+01	3.11350E+01	1.9894E+00	7.7963E+01	1.0611E+00	6.908E+01	8.050E-02
1.646362E+01	3.12343E+01	1.7746E+00	6.5056E+01	9.8330E-01	5.772E+01	7.531E-02
1.759961E+01	3.13007E+01	1.5811E+00	5.4223E+01	9.1063E-01	4.815E+01	7.045E-02
1.881398E+01	3.13433E+01	1.4080E+00	4.5170E+01	8.4295E-01	4.014E+01	6.590E-02
2.011215E+01	3.13689E+01	1.2538E+00	3.7627E+01	7.8008E-01	3.346E+01	6.165E-02
2.149988E+01	3.14186E+01	1.1143E+00	3.1282E+01	7.2181E-01	2.783E+01	5.767E-02
2.298338E+01	3.14203E+01	9.8861E-01	2.5962E+01	6.6794E-01	2.310E+01	5.395E-02
2.456923E+01	3.14148E+01	8.7706E-01	2.1546E+01	6.1825E-01	1.917E+01	5.046E-02
2.626450E+01	3.14053E+01	7.7807E-01	1.7880E+01	5.7251E-01	1.591E+01	4.721E-02
2.807676E+01	3.13918E+01	6.8692E-01	1.4767E+01	5.3049E-01	1.314E+01	4.416E-02
3.001405E+01	3.13739E+01	6.0523E-01	1.2171E+01	4.9197E-01	1.085E+01	4.131E-02
3.208502E+01	3.13537E+01	5.3330E-01	1.0032E+01	4.5671E-01	8.950E+00	3.864E-02
3.429889E+01	3.13325E+01	4.6995E-01	8.2698E+00	4.2450E-01	7.384E+00	3.615E-02
3.666551E+01	3.13111E+01	4.1415E-01	6.8174E+00	3.9512E-01	6.093E+00	3.381E-02
3.919543E+01	3.12898E+01	3.6500E-01	5.6205E+00	3.6836E-01	5.028E+00	3.163E-02
4.189992E+01	3.12693E+01	3.2170E-01	4.6340E+00	3.4400E-01	4.148E+00	2.959E-02
4.479101E+01	3.12498E+01	2.8355E-01	3.8208E+00	3.2187E-01	3.423E+00	2.768E-02
4.788159E+01	3.12310E+01	2.4851E-01	3.1326E+00	3.0177E-01	2.806E+00	2.589E-02
5.118542E+01	3.12126E+01	2.1775E-01	2.5677E+00	2.8353E-01	2.300E+00	2.422E-02
5.471721E+01	3.11950E+01	1.9081E-01	2.1048E+00	2.6698E-01	1.885E+00	2.266E-02
5.849270E+01	3.11784E+01	1.6721E-01	1.7254E+00	2.5196E-01	1.545E+00	2.120E-02
6.252870E+01	3.11628E+01	1.4653E-01	1.4144E+00	2.3834E-01	1.267E+00	1.983E-02
6.684318E+01	3.11484E+01	1.2842E-01	1.1596E+00	2.2597E-01	1.038E+00	1.855E-02
7.145536E+01	3.11350E+01	1.1255E-01	9.5066E-01	2.1473E-01	8.509E-01	1.735E-02
7.638578E+01	3.11228E+01	9.8642E-02	7.7942E-01	2.0451E-01	6.975E-01	1.623E-02
8.165640E+01	3.11117E+01	8.6354E-02	6.3828E-01	1.9519E-01	5.709E-01	1.518E-02
8.729069E+01	3.11012E+01	7.5397E-02	5.2132E-01	1.8669E-01	4.659E-01	1.420E-02
9.331374E+01	3.10915E+01	6.5833E-02	4.2581E-01	1.7890E-01	3.802E-01	1.329E-02
9.975239E+01	3.10826E+01	5.7485E-02	3.4782E-01	1.7176E-01	3.103E-01	1.243E-02
1.066353E+02	3.10745E+01	5.0197E-02	2.8412E-01	1.6518E-01	2.532E-01	1.163E-02
1.139931E+02	3.10671E+01	4.3834E-02	2.3209E-01	1.5910E-01	2.067E-01	1.088E-02
1.218587E+02	3.10604E+01	3.8280E-02	1.8960E-01	1.5347E-01	1.687E-01	1.017E-02
1.302669E+02	3.10543E+01	3.3430E-02	1.5489E-01	1.4822E-01	1.377E-01	9.518E-03
1.392553E+02	3.10488E+01	2.9196E-02	1.2654E-01	1.4331E-01	1.123E-01	8.903E-03
1.488640E+02	3.10438E+01	2.5499E-02	1.0338E-01	1.3870E-01	9.168E-02	8.329E-03
1.591356E+02	3.10392E+01	2.2271E-02	8.4467E-02	1.3435E-01	7.482E-02	7.791E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_x cm ² /g	λ nm
1.701159E+02	3.10352E+01	1.9452E-02	6.9014E-02	1.3022E-01	6.106E-02	7.288E-03
1.818539E+02	3.10315E+01	1.6990E-02	5.6390E-02	1.2630E-01	4.983E-02	6.818E-03
1.944018E+02	3.10282E+01	1.4841E-02	4.6077E-02	1.2255E-01	4.067E-02	6.378E-03
2.078156E+02	3.10252E+01	1.2964E-02	3.7651E-02	1.1895E-01	3.319E-02	5.966E-03
2.221548E+02	3.10225E+01	1.1324E-02	3.0767E-02	1.1548E-01	2.709E-02	5.581E-03
2.374835E+02	3.10201E+01	9.8927E-03	2.5142E-02	1.1213E-01	2.211E-02	5.221E-03
2.538699E+02	3.10180E+01	8.6422E-03	2.0546E-02	1.0888E-01	1.804E-02	4.884E-03
2.713869E+02	3.10161E+01	7.5501E-03	1.6791E-02	1.0573E-01	1.472E-02	4.569E-03
2.901126E+02	3.10143E+01	6.5961E-03	1.3723E-02	1.0265E-01	1.202E-02	4.274E-03
3.101304E+02	3.10128E+01	5.7629E-03	1.1215E-02	9.9647E-02	9.806E-03	3.998E-03
3.315294E+02	3.10114E+01	5.0350E-03	9.1665E-03	9.6711E-02	8.002E-03	3.740E-03
3.544049E+02	3.10101E+01	4.3993E-03	7.4921E-03	9.3836E-02	6.531E-03	3.498E-03
3.788588E+02	3.10090E+01	3.8439E-03	6.1237E-03	9.1019E-02	5.330E-03	3.273E-03
4.050001E+02	3.10080E+01	3.3587E-03	5.0054E-03	8.8255E-02	4.350E-03	3.061E-03
4.329451E+02	3.10072E+01	2.9349E-03	4.0914E-03	8.5542E-02	3.550E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 257

Ge Z = 32

Atomic weight = 7.259000E+01 g/mol, nominal density ρ (g/cm³) = 5.3070E+00

μ_0 (barns/atom) = μ (cm²/g) \times 1.20539E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 5.79699E+05

η edges. Edge energies (keV):

K		1.11031E+00	L	I	1.41430E+00	L	II	1.24780E+00	L	III	1.21670E+00
M	I	1.80000E-00	M	II	1.27900E-00	M	III	1.20800E-00	M	IV	2.87000E-02
M	V	2.87000E-02									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.7723E-01, -1.1160E-01 e/atom
 Nuclear Thomson correction f_{NT} = -7.7386E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	4.82331E+00	0.0000E+00	0.0000E+00	1.1051E-04	0.000E+00	1.160E+02
1.142761E-02	4.79856E+00	0.0000E+00	0.0000E+00	1.5183E-04	0.000E+00	1.085E+02
1.221612E-02	4.76990E+00	0.0000E+00	0.0000E+00	2.0744E-04	0.000E+00	1.015E+02
1.305903E-02	4.73664E+00	0.0000E+00	0.0000E+00	2.8186E-04	0.000E+00	9.494E+01
1.396010E-02	4.69793E+00	0.0000E+00	0.0000E+00	3.8087E-04	0.000E+00	8.881E+01
1.492335E-02	4.65272E+00	0.0000E+00	0.0000E+00	5.1187E-04	0.000E+00	8.308E+01
1.595306E-02	4.59971E+00	0.0000E+00	0.0000E+00	6.8420E-04	0.000E+00	7.772E+01
1.705382E-02	4.53719E+00	0.0000E+00	0.0000E+00	9.0963E-04	0.000E+00	7.270E+01
1.823053E-02	4.46296E+00	0.0000E+00	0.0000E+00	1.2029E-03	0.000E+00	6.801E+01
1.948844E-02	4.37397E+00	0.0000E+00	0.0000E+00	1.5823E-03	0.000E+00	6.362E+01
2.083314E-02	4.26589E+00	0.0000E+00	0.0000E+00	2.0703E-03	0.000E+00	5.951E+01
2.227063E-02	4.13200E+00	0.0000E+00	0.0000E+00	2.6947E-03	0.000E+00	5.567E+01
2.380730E-02	3.96079E+00	0.0000E+00	0.0000E+00	3.4891E-03	0.000E+00	5.208E+01
2.545001E-02	3.72818E+00	0.0000E+00	0.0000E+00	4.4944E-03	0.000E+00	4.872E+01
2.720606E-02	3.35842E+00	0.0000E+00	0.0000E+00	5.7597E-03	0.000E+00	4.557E+01
2.812600E-02	2.99548E+00	0.0000E+00	0.0000E+00	6.9051E-03	0.000E+00	4.408E+01
2.855650E-02	2.56016E+00	0.0000E+00	0.0000E+00	6.8742E-03	0.000E+00	4.342E+01
2.867130E-02	2.10442E+00	0.0000E+00	0.0000E+00	6.9748E-03	0.000E+00	4.324E+01
2.884350E-02	2.50915E+00	8.6030E-01	1.7290E+04	7.1274E-03	0.000E+00	4.299E+01
2.908327E-02	2.73980E+00	8.7594E-01	1.7459E+04	7.3435E-03	0.000E+00	4.263E+01
2.927400E-02	2.82322E+00	8.8848E-01	1.7594E+04	7.5183E-03	0.000E+00	4.235E+01
3.109002E-02	2.99292E+00	1.0128E+00	1.8885E+04	9.3153E-03	0.000E+00	3.988E+01
3.323523E-02	2.92695E+00	1.1767E+00	2.0524E+04	1.1757E-02	0.000E+00	3.731E+01
3.52846E-02	2.78960E+00	1.3852E+00	2.2602E+04	1.4765E-02	0.000E+00	3.490E+01
3.797993E-02	2.61993E+00	1.6451E+00	2.5110E+04	1.8451E-02	0.000E+00	3.264E+01
4.060054E-02	2.43542E+00	1.9627E+00	2.8023E+04	2.2942E-02	0.000E+00	3.054E+01
4.340198E-02	2.24947E+00	2.3438E+00	3.1304E+04	2.8388E-02	0.000E+00	2.857E+01
4.639671E-02	2.07531E+00	2.7932E+00	3.4899E+04	3.4955E-02	0.000E+00	2.672E+01
4.959809E-02	1.92706E+00	3.3138E+00	3.8731E+04	4.2834E-02	0.000E+00	2.500E+01
5.302035E-02	1.81991E+00	3.9058E+00	4.2704E+04	5.2237E-02	0.000E+00	2.338E+01
5.667876E-02	1.76967E+00	4.5662E+00	4.6702E+04	6.3401E-02	0.000E+00	2.187E+01
6.058959E-02	1.79203E+00	5.2882E+00	5.0596E+04	7.6588E-02	0.000E+00	2.046E+01
6.477028E-02	1.90158E+00	6.0612E+00	5.4248E+04	9.2084E-02	0.000E+00	1.914E+01
6.923942E-02	2.11068E+00	6.8707E+00	5.7524E+04	1.1020E-01	0.000E+00	1.791E+01
7.401695E-02	2.42839E+00	7.6989E+00	6.0297E+04	1.3127E-01	0.000E+00	1.675E+01
7.912411E-02	2.85949E+00	8.5256E+00	6.2462E+04	1.5565E-01	0.000E+00	1.567E+01
8.458368E-02	3.40364E+00	9.3292E+00	6.3938E+04	1.8372E-01	0.000E+00	1.466E+01
9.041995E-02	4.06865E+00	1.0088E+01	6.4674E+04	2.1587E-01	0.000E+00	1.371E+01
9.665893E-02	4.81459E+00	1.0780E+01	6.4653E+04	2.5252E-01	0.000E+00	1.283E+01
1.033284E-01	5.63462E+00	1.1388E+01	6.3890E+04	2.9407E-01	0.000E+00	1.200E+01
1.104581E-01	6.49340E+00	1.1896E+01	6.2430E+04	3.4094E-01	0.000E+00	1.122E+01
1.180797E-01	7.27992E+00	1.2289E+01	6.0330E+04	3.9355E-01	0.000E+00	1.050E+01
1.183840E-01	7.30144E+00	1.2301E+01	6.0236E+04	3.9570E-01	0.000E+00	1.047E+01
1.201960E-01	7.33901E+00	1.2370E+01	5.9660E+04	4.0858E-01	0.000E+00	1.032E+01
1.206792E-01	7.19222E+00	1.2387E+01	5.9502E+04	4.1203E-01	0.000E+00	1.027E+01
1.214040E-01	7.46831E+00	1.2806E+01	6.1149E+04	4.1723E-01	0.000E+00	1.021E+01
1.232160E-01	7.83726E+00	1.2880E+01	6.0595E+04	4.3031E-01	0.000E+00	1.006E+01
1.253420E-01	8.13535E+00	1.2956E+01	5.9922E+04	4.4581E-01	0.000E+00	9.892E+00
1.262272E-01	8.23834E+00	1.2985E+01	5.9635E+04	4.5231E-01	0.000E+00	9.822E+00
1.272605E-01	8.32672E+00	1.3017E+01	5.9297E+04	4.5993E-01	0.000E+00	9.743E+00
1.277721E-01	8.30406E+00	1.3032E+01	5.9128E+04	4.6371E-01	0.000E+00	9.704E+00
1.285395E-01	8.49560E+00	1.3234E+01	5.9686E+04	4.6941E-01	0.000E+00	9.646E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.304580E-01	8.82407E+00	1.3292E+01	5.9065E+04	4.8372E-01	0.000E+00	9.504E+00
1.349368E-01	9.44533E+00	1.3403E+01	5.7580E+04	5.1759E-01	0.000E+00	9.188E+00
1.442475E-01	1.05868E+01	1.3533E+01	5.4388E+04	5.8977E-01	0.000E+00	8.595E+00
1.542005E-01	1.16674E+01	1.3550E+01	5.0940E+04	6.6916E-01	0.000E+00	8.040E+00
1.648404E-01	1.26665E+01	1.3463E+01	4.7345E+04	7.5604E-01	0.000E+00	7.521E+00
1.762144E-01	1.34585E+01	1.3283E+01	4.3699E+04	8.5063E-01	0.000E+00	7.036E+00
1.764000E-01	1.34654E+01	1.3280E+01	4.3641E+04	8.5219E-01	0.000E+00	7.029E+00
1.791000E-01	1.34468E+01	1.3227E+01	4.2813E+04	8.7485E-01	0.000E+00	6.923E+00
1.798200E-01	1.32225E+01	1.3213E+01	4.2594E+04	8.8090E-01	0.000E+00	6.895E+00
1.809000E-01	1.35903E+01	1.3744E+01	4.4041E+04	8.8999E-01	0.000E+00	6.854E+00
1.836000E-01	1.40475E+01	1.3693E+01	4.3234E+04	9.1274E-01	0.000E+00	6.753E+00
1.883732E-01	1.45635E+01	1.3597E+01	4.1845E+04	9.5310E-01	0.000E+00	6.582E+00
2.013709E-01	1.56526E+01	1.3306E+01	3.8305E+04	1.0635E+00	0.000E+00	6.157E+00
2.152655E-01	1.66120E+01	1.2957E+01	3.4893E+04	1.1819E+00	0.000E+00	5.760E+00
2.301188E-01	1.74848E+01	1.2561E+01	3.1642E+04	1.3082E+00	0.000E+00	5.388E+00
2.459970E-01	1.82815E+01	1.2127E+01	2.8577E+04	1.4421E+00	0.000E+00	5.040E+00
2.629708E-01	1.90067E+01	1.1665E+01	2.5714E+04	1.5835E+00	0.000E+00	4.715E+00
2.811158E-01	1.96640E+01	1.1182E+01	2.3060E+04	1.7318E+00	0.000E+00	4.410E+00
3.005128E-01	2.02567E+01	1.0687E+01	2.0616E+04	1.8867E+00	0.000E+00	4.126E+00
3.212482E-01	2.07880E+01	1.0186E+01	1.8380E+04	2.0475E+00	0.000E+00	3.859E+00
3.434143E-01	2.12611E+01	9.6827E+00	1.6345E+04	2.2135E+00	0.000E+00	3.610E+00
3.671099E-01	2.16795E+01	9.1826E+00	1.4500E+04	2.3838E+00	0.000E+00	3.377E+00
3.924405E-01	2.20431E+01	8.6892E+00	1.2835E+04	2.5576E+00	0.000E+00	3.159E+00
4.195189E-01	2.23602E+01	8.2053E+00	1.1338E+04	2.7339E+00	0.000E+00	2.955E+00
4.484657E-01	2.26310E+01	7.7335E+00	9.9965E+03	2.9115E+00	0.000E+00	2.765E+00
4.794098E-01	2.28586E+01	7.2755E+00	8.7975E+03	3.0892E+00	0.000E+00	2.586E+00
5.124891E-01	2.30456E+01	6.8320E+00	7.7280E+03	3.2660E+00	0.000E+00	2.419E+00
5.478508E-01	2.31952E+01	6.3846E+00	6.7557E+03	3.4405E+00	0.000E+00	2.263E+00
5.856525E-01	2.32789E+01	5.9027E+00	5.8427E+03	3.6114E+00	0.000E+00	2.117E+00
6.260625E-01	2.32910E+01	5.4478E+00	5.0444E+03	3.7774E+00	0.000E+00	1.980E+00
6.692609E-01	2.32338E+01	5.0209E+00	4.3490E+03	3.9374E+00	0.000E+00	1.853E+00
7.154399E-01	2.31045E+01	4.6224E+00	3.7454E+03	4.0899E+00	0.000E+00	1.733E+00
7.648052E-01	2.28946E+01	4.2519E+00	3.2228E+03	4.2338E+00	0.000E+00	1.621E+00
8.175768E-01	2.25869E+01	3.9088E+00	2.7715E+03	4.3680E+00	0.000E+00	1.516E+00
8.739896E-01	2.21496E+01	3.5923E+00	2.3827E+03	4.4913E+00	0.000E+00	1.419E+00
9.342948E-01	2.15225E+01	3.3015E+00	2.0485E+03	4.6029E+00	0.000E+00	1.327E+00
9.987612E-01	2.05792E+01	3.0350E+00	1.7616E+03	4.7017E+00	0.000E+00	1.241E+00
1.067676E+00	1.90595E+01	2.7270E+00	1.4806E+03	4.7871E+00	0.000E+00	1.161E+00
1.141345E+00	1.56129E+01	2.4534E+00	1.2461E+03	4.8585E+00	0.000E+00	1.086E+00
1.192366E+00	8.11885E+00	2.2913E+00	1.1140E+03	4.8974E+00	0.000E+00	1.040E+00
1.210616E+00	-3.86651E+00	2.2379E+00	1.0716E+03	4.9094E+00	0.000E+00	1.024E+00
1.215483E+00	-2.08094E+01	2.2240E+00	1.0607E+03	4.9125E+00	0.000E+00	1.020E+00
1.220098E+00	-5.15984E+00	3.7725E+01	1.7924E+04	4.9153E+00	0.000E+00	1.016E+00
1.228444E+00	2.85035E+00	3.5368E+01	1.6766E+04	4.9169E+00	0.000E+00	1.014E+00
1.241561E+00	1.47120E+01	2.3036E+01	1.0756E+04	4.9277E+00	0.000E+00	9.986E-01
1.246552E+00	7.98782E+00	2.0622E+01	9.5899E+03	4.9304E+00	0.000E+00	9.946E-01
1.254039E+00	2.09940E+01	3.3772E+01	1.5611E+04	4.9343E+00	0.000E+00	9.887E-01
1.272756E+00	2.95143E+01	2.2269E+01	1.0143E+04	4.9436E+00	0.000E+00	9.741E-01
1.304285E+00	2.90267E+01	1.3776E+01	6.1229E+03	4.9572E+00	0.000E+00	9.506E-01
1.386014E+00	2.44972E+01	9.5723E+00	4.0036E+03	4.9821E+00	0.000E+00	8.945E-01
1.394281E+00	2.41206E+01	9.5221E+00	3.9590E+03	4.9839E+00	0.000E+00	8.892E-01
1.407228E+00	2.32805E+01	9.4782E+00	3.9045E+03	4.9864E+00	0.000E+00	8.811E-01
1.412886E+00	2.22441E+01	9.4709E+00	3.8858E+03	4.9874E+00	0.000E+00	8.775E-01
1.421371E+00	2.30612E+01	1.1331E+01	4.6214E+03	4.9888E+00	0.000E+00	8.723E-01
1.442586E+00	2.36767E+01	1.1374E+01	4.5707E+03	4.9917E+00	0.000E+00	8.595E-01
1.490486E+00	2.40906E+01	1.1669E+01	4.5384E+03	4.9955E+00	0.000E+00	8.318E-01
1.593329E+00	2.54700E+01	1.2579E+01	4.5768E+03	4.9919E+00	0.000E+00	7.781E-01
1.703269E+00	2.74900E+01	1.2458E+01	4.2400E+03	4.9734E+00	0.000E+00	7.279E-01
1.820795E+00	2.92523E+01	1.1673E+01	3.7164E+03	4.9404E+00	0.000E+00	6.809E-01
1.946430E+00	3.05657E+01	1.0483E+01	3.1221E+03	4.8933E+00	0.000E+00	6.370E-01
2.080733E+00	3.13709E+01	9.1973E+00	2.5624E+03	4.8327E+00	0.000E+00	5.959E-01
2.224304E+00	3.17829E+01	8.0290E+00	2.0925E+03	4.7594E+00	0.000E+00	5.574E-01
2.377781E+00	3.19568E+01	7.0563E+00	1.7203E+03	4.6740E+00	0.000E+00	5.214E-01
2.541848E+00	3.21710E+01	6.3009E+00	1.4370E+03	4.5775E+00	0.000E+00	4.878E-01
2.717235E+00	3.22297E+01	5.6680E+00	1.2092E+03	4.4707E+00	0.000E+00	4.563E-01

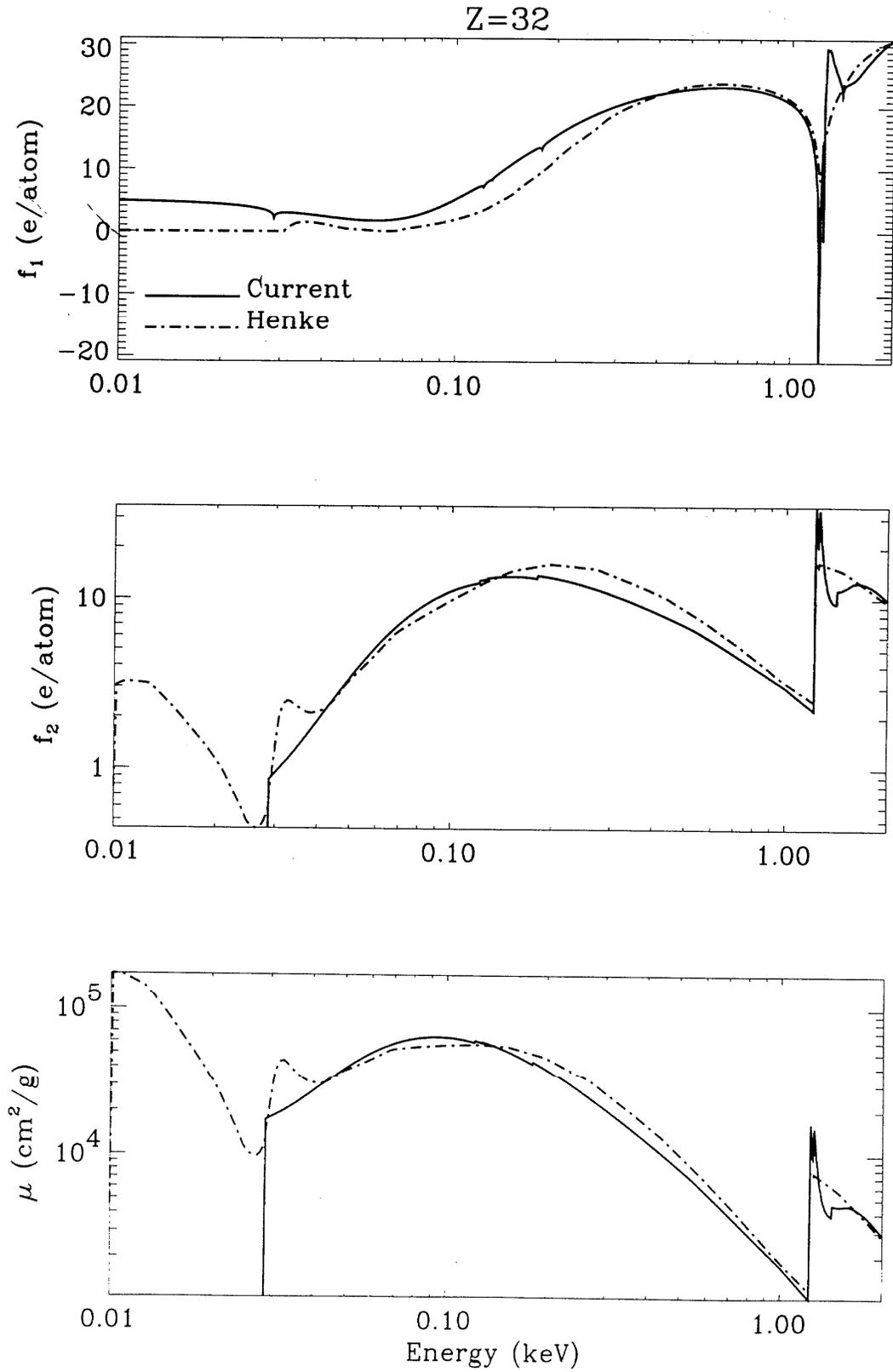
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 259

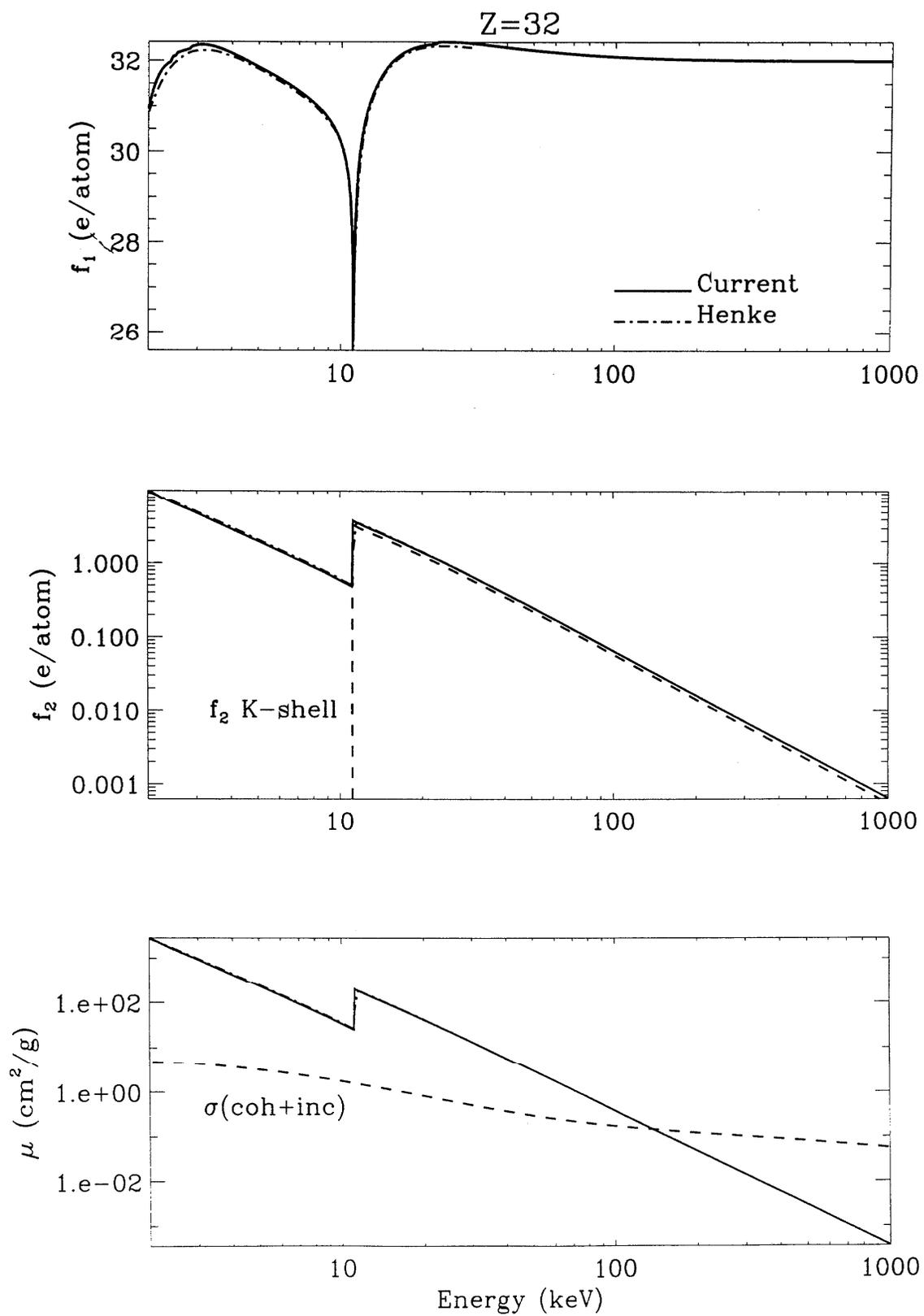
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.904724E+00	3.23205E+01	5.1003E+00	1.0179E+03	4.3548E+00	0.000E+00	4.268E-01
3.105150E+00	3.23542E+01	4.5607E+00	8.5144E+02	4.2307E+00	0.000E+00	3.993E-01
3.319406E+00	3.23348E+01	4.0582E+00	7.0872E+02	4.0994E+00	0.000E+00	3.735E-01
3.548445E+00	3.22862E+01	3.6131E+00	5.9027E+02	3.9621E+00	0.000E+00	3.494E-01
3.793288E+00	3.22190E+01	3.2194E+00	4.9199E+02	3.8198E+00	0.000E+00	3.269E-01
4.055024E+00	3.21399E+01	2.8711E+00	4.1045E+02	3.6735E+00	0.000E+00	3.058E-01
4.334821E+00	3.20534E+01	2.5629E+00	3.4274E+02	3.5242E+00	0.000E+00	2.860E-01
4.633924E+00	3.19625E+01	2.2899E+00	2.8646E+02	3.3731E+00	0.000E+00	2.676E-01
4.953664E+00	3.18695E+01	2.0479E+00	2.3966E+02	3.2209E+00	0.000E+00	2.503E-01
5.295467E+00	3.17763E+01	1.8327E+00	2.0063E+02	3.0686E+00	0.000E+00	2.341E-01
5.660855E+00	3.16800E+01	1.6321E+00	1.6713E+02	2.9170E+00	0.000E+00	2.190E-01
6.051453E+00	3.15777E+01	1.4543E+00	1.3931E+02	2.7669E+00	0.000E+00	2.049E-01
6.469004E+00	3.14698E+01	1.2918E+00	1.1576E+02	2.6190E+00	0.000E+00	1.917E-01
6.915365E+00	3.13523E+01	1.1474E+00	9.6180E+01	2.4740E+00	0.000E+00	1.793E-01
7.392525E+00	3.12238E+01	1.0201E+00	7.9991E+01	2.3324E+00	0.000E+00	1.677E-01
7.902609E+00	3.10798E+01	9.0777E-01	6.6590E+01	2.1947E+00	0.000E+00	1.569E-01
8.447890E+00	3.09116E+01	8.0862E-01	5.5488E+01	2.0614E+00	0.000E+00	1.468E-01
9.030794E+00	3.07014E+01	7.1829E-01	4.6108E+01	1.9327E+00	0.000E+00	1.373E-01
9.653919E+00	3.03972E+01	6.3015E-01	3.7839E+01	1.8090E+00	0.000E+00	1.284E-01
1.032004E+01	2.98588E+01	5.5335E-01	3.1083E+01	1.6906E+00	0.000E+00	1.201E-01
1.088104E+01	2.86740E+01	4.9947E-01	2.6610E+01	1.6004E+00	0.000E+00	1.139E-01
1.103212E+01	2.75223E+01	4.8636E-01	2.5557E+01	1.5775E+00	0.000E+00	1.124E-01
1.104758E+01	2.72677E+01	4.8505E-01	2.5452E+01	1.5752E+00	0.000E+00	1.122E-01
1.109200E+01	2.55686E+01	4.8132E-01	2.5155E+01	1.5686E+00	0.000E+00	1.118E-01
1.115862E+01	2.73085E+01	3.8275E+00	1.9884E+02	1.5587E+00	1.741E+02	1.111E-01
1.132516E+01	2.88815E+01	3.7099E+00	1.8990E+02	1.5346E+00	1.662E+02	1.095E-01
1.179334E+01	3.01773E+01	3.4186E+00	1.6804E+02	1.4699E+00	1.470E+02	1.051E-01
1.260708E+01	3.10210E+01	3.0517E+00	1.4032E+02	1.3679E+00	1.230E+02	9.834E-02
1.347697E+01	3.14728E+01	2.7472E+00	1.1817E+02	1.2715E+00	1.039E+02	9.200E-02
1.440688E+01	3.17750E+01	2.4811E+00	9.9832E+01	1.1806E+00	8.804E+01	8.606E-02
1.540095E+01	3.19885E+01	2.2215E+00	8.3619E+01	1.0951E+00	7.388E+01	8.050E-02
1.646362E+01	3.21337E+01	1.9850E+00	6.9892E+01	1.0150E+00	6.184E+01	7.531E-02
1.759961E+01	3.22331E+01	1.7706E+00	5.8321E+01	9.4016E-01	5.166E+01	7.045E-02
1.881398E+01	3.22995E+01	1.5776E+00	4.8611E+01	8.7037E-01	4.309E+01	6.590E-02
2.011215E+01	3.23420E+01	1.4050E+00	4.0497E+01	8.0547E-01	3.593E+01	6.165E-02
2.149988E+01	3.23676E+01	1.2513E+00	3.3739E+01	7.4527E-01	2.995E+01	5.767E-02
2.298338E+01	3.24172E+01	1.1127E+00	2.8064E+01	6.8955E-01	2.492E+01	5.395E-02
2.456923E+01	3.24194E+01	9.8771E-01	2.3305E+01	6.3810E-01	2.069E+01	5.046E-02
2.626450E+01	3.24148E+01	8.7684E-01	1.9353E+01	5.9069E-01	1.718E+01	4.721E-02
2.807676E+01	3.24060E+01	7.7457E-01	1.5993E+01	5.4710E-01	1.420E+01	4.416E-02
3.001403E+01	3.23910E+01	6.8320E-01	1.3195E+01	5.0710E-01	1.172E+01	4.131E-02
3.208502E+01	3.23726E+01	6.0227E-01	1.0882E+01	4.7046E-01	9.679E+00	3.864E-02
3.429889E+01	3.23523E+01	5.3094E-01	8.9736E+00	4.3695E-01	7.991E+00	3.615E-02
3.666551E+01	3.23310E+01	4.6809E-01	7.4007E+00	4.0635E-01	6.597E+00	3.381E-02
3.919543E+01	3.23095E+01	4.1271E-01	6.1039E+00	3.7845E-01	5.446E+00	3.163E-02
4.189992E+01	3.22884E+01	3.6390E-01	5.0346E+00	3.5305E-01	4.496E+00	2.959E-02
4.479101E+01	3.22679E+01	3.2088E-01	4.1529E+00	3.2995E-01	3.711E+00	2.768E-02
4.788159E+01	3.22485E+01	2.8296E-01	3.4258E+00	3.0895E-01	3.064E+00	2.589E-02
5.118542E+01	3.22299E+01	2.4813E-01	2.8102E+00	2.8989E-01	2.513E+00	2.422E-02
5.471721E+01	3.22116E+01	2.1750E-01	2.3043E+00	2.7258E-01	2.061E+00	2.266E-02
5.849270E+01	3.21942E+01	1.9066E-01	1.8896E+00	2.5687E-01	1.690E+00	2.120E-02
6.252870E+01	3.21777E+01	1.6714E-01	1.5495E+00	2.4262E-01	1.385E+00	1.983E-02
6.684318E+01	3.21623E+01	1.4652E-01	1.2707E+00	2.2968E-01	1.136E+00	1.855E-02
7.145536E+01	3.21479E+01	1.2846E-01	1.0421E+00	2.1792E-01	9.314E-01	1.735E-02
7.638578E+01	3.21347E+01	1.1262E-01	8.5469E-01	2.0722E-01	7.637E-01	1.623E-02
8.165640E+01	3.21226E+01	9.8633E-02	7.0022E-01	1.9748E-01	6.254E-01	1.518E-02
8.729069E+01	3.21112E+01	8.6170E-02	5.7226E-01	1.8860E-01	5.107E-01	1.420E-02
9.331374E+01	3.21007E+01	7.5285E-02	4.6770E-01	1.8047E-01	4.171E-01	1.329E-02
9.975239E+01	3.20911E+01	6.5777E-02	3.8226E-01	1.7302E-01	3.406E-01	1.243E-02
1.066353E+02	3.20822E+01	5.7472E-02	3.1244E-01	1.6617E-01	2.781E-01	1.163E-02
1.139931E+02	3.20741E+01	5.0218E-02	2.5538E-01	1.5986E-01	2.271E-01	1.088E-02
1.218587E+02	3.20668E+01	4.3881E-02	2.0875E-01	1.5401E-01	1.855E-01	1.017E-02
1.302669E+02	3.20601E+01	3.8345E-02	1.7064E-01	1.4858E-01	1.515E-01	9.518E-03
1.392553E+02	3.20540E+01	3.3509E-02	1.3949E-01	1.4351E-01	1.237E-01	8.903E-03
1.488640E+02	3.20485E+01	2.9283E-02	1.1403E-01	1.3876E-01	1.010E-01	8.329E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.591356E+02	3.20436E+01	2.5591E-02	9.3225E-02	1.3429E-01	8.250E-02	7.791E-03
1.701159E+02	3.20391E+01	2.2366E-02	7.6216E-02	1.3007E-01	6.737E-02	7.288E-03
1.818539E+02	3.20350E+01	1.9548E-02	6.2312E-02	1.2606E-01	5.502E-02	6.818E-03
1.944018E+02	3.20314E+01	1.7085E-02	5.0946E-02	1.2224E-01	4.493E-02	6.378E-03
2.078156E+02	3.20281E+01	1.4933E-02	4.1655E-02	1.1858E-01	3.669E-02	5.966E-03
2.221548E+02	3.20251E+01	1.3053E-02	3.4060E-02	1.1507E-01	2.996E-02	5.581E-03
2.374835E+02	3.20225E+01	1.1409E-02	2.7850E-02	1.1168E-01	2.447E-02	5.221E-03
2.538699E+02	3.20201E+01	9.9731E-03	2.2773E-02	1.0841E-01	1.998E-02	4.884E-03
2.713869E+02	3.20179E+01	8.7180E-03	1.8622E-02	1.0523E-01	1.632E-02	4.569E-03
2.901126E+02	3.20160E+01	7.6211E-03	1.5228E-02	1.0215E-01	1.333E-02	4.274E-03
3.101304E+02	3.20143E+01	6.6625E-03	1.2454E-02	9.9141E-02	1.088E-02	3.998E-03
3.315294E+02	3.20128E+01	5.8245E-03	1.0185E-02	9.6207E-02	8.887E-03	3.740E-03
3.544049E+02	3.20114E+01	5.0922E-03	8.3292E-03	9.3339E-02	7.257E-03	3.498E-03
3.788588E+02	3.20101E+01	4.4520E-03	6.8121E-03	9.0532E-02	5.927E-03	3.273E-03
4.050001E+02	3.20090E+01	3.8924E-03	5.5715E-03	8.7782E-02	4.840E-03	3.061E-03
4.329451E+02	3.20080E+01	3.4033E-03	4.5569E-03	8.5086E-02	3.952E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 263

As Z = 33

Atomic weight = 7.492160E+01 g/mol, nominal density ρ (g/cm³) = 5.7200E+00

$\mu_{\text{atoms}}/\text{atom} = \mu(\text{cm}^2/\text{g}) \times 1.24410\text{E}+02$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e}/\text{atom}) \times 5.61658\text{E}+05$

Edges. Edge energies (keV):

K		1.18667E+00	L	I	1.52650E+00	L	II	1.35860E+00	L	III	1.32310E+00
M	I	2.03500E-00	M	II	1.46400E-00	M	III	1.40500E-00	M	IV	4.12000E-02
M	V	4.12000E-02									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.9087E-01, -1.2000E-01 e/atom

Nuclear Thomson correction $f_{\text{NT}} = -7.9737\text{E}-03$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.06900E-02	5.97388E+00	0.0000E+00	0.0000E+00	1.2935E-04	0.000E+00	1.160E+02
1.142761E-02	5.95892E+00	0.0000E+00	0.0000E+00	1.7697E-04	0.000E+00	1.085E+02
1.221612E-02	5.94172E+00	0.0000E+00	0.0000E+00	2.4079E-04	0.000E+00	1.015E+02
1.305903E-02	5.92193E+00	0.0000E+00	0.0000E+00	3.2586E-04	0.000E+00	9.494E+01
1.396010E-02	5.89914E+00	0.0000E+00	0.0000E+00	4.3861E-04	0.000E+00	8.881E+01
1.492335E-02	5.87286E+00	0.0000E+00	0.0000E+00	5.8719E-04	0.000E+00	8.308E+01
1.595306E-02	5.84252E+00	0.0000E+00	0.0000E+00	7.8193E-04	0.000E+00	7.772E+01
1.705382E-02	5.80742E+00	0.0000E+00	0.0000E+00	1.0357E-03	0.000E+00	7.270E+01
1.823053E-02	5.76673E+00	0.0000E+00	0.0000E+00	1.3647E-03	0.000E+00	6.801E+01
1.948844E-02	5.71947E+00	0.0000E+00	0.0000E+00	1.7888E-03	0.000E+00	6.362E+01
2.083314E-02	5.66438E+00	0.0000E+00	0.0000E+00	2.3324E-03	0.000E+00	5.951E+01
2.227063E-02	5.59995E+00	0.0000E+00	0.0000E+00	3.0256E-03	0.000E+00	5.567E+01
2.380730E-02	5.52424E+00	0.0000E+00	0.0000E+00	3.9047E-03	0.000E+00	5.208E+01
2.545001E-02	5.43479E+00	0.0000E+00	0.0000E+00	5.0136E-03	0.000E+00	4.872E+01
2.720606E-02	5.32828E+00	0.0000E+00	0.0000E+00	6.4047E-03	0.000E+00	4.557E+01
2.908327E-02	5.20019E+00	0.0000E+00	0.0000E+00	8.1408E-03	0.000E+00	4.263E+01
3.109002E-02	5.04396E+00	0.0000E+00	0.0000E+00	1.0296E-02	0.000E+00	3.988E+01
3.323523E-02	4.84923E+00	0.0000E+00	0.0000E+00	1.2957E-02	0.000E+00	3.731E+01
3.552846E-02	4.59747E+00	0.0000E+00	0.0000E+00	1.6225E-02	0.000E+00	3.490E+01
3.797993E-02	4.24541E+00	0.0000E+00	0.0000E+00	2.0218E-02	0.000E+00	3.264E+01
4.037600E-02	3.66212E+00	0.0000E+00	0.0000E+00	2.4632E-02	0.000E+00	3.071E+01
4.060054E-02	3.56057E+00	0.0000E+00	0.0000E+00	2.5072E-02	0.000E+00	3.054E+01
4.099400E-02	3.26814E+00	0.0000E+00	0.0000E+00	2.5854E-02	0.000E+00	3.024E+01
4.115880E-02	2.89512E+00	0.0000E+00	0.0000E+00	2.6185E-02	0.000E+00	3.012E+01
4.140600E-02	3.18075E+00	6.7799E-01	9.1967E+03	2.6687E-02	0.000E+00	2.994E+01
4.202400E-02	3.36584E+00	7.2651E-01	9.7099E+03	2.7966E-02	0.000E+00	2.950E+01
4.340198E-02	3.36274E+00	8.4453E-01	1.0929E+04	3.0941E-02	0.000E+00	2.857E+01
4.639671E-02	3.13444E+00	1.1515E+00	1.3940E+04	3.8000E-02	0.000E+00	2.672E+01
4.959809E-02	2.84875E+00	1.5444E+00	1.7489E+04	4.6449E-02	0.000E+00	2.500E+01
5.302035E-02	2.55769E+00	2.0278E+00	2.1481E+04	5.6507E-02	0.000E+00	2.338E+01
5.667876E-02	2.28864E+00	2.6072E+00	2.5836E+04	6.8422E-02	0.000E+00	2.187E+01
6.058959E-02	2.06592E+00	3.2835E+00	3.0438E+04	8.2462E-02	0.000E+00	2.046E+01
6.477028E-02	1.91310E+00	4.0522E+00	3.5139E+04	9.8924E-02	0.000E+00	1.914E+01
6.923942E-02	1.85256E+00	4.9031E+00	3.9773E+04	1.1813E-01	0.000E+00	1.791E+01
7.401695E-02	1.90410E+00	5.8203E+00	4.4166E+04	1.4042E-01	0.000E+00	1.675E+01
7.912411E-02	2.08345E+00	6.7827E+00	4.8146E+04	1.6616E-01	0.000E+00	1.567E+01
8.458368E-02	2.40093E+00	7.7653E+00	5.1564E+04	1.9573E-01	0.000E+00	1.466E+01
9.041995E-02	2.86035E+00	8.7406E+00	5.4293E+04	2.2954E-01	0.000E+00	1.371E+01
9.665893E-02	3.45832E+00	9.6801E+00	5.6248E+04	2.6800E-01	0.000E+00	1.283E+01
1.033284E-01	4.18397E+00	1.0556E+01	5.7381E+04	3.1153E-01	0.000E+00	1.200E+01
1.104581E-01	5.01853E+00	1.1345E+01	5.7686E+04	3.6056E-01	0.000E+00	1.122E+01
1.180797E-01	5.93419E+00	1.2024E+01	5.7192E+04	4.1550E-01	0.000E+00	1.050E+01
1.262272E-01	6.88034E+00	1.2577E+01	5.5963E+04	4.7675E-01	0.000E+00	9.822E+00
1.349368E-01	7.77925E+00	1.2994E+01	5.4086E+04	5.4471E-01	0.000E+00	9.188E+00
1.376900E-01	7.98349E+00	1.3092E+01	5.3405E+04	5.6665E-01	0.000E+00	9.005E+00
1.397975E-01	7.99944E+00	1.3158E+01	5.2862E+04	5.8359E-01	0.000E+00	8.869E+00
1.403595E-01	7.81981E+00	1.3174E+01	5.2715E+04	5.8813E-01	0.000E+00	8.833E+00
1.412025E-01	8.12885E+00	1.3658E+01	5.4328E+04	5.9495E-01	0.000E+00	8.781E+00
1.433100E-01	8.52176E+00	1.3733E+01	5.3823E+04	6.1207E-01	0.000E+00	8.651E+00
1.434720E-01	8.54386E+00	1.3739E+01	5.3784E+04	6.1339E-01	0.000E+00	8.642E+00
1.442475E-01	8.64108E+00	1.3765E+01	5.3595E+04	6.1972E-01	0.000E+00	8.595E+00
1.456680E-01	8.77001E+00	1.3809E+01	5.3245E+04	6.3135E-01	0.000E+00	8.511E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.462536E-01	8.74386E+00	1.3827E+01	5.3100E+04	6.3616E-01	0.000E+00	8.477E+00
1.471320E-01	8.95813E+00	1.4057E+01	5.3660E+04	6.4339E-01	0.000E+00	8.427E+00
1.493280E-01	9.32082E+00	1.4127E+01	5.3134E+04	6.6153E-01	0.000E+00	8.303E+00
1.542005E-01	9.96447E+00	1.4262E+01	5.1947E+04	7.0211E-01	0.000E+00	8.040E+00
1.648404E-01	1.12098E+01	1.4463E+01	4.9280E+04	7.9216E-01	0.000E+00	7.521E+00
1.762144E-01	1.24105E+01	1.4537E+01	4.6334E+04	8.9007E-01	0.000E+00	7.036E+00
1.883732E-01	1.35313E+01	1.4477E+01	4.3165E+04	9.9599E-01	0.000E+00	6.582E+00
1.994300E-01	1.42923E+01	1.4330E+01	4.0359E+04	1.0929E+00	0.000E+00	6.217E+00
2.013709E-01	1.43350E+01	1.4297E+01	3.9878E+04	1.1100E+00	0.000E+00	6.157E+00
2.024825E-01	1.42878E+01	1.4278E+01	3.9604E+04	1.1198E+00	0.000E+00	6.123E+00
2.032965E-01	1.40489E+01	1.4263E+01	3.9405E+04	1.1269E+00	0.000E+00	6.099E+00
2.045175E-01	1.44540E+01	1.4839E+01	4.0753E+04	1.1376E+00	0.000E+00	6.062E+00
2.075700E-01	1.49650E+01	1.4787E+01	4.0010E+04	1.1645E+00	0.000E+00	5.973E+00
2.152655E-01	1.57674E+01	1.4637E+01	3.8189E+04	1.2321E+00	0.000E+00	5.760E+00
2.301188E-01	1.69797E+01	1.4296E+01	3.4892E+04	1.3621E+00	0.000E+00	5.388E+00
2.459970E-01	1.80578E+01	1.3877E+01	3.1684E+04	1.5000E+00	0.000E+00	5.040E+00
2.629708E-01	1.90331E+01	1.3395E+01	2.8609E+04	1.6453E+00	0.000E+00	4.715E+00
2.811158E-01	1.99130E+01	1.2864E+01	2.5702E+04	1.7977E+00	0.000E+00	4.410E+00
3.005128E-01	2.07016E+01	1.2298E+01	2.2984E+04	1.9566E+00	0.000E+00	4.126E+00
3.212482E-01	2.14026E+01	1.1708E+01	2.0471E+04	2.1214E+00	0.000E+00	3.859E+00
3.434143E-01	2.20202E+01	1.1107E+01	1.8165E+04	2.2915E+00	0.000E+00	3.610E+00
3.671099E-01	2.25590E+01	1.0502E+01	1.6067E+04	2.4658E+00	0.000E+00	3.377E+00
3.924405E-01	2.30240E+01	9.9010E+00	1.4170E+04	2.6436E+00	0.000E+00	3.159E+00
4.195189E-01	2.34203E+01	9.3104E+00	1.2465E+04	2.8237E+00	0.000E+00	2.955E+00
4.484657E-01	2.37497E+01	8.7349E+00	1.0940E+04	3.0052E+00	0.000E+00	2.765E+00
4.794098E-01	2.40227E+01	8.1779E+00	9.5810E+03	3.1867E+00	0.000E+00	2.586E+00
5.124891E-01	2.42405E+01	7.6422E+00	8.3754E+03	3.3670E+00	0.000E+00	2.419E+00
5.478508E-01	2.44063E+01	7.1294E+00	7.3091E+03	3.5450E+00	0.000E+00	2.263E+00
5.856525E-01	2.45228E+01	6.6402E+00	6.3681E+03	3.7192E+00	0.000E+00	2.117E+00
6.260625E-01	2.45907E+01	6.1736E+00	5.5385E+03	3.8885E+00	0.000E+00	1.980E+00
6.692609E-01	2.46075E+01	5.7303E+00	4.8090E+03	4.0514E+00	0.000E+00	1.853E+00
7.154399E-01	2.45717E+01	5.3113E+00	4.1697E+03	4.2067E+00	0.000E+00	1.733E+00
7.648052E-01	2.44792E+01	4.9173E+00	3.6111E+03	4.3532E+00	0.000E+00	1.621E+00
8.175768E-01	2.43180E+01	4.5204E+00	3.1054E+03	4.4898E+00	0.000E+00	1.516E+00
8.739896E-01	2.40651E+01	4.1474E+00	2.6652E+03	4.6154E+00	0.000E+00	1.419E+00
9.342948E-01	2.37035E+01	3.8042E+00	2.2869E+03	4.7289E+00	0.000E+00	1.327E+00
9.987612E-01	2.32109E+01	3.4901E+00	1.9627E+03	4.8295E+00	0.000E+00	1.241E+00
1.067676E+00	2.23776E+01	3.1296E+00	1.6463E+03	4.9164E+00	0.000E+00	1.161E+00
1.141345E+00	2.10087E+01	2.8099E+00	1.3827E+03	4.9890E+00	0.000E+00	1.086E+00
1.220098E+00	1.83387E+01	2.5271E+00	1.1633E+03	5.0469E+00	0.000E+00	1.016E+00
1.296638E+00	9.85805E+00	2.2975E+00	9.9518E+02	5.0864E+00	0.000E+00	9.562E-01
1.304285E+00	7.26320E+00	2.2766E+00	9.8034E+02	5.0895E+00	0.000E+00	9.506E-01
1.316484E+00	-1.71763E+00	2.2439E+00	9.5733E+02	5.0942E+00	0.000E+00	9.418E-01
1.321777E+00	-1.80834E+01	2.2300E+00	9.4760E+02	5.0962E+00	0.000E+00	9.380E-01
1.329715E+00	4.65608E+00	3.4333E+01	1.4502E+04	5.0990E+00	0.000E+00	9.324E-01
1.331428E+00	7.58197E+00	3.3105E+01	1.3965E+04	5.0996E+00	0.000E+00	9.312E-01
1.349562E+00	1.70997E+01	2.2707E+01	9.4500E+03	5.1054E+00	0.000E+00	9.187E-01
1.351807E+00	1.65453E+01	2.1696E+01	9.0145E+03	5.1061E+00	0.000E+00	9.172E-01
1.357241E+00	9.87862E+00	1.9456E+01	8.0511E+03	5.1076E+00	0.000E+00	9.135E-01
1.365393E+00	2.22766E+01	3.2299E+01	1.3286E+04	5.1099E+00	0.000E+00	9.080E-01
1.385772E+00	3.03100E+01	2.1413E+01	8.6786E+03	5.1149E+00	0.000E+00	8.947E-01
1.394281E+00	3.05983E+01	1.8697E+01	7.5316E+03	5.1168E+00	0.000E+00	8.892E-01
1.490486E+00	2.62140E+01	9.6673E+00	3.6429E+03	5.1286E+00	0.000E+00	8.318E-01
1.495970E+00	2.59632E+01	9.5770E+00	3.5957E+03	5.1288E+00	0.000E+00	8.288E-01
1.518867E+00	2.46421E+01	9.3979E+00	3.4752E+03	5.1292E+00	0.000E+00	8.163E-01
1.524973E+00	2.35788E+01	9.3768E+00	3.4535E+03	5.1291E+00	0.000E+00	8.130E-01
1.534132E+00	2.43982E+01	1.1247E+01	4.1178E+03	5.1290E+00	0.000E+00	8.082E-01
1.557030E+00	2.49945E+01	1.1241E+01	4.0549E+03	5.1280E+00	0.000E+00	7.963E-01
1.593329E+00	2.52529E+01	1.1364E+01	4.0057E+03	5.1251E+00	0.000E+00	7.781E-01
1.703269E+00	2.62687E+01	1.2220E+01	4.0297E+03	5.1064E+00	0.000E+00	7.279E-01
1.820795E+00	2.82701E+01	1.2334E+01	3.8045E+03	5.0729E+00	0.000E+00	6.809E-01
1.946430E+00	3.00421E+01	1.1629E+01	3.3557E+03	5.0251E+00	0.000E+00	6.370E-01
2.080733E+00	3.13898E+01	1.0502E+01	2.8349E+03	4.9635E+00	0.000E+00	5.959E-01
2.224304E+00	3.22353E+01	9.2507E+00	2.3359E+03	4.8890E+00	0.000E+00	5.574E-01
2.377781E+00	3.26833E+01	8.0996E+00	1.9132E+03	4.8021E+00	0.000E+00	5.214E-01

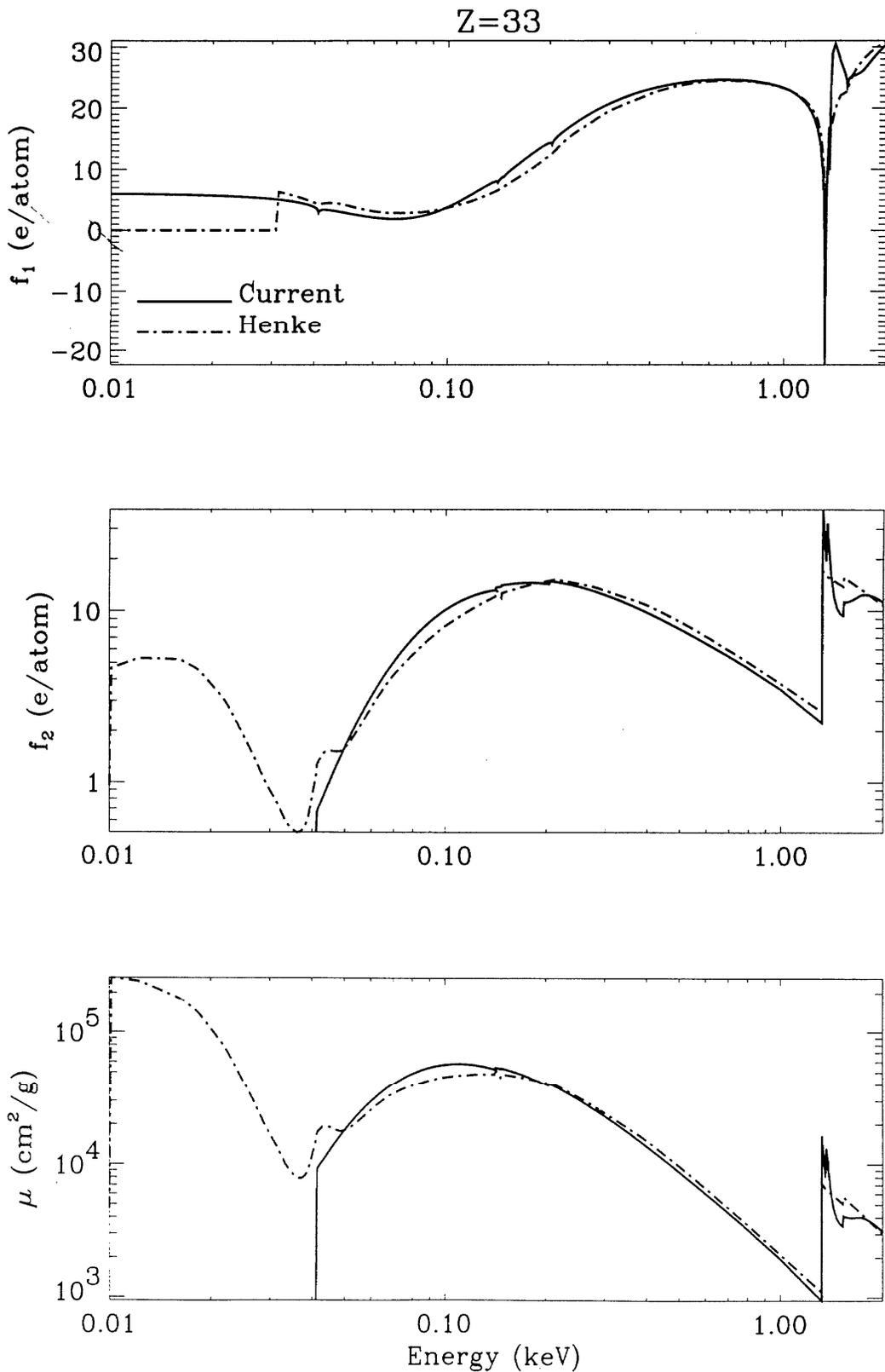
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 265

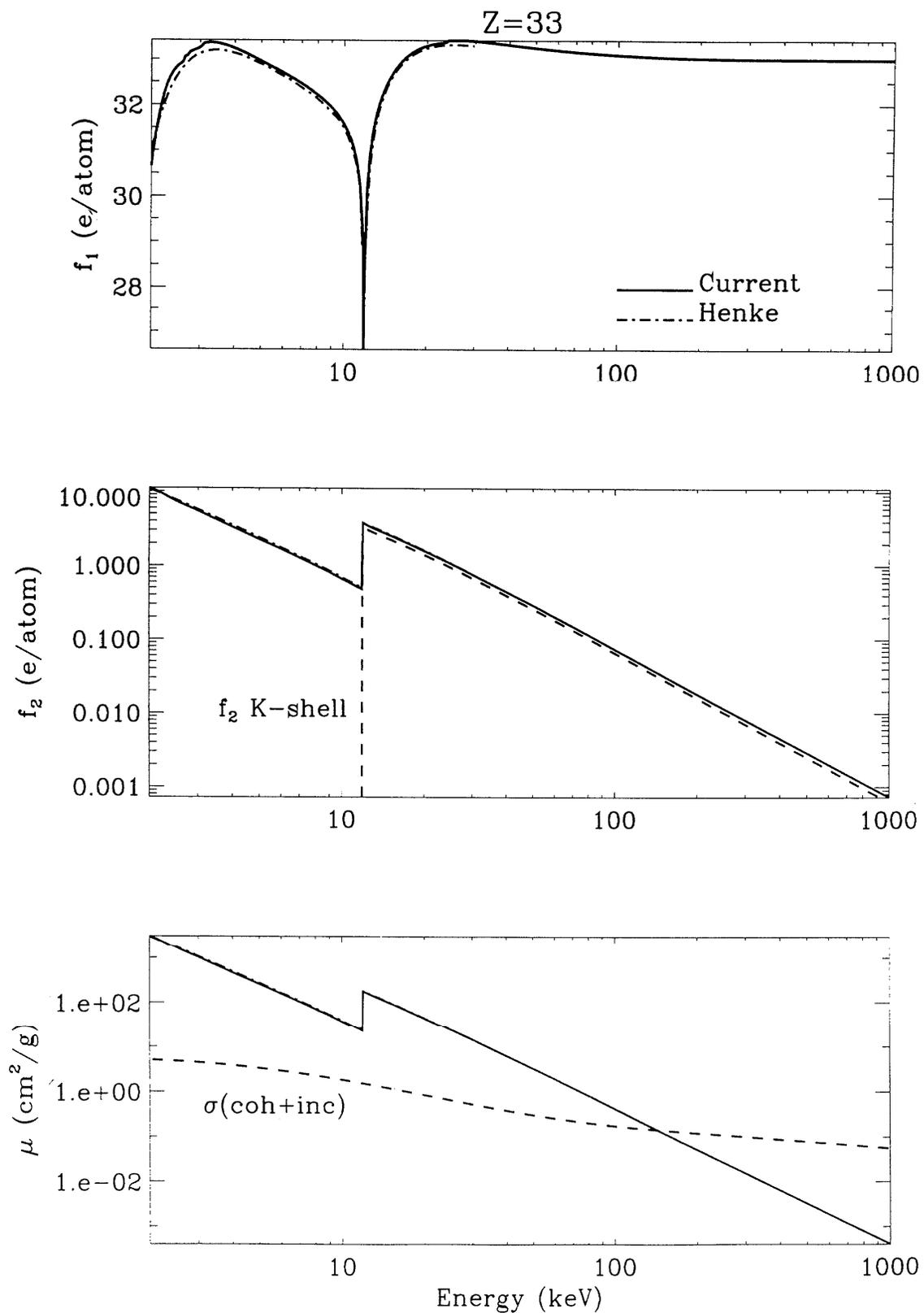
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
2.541848E+00	3.28889E+01	7.1412E+00	1.5779E+03	4.7039E+00	0.000E+00	4.878E-01
2.717235E+00	3.31354E+01	6.3802E+00	1.3188E+03	4.5953E+00	0.000E+00	4.563E-01
2.904724E+00	3.32133E+01	5.7412E+00	1.1101E+03	4.4773E+00	0.000E+00	4.268E-01
3.105150E+00	3.33467E+01	5.1387E+00	9.2949E+02	4.3509E+00	0.000E+00	3.993E-01
3.319406E+00	3.33639E+01	4.5707E+00	7.7338E+02	4.2171E+00	0.000E+00	3.735E-01
3.548445E+00	3.33387E+01	4.0691E+00	6.4406E+02	4.0771E+00	0.000E+00	3.494E-01
3.793288E+00	3.32882E+01	3.6258E+00	5.3685E+02	3.9319E+00	0.000E+00	3.269E-01
4.055024E+00	3.32210E+01	3.2324E+00	4.4771E+02	3.7826E+00	0.000E+00	3.058E-01
4.334821E+00	3.31425E+01	2.8841E+00	3.7369E+02	3.6302E+00	0.000E+00	2.860E-01
4.633924E+00	3.30567E+01	2.5757E+00	3.1219E+02	3.4758E+00	0.000E+00	2.676E-01
4.953664E+00	3.29666E+01	2.3025E+00	2.6106E+02	3.3202E+00	0.000E+00	2.503E-01
5.295467E+00	3.28743E+01	2.0601E+00	2.1850E+02	3.1645E+00	0.000E+00	2.341E-01
5.660855E+00	3.27815E+01	1.8450E+00	1.8306E+02	3.0094E+00	0.000E+00	2.190E-01
6.051453E+00	3.26874E+01	1.6463E+00	1.5280E+02	2.8557E+00	0.000E+00	2.049E-01
6.469004E+00	3.25870E+01	1.4676E+00	1.2742E+02	2.7042E+00	0.000E+00	1.917E-01
6.915365E+00	3.24812E+01	1.3052E+00	1.0601E+02	2.5555E+00	0.000E+00	1.793E-01
7.392525E+00	3.23657E+01	1.1599E+00	8.8123E+01	2.4103E+00	0.000E+00	1.677E-01
7.902609E+00	3.22394E+01	1.0317E+00	7.3327E+01	2.2689E+00	0.000E+00	1.569E-01
8.447890E+00	3.20983E+01	9.1860E-01	6.1073E+01	2.1319E+00	0.000E+00	1.468E-01
9.030794E+00	3.19351E+01	8.1573E-01	5.0733E+01	1.9997E+00	0.000E+00	1.373E-01
9.653919E+00	3.17210E+01	7.1576E-01	4.1642E+01	1.8725E+00	0.000E+00	1.284E-01
1.032004E+01	3.14141E+01	6.2865E-01	3.4214E+01	1.7505E+00	0.000E+00	1.201E-01
1.103212E+01	3.08756E+01	5.5267E-01	2.8137E+01	1.6340E+00	0.000E+00	1.124E-01
1.162937E+01	2.96992E+01	4.9952E-01	2.4125E+01	1.5460E+00	0.000E+00	1.066E-01
1.179334E+01	2.85199E+01	4.8634E-01	2.3162E+01	1.5231E+00	0.000E+00	1.051E-01
1.180737E+01	2.83012E+01	4.8523E-01	2.3082E+01	1.5212E+00	0.000E+00	1.050E-01
1.185483E+01	2.66121E+01	4.8153E-01	2.2814E+01	1.5147E+00	0.000E+00	1.046E-01
1.192603E+01	2.83415E+01	3.8077E+00	1.7933E+02	1.5051E+00	1.569E+02	1.040E-01
1.210403E+01	2.99049E+01	3.6910E+00	1.7127E+02	1.4815E+00	1.498E+02	1.024E-01
1.260708E+01	3.11969E+01	3.4005E+00	1.5150E+02	1.4179E+00	1.324E+02	9.834E-02
1.347697E+01	3.20334E+01	3.0358E+00	1.2652E+02	1.3183E+00	1.108E+02	9.200E-02
1.440688E+01	3.24817E+01	2.7327E+00	1.0654E+02	1.2244E+00	9.354E+01	8.606E-02
1.540095E+01	3.27814E+01	2.4677E+00	8.9994E+01	1.1360E+00	7.926E+01	8.050E-02
1.646362E+01	3.29930E+01	2.2092E+00	7.5367E+01	1.0531E+00	6.649E+01	7.531E-02
1.759961E+01	3.31366E+01	1.9737E+00	6.2988E+01	9.7557E-01	5.564E+01	7.045E-02
1.881398E+01	3.32347E+01	1.7605E+00	5.2558E+01	9.0322E-01	4.647E+01	6.590E-02
2.011215E+01	3.33002E+01	1.5688E+00	4.3810E+01	8.3589E-01	3.876E+01	6.165E-02
2.149988E+01	3.33421E+01	1.3973E+00	3.6504E+01	7.7337E-01	3.232E+01	5.767E-02
2.298338E+01	3.33674E+01	1.2448E+00	3.0420E+01	7.1546E-01	2.694E+01	5.395E-02
2.456923E+01	3.34162E+01	1.1074E+00	2.5315E+01	6.6194E-01	2.242E+01	5.046E-02
2.626450E+01	3.34187E+01	9.8363E-01	2.1035E+01	6.1259E-01	1.863E+01	4.721E-02
2.807676E+01	3.34175E+01	8.6938E-01	1.7391E+01	5.6717E-01	1.541E+01	4.416E-02
3.001405E+01	3.34061E+01	7.6708E-01	1.4354E+01	5.2545E-01	1.273E+01	4.131E-02
3.208502E+01	3.33899E+01	6.7685E-01	1.1849E+01	4.8721E-01	1.051E+01	3.864E-02
3.429889E+01	3.33710E+01	5.9696E-01	9.7755E+00	4.5220E-01	8.679E+00	3.615E-02
3.666551E+01	3.33504E+01	5.2646E-01	8.0645E+00	4.2021E-01	7.168E+00	3.381E-02
3.919543E+01	3.33290E+01	4.6432E-01	6.6535E+00	3.9103E-01	5.920E+00	3.163E-02
4.189992E+01	3.33075E+01	4.0953E-01	5.4897E+00	3.6443E-01	4.889E+00	2.959E-02
4.479101E+01	3.32864E+01	3.6124E-01	4.5297E+00	3.4022E-01	4.037E+00	2.768E-02
4.788159E+01	3.32661E+01	3.1866E-01	3.7379E+00	3.1820E-01	3.334E+00	2.589E-02
5.118542E+01	3.32468E+01	2.8111E-01	3.0846E+00	2.9820E-01	2.754E+00	2.422E-02
5.471721E+01	3.32282E+01	2.4662E-01	2.5315E+00	2.8003E-01	2.260E+00	2.266E-02
5.849270E+01	3.32101E+01	2.1628E-01	2.0767E+00	2.6353E-01	1.854E+00	2.120E-02
6.252870E+01	3.31928E+01	1.8968E-01	1.7038E+00	2.4855E-01	1.521E+00	1.983E-02
6.684318E+01	3.31765E+01	1.6636E-01	1.3978E+00	2.3495E-01	1.248E+00	1.855E-02
7.145536E+01	3.31613E+01	1.4591E-01	1.1469E+00	2.2259E-01	1.023E+00	1.735E-02
7.638578E+01	3.31471E+01	1.2798E-01	9.4102E-01	2.1134E-01	8.396E-01	1.623E-02
8.165640E+01	3.31340E+01	1.1213E-01	7.7126E-01	2.0111E-01	6.879E-01	1.518E-02
8.729069E+01	3.31218E+01	9.7993E-02	6.3052E-01	1.9177E-01	5.619E-01	1.420E-02
9.331374E+01	3.31105E+01	8.5642E-02	5.1548E-01	1.8323E-01	4.590E-01	1.329E-02
9.975239E+01	3.31000E+01	7.4852E-02	4.2145E-01	1.7542E-01	3.750E-01	1.243E-02
1.066353E+02	3.30904E+01	6.5423E-02	3.4459E-01	1.6824E-01	3.063E-01	1.163E-02
1.139931E+02	3.30816E+01	5.7184E-02	2.8175E-01	1.6162E-01	2.503E-01	1.088E-02
1.218587E+02	3.30736E+01	4.9985E-02	2.3039E-01	1.5551E-01	2.044E-01	1.017E-02
1.302669E+02	3.30663E+01	4.3694E-02	1.8839E-01	1.4984E-01	1.670E-01	9.518E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.392553E+02	3.30597E+01	3.8196E-02	1.5405E-01	1.4456E-01	1.364E-01	8.903E-03
1.488640E+02	3.30537E+01	3.3391E-02	1.2598E-01	1.3962E-01	1.115E-01	8.329E-03
1.591356E+02	3.30482E+01	2.9191E-02	1.0303E-01	1.3498E-01	9.105E-02	7.791E-03
1.701159E+02	3.30433E+01	2.5521E-02	8.4260E-02	1.3061E-01	7.438E-02	7.288E-03
1.818539E+02	3.30388E+01	2.2313E-02	6.8913E-02	1.2647E-01	6.076E-02	6.818E-03
1.944018E+02	3.30348E+01	1.9508E-02	5.6363E-02	1.2253E-01	4.964E-02	6.378E-03
2.078156E+02	3.30312E+01	1.7057E-02	4.6100E-02	1.1877E-01	4.055E-02	5.966E-03
2.221548E+02	3.30279E+01	1.4915E-02	3.7707E-02	1.1517E-01	3.312E-02	5.581E-03
2.374835E+02	3.30250E+01	1.3041E-02	3.0844E-02	1.1171E-01	2.706E-02	5.221E-03
2.538699E+02	3.30223E+01	1.1404E-02	2.5230E-02	1.0838E-01	2.211E-02	4.884E-03
2.713869E+02	3.30200E+01	9.9724E-03	2.0639E-02	1.0515E-01	1.806E-02	4.569E-03
2.901126E+02	3.30178E+01	8.7208E-03	1.6883E-02	1.0202E-01	1.475E-02	4.274E-03
3.101304E+02	3.30159E+01	7.6265E-03	1.3812E-02	9.8974E-02	1.205E-02	3.998E-03
3.315294E+02	3.30142E+01	6.6698E-03	1.1300E-02	9.6009E-02	9.845E-03	3.740E-03
3.544049E+02	3.30127E+01	5.8332E-03	9.2445E-03	9.3118E-02	8.042E-03	3.498E-03
3.788588E+02	3.30113E+01	5.1018E-03	7.5634E-03	9.0293E-02	6.570E-03	3.273E-03
4.050001E+02	3.30101E+01	4.4622E-03	6.1882E-03	8.7530E-02	5.367E-03	3.061E-03
4.329451E+02	3.30090E+01	3.9029E-03	5.0632E-03	8.4826E-02	4.384E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 269

Se Z = 34

Atomic weight = 7.896000E+01 g/mol, nominal density ρ (g/cm³) = 4.7800E+00

μ_a (barns/atom) = $\mu(\text{cm}^2/\text{g}) \times 1.31116\text{E}+02$, E (eV) $\mu(\text{cm}^2/\text{g}) = f_2(\text{e}/\text{atom}) \times 5.32932\text{E}+05$

9 edges. Edge energies (keV):

K		1.26578E+00	L	I	1.65390E+00	L	II	1.47620E+00	L	III	1.43580E+00
M	I	2.31500E-00	M	II	1.68200E-00	M	III	1.61900E-00	M	IV	5.67000E-02
M	V	5.67000E-02									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.0514E-01, -1.2900E-01 e/atom

Nuclear Thomson correction $f_{\text{NT}} = -8.0314\text{E}-03$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	7.12170E+00	0.0000E+00	0.0000E+00	1.4390E-04	0.000E+00	1.160E+02
1.142761E-02	7.11201E+00	0.0000E+00	0.0000E+00	1.9625E-04	0.000E+00	1.085E+02
1.221612E-02	7.10091E+00	0.0000E+00	0.0000E+00	2.6619E-04	0.000E+00	1.015E+02
1.305903E-02	7.08817E+00	0.0000E+00	0.0000E+00	3.5912E-04	0.000E+00	9.494E+01
1.396010E-02	7.07355E+00	0.0000E+00	0.0000E+00	4.8192E-04	0.000E+00	8.881E+01
1.492335E-02	7.05677E+00	0.0000E+00	0.0000E+00	6.4327E-04	0.000E+00	8.308E+01
1.595306E-02	7.03750E+00	0.0000E+00	0.0000E+00	8.5413E-04	0.000E+00	7.772E+01
1.705382E-02	7.01534E+00	0.0000E+00	0.0000E+00	1.1282E-03	0.000E+00	7.270E+01
1.823053E-02	6.98983E+00	0.0000E+00	0.0000E+00	1.4824E-03	0.000E+00	6.801E+01
1.948844E-02	6.96044E+00	0.0000E+00	0.0000E+00	1.9378E-03	0.000E+00	6.362E+01
2.083314E-02	6.92655E+00	0.0000E+00	0.0000E+00	2.5200E-03	0.000E+00	5.951E+01
2.227063E-02	6.88738E+00	0.0000E+00	0.0000E+00	3.2605E-03	0.000E+00	5.567E+01
2.380730E-02	6.84205E+00	0.0000E+00	0.0000E+00	4.1972E-03	0.000E+00	5.208E+01
2.545001E-02	6.78948E+00	0.0000E+00	0.0000E+00	5.3758E-03	0.000E+00	4.872E+01
2.720606E-02	6.72835E+00	0.0000E+00	0.0000E+00	6.8508E-03	0.000E+00	4.557E+01
2.908327E-02	6.65705E+00	0.0000E+00	0.0000E+00	8.6873E-03	0.000E+00	4.263E+01
3.109002E-02	6.57359E+00	0.0000E+00	0.0000E+00	1.0962E-02	0.000E+00	3.988E+01
3.323523E-02	6.47542E+00	0.0000E+00	0.0000E+00	1.3764E-02	0.000E+00	3.731E+01
3.552846E-02	6.35930E+00	0.0000E+00	0.0000E+00	1.7198E-02	0.000E+00	3.490E+01
3.797993E-02	6.22090E+00	0.0000E+00	0.0000E+00	2.1385E-02	0.000E+00	3.264E+01
4.060054E-02	6.05430E+00	0.0000E+00	0.0000E+00	2.6463E-02	0.000E+00	3.054E+01
4.340198E-02	5.85093E+00	0.0000E+00	0.0000E+00	3.2591E-02	0.000E+00	2.857E+01
4.639671E-02	5.59743E+00	0.0000E+00	0.0000E+00	3.9948E-02	0.000E+00	2.672E+01
4.959809E-02	5.26996E+00	0.0000E+00	0.0000E+00	4.8736E-02	0.000E+00	2.500E+01
5.302035E-02	4.81237E+00	0.0000E+00	0.0000E+00	5.9178E-02	0.000E+00	2.338E+01
5.556600E-02	4.28445E+00	0.0000E+00	0.0000E+00	6.7641E-02	0.000E+00	2.231E+01
5.641650E-02	3.91211E+00	0.0000E+00	0.0000E+00	7.0600E-02	0.000E+00	2.198E+01
5.667876E-02	3.42611E+00	0.0000E+00	0.0000E+00	7.1525E-02	0.000E+00	2.187E+01
5.698350E-02	3.79296E+00	5.4255E-01	5.0741E+03	7.2608E-02	0.000E+00	2.176E+01
5.783400E-02	3.87146E+00	6.0226E-01	5.5497E+03	7.5674E-02	0.000E+00	2.144E+01
6.058959E-02	3.62586E+00	8.3607E-01	7.3539E+03	8.6049E-02	0.000E+00	2.046E+01
6.477028E-02	3.11653E+00	1.3253E+00	1.0905E+04	1.0305E-01	0.000E+00	1.914E+01
6.923942E-02	2.60474E+00	1.9914E+00	1.5328E+04	1.2285E-01	0.000E+00	1.791E+01
7.401695E-02	2.15098E+00	2.8356E+00	2.0417E+04	1.4579E-01	0.000E+00	1.675E+01
7.912411E-02	1.81009E+00	3.8477E+00	2.5916E+04	1.7224E-01	0.000E+00	1.567E+01
8.458368E-02	1.63040E+00	5.0006E+00	3.1507E+04	2.0259E-01	0.000E+00	1.466E+01
9.041995E-02	1.64914E+00	6.2528E+00	3.6854E+04	2.3723E-01	0.000E+00	1.371E+01
9.665893E-02	1.88864E+00	7.5533E+00	4.1645E+04	2.7659E-01	0.000E+00	1.283E+01
1.033284E-01	2.35448E+00	8.8472E+00	4.5631E+04	3.2107E-01	0.000E+00	1.200E+01
1.104581E-01	3.03577E+00	1.0081E+01	4.8640E+04	3.7109E-01	0.000E+00	1.122E+01
1.180797E-01	3.90686E+00	1.1208E+01	5.0587E+04	4.2708E-01	0.000E+00	1.050E+01
1.262272E-01	4.92969E+00	1.2190E+01	5.1468E+04	4.8943E-01	0.000E+00	9.822E+00
1.349368E-01	6.05516E+00	1.3000E+01	5.1345E+04	5.5851E-01	0.000E+00	9.188E+00
1.442475E-01	7.21906E+00	1.3623E+01	5.0331E+04	6.3469E-01	0.000E+00	8.595E+00
1.542005E-01	8.30675E+00	1.4052E+01	4.8565E+04	7.1827E-01	0.000E+00	8.040E+00
1.586620E-01	8.64723E+00	1.4177E+01	4.7619E+04	7.5632E-01	0.000E+00	7.814E+00
1.610905E-01	8.63184E+00	1.4229E+01	4.7075E+04	7.7716E-01	0.000E+00	7.697E+00
1.617381E-01	8.38352E+00	1.4242E+01	4.6927E+04	7.8273E-01	0.000E+00	7.666E+00
1.627095E-01	8.77941E+00	1.4871E+01	4.8708E+04	7.9110E-01	0.000E+00	7.620E+00
1.648404E-01	9.21656E+00	1.4928E+01	4.8261E+04	8.0950E-01	0.000E+00	7.521E+00
1.651380E-01	9.25960E+00	1.4935E+01	4.8198E+04	8.1208E-01	0.000E+00	7.508E+00
1.673590E-01	9.49061E+00	1.4986E+01	4.7721E+04	8.3133E-01	0.000E+00	7.408E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.680318E-01	9.44902E+00	1.5000E+01	4.7575E+04	8.3717E-01	0.000E+00	7.379E+00
1.690410E-01	9.71715E+00	1.5287E+01	4.8195E+04	8.4595E-01	0.000E+00	7.335E+00
1.715640E-01	1.01672E+01	1.5345E+01	4.7666E+04	8.6793E-01	0.000E+00	7.227E+00
1.762144E-01	1.08049E+01	1.5433E+01	4.6675E+04	9.0861E-01	0.000E+00	7.036E+00
1.883732E-01	1.22345E+01	1.5564E+01	4.4032E+04	1.0157E+00	0.000E+00	6.582E+00
2.013709E-01	1.35635E+01	1.5559E+01	4.1176E+04	1.1309E+00	0.000E+00	6.157E+00
2.152655E-01	1.47764E+01	1.5427E+01	3.8192E+04	1.2541E+00	0.000E+00	5.760E+00
2.268700E-01	1.55251E+01	1.5243E+01	3.5806E+04	1.3567E+00	0.000E+00	5.465E+00
2.301188E-01	1.55403E+01	1.5181E+01	3.5158E+04	1.3853E+00	0.000E+00	5.388E+00
2.303425E-01	1.55218E+01	1.5177E+01	3.5113E+04	1.3873E+00	0.000E+00	5.383E+00
2.312685E-01	1.52643E+01	1.5158E+01	3.4930E+04	1.3954E+00	0.000E+00	5.361E+00
2.326575E-01	1.57024E+01	1.5777E+01	3.6139E+04	1.4076E+00	0.000E+00	5.329E+00
2.361300E-01	1.62554E+01	1.5710E+01	3.5456E+04	1.4381E+00	0.000E+00	5.251E+00
2.459970E-01	1.72195E+01	1.5497E+01	3.3572E+04	1.5242E+00	0.000E+00	5.040E+00
2.629708E-01	1.85115E+01	1.5073E+01	3.0547E+04	1.6705E+00	0.000E+00	4.715E+00
2.811158E-01	1.96545E+01	1.4566E+01	2.7614E+04	1.8238E+00	0.000E+00	4.410E+00
3.005128E-01	2.06785E+01	1.3993E+01	2.4815E+04	1.9836E+00	0.000E+00	4.126E+00
3.212482E-01	2.15921E+01	1.3372E+01	2.2184E+04	2.1492E+00	0.000E+00	3.859E+00
3.434143E-01	2.24007E+01	1.2719E+01	1.9738E+04	2.3200E+00	0.000E+00	3.610E+00
3.671099E-01	2.31097E+01	1.2047E+01	1.7488E+04	2.4949E+00	0.000E+00	3.377E+00
3.924405E-01	2.37249E+01	1.1368E+01	1.5437E+04	2.6732E+00	0.000E+00	3.159E+00
4.195189E-01	2.42525E+01	1.0691E+01	1.3581E+04	2.8538E+00	0.000E+00	2.955E+00
4.484657E-01	2.46988E+01	1.0025E+01	1.1913E+04	3.0356E+00	0.000E+00	2.765E+00
4.794098E-01	2.50701E+01	9.3760E+00	1.0423E+04	3.2174E+00	0.000E+00	2.586E+00
5.124891E-01	2.53770E+01	8.7484E+00	9.0973E+03	3.3979E+00	0.000E+00	2.419E+00
5.478508E-01	2.56153E+01	8.1457E+00	7.9239E+03	3.5760E+00	0.000E+00	2.263E+00
5.856525E-01	2.57945E+01	7.5704E+00	6.8889E+03	3.7503E+00	0.000E+00	2.117E+00
6.260625E-01	2.59182E+01	7.0238E+00	5.9790E+03	3.9195E+00	0.000E+00	1.980E+00
6.692609E-01	2.59889E+01	6.5064E+00	5.1811E+03	4.0824E+00	0.000E+00	1.853E+00
7.154399E-01	2.60077E+01	6.0170E+00	4.4821E+03	4.2376E+00	0.000E+00	1.733E+00
7.648052E-01	2.59709E+01	5.5560E+00	3.8715E+03	4.3841E+00	0.000E+00	1.621E+00
8.175768E-01	2.58757E+01	5.1241E+00	3.3401E+03	4.5205E+00	0.000E+00	1.516E+00
8.739896E-01	2.57157E+01	4.7216E+00	2.8791E+03	4.6459E+00	0.000E+00	1.419E+00
9.342948E-01	2.54804E+01	4.3482E+00	2.4802E+03	4.7592E+00	0.000E+00	1.327E+00
9.987612E-01	2.51522E+01	4.0032E+00	2.1361E+03	4.8597E+00	0.000E+00	1.241E+00
1.067676E+00	2.46682E+01	3.6090E+00	1.8014E+03	4.9465E+00	0.000E+00	1.161E+00
1.141345E+00	2.39217E+01	3.2326E+00	1.5094E+03	5.0190E+00	0.000E+00	1.086E+00
1.220098E+00	2.27353E+01	2.9006E+00	1.2670E+03	5.0767E+00	0.000E+00	1.016E+00
1.304285E+00	2.05621E+01	2.6071E+00	1.0653E+03	5.1193E+00	0.000E+00	9.506E-01
1.394281E+00	1.40810E+01	2.3473E+00	8.9722E+02	5.1465E+00	0.000E+00	8.892E-01
1.407084E+00	1.15732E+01	2.3141E+00	8.7647E+02	5.1491E+00	0.000E+00	8.811E-01
1.428621E+00	4.20243E-01	2.2601E+00	8.4311E+02	5.1526E+00	0.000E+00	8.679E-01
1.434364E+00	-1.53423E+01	2.2461E+00	8.3453E+02	5.1534E+00	0.000E+00	8.644E-01
1.442979E+00	6.54411E+00	3.3205E+01	1.2264E+04	5.1545E+00	0.000E+00	8.592E-01
1.446676E+00	1.15688E+01	3.0926E+01	1.1392E+04	5.1550E+00	0.000E+00	8.570E-01
1.464516E+00	1.90639E+01	2.2112E+01	8.0465E+03	5.1567E+00	0.000E+00	8.466E-01
1.468819E+00	1.82728E+01	2.0436E+01	7.4147E+03	5.1571E+00	0.000E+00	8.441E-01
1.474724E+00	1.17113E+01	1.8367E+01	6.6374E+03	5.1575E+00	0.000E+00	8.407E-01
1.483581E+00	2.34908E+01	3.0863E+01	1.1087E+04	5.1580E+00	0.000E+00	8.357E-01
1.490486E+00	2.78052E+01	2.7157E+01	9.7102E+03	5.1584E+00	0.000E+00	8.318E-01
1.505724E+00	3.10584E+01	2.0612E+01	7.2954E+03	5.1588E+00	0.000E+00	8.234E-01
1.593329E+00	2.82684E+01	1.0106E+01	3.3803E+03	5.1548E+00	0.000E+00	7.781E-01
1.620822E+00	2.72045E+01	9.5470E+00	3.1391E+03	5.1515E+00	0.000E+00	7.649E-01
1.645631E+00	2.58594E+01	9.3216E+00	3.0188E+03	5.1477E+00	0.000E+00	7.534E-01
1.652246E+00	2.47876E+01	9.2965E+00	2.9986E+03	5.1465E+00	0.000E+00	7.504E-01
1.662170E+00	2.56218E+01	1.1180E+01	3.5845E+03	5.1447E+00	0.000E+00	7.459E-01
1.686978E+00	2.62318E+01	1.1155E+01	3.5238E+03	5.1398E+00	0.000E+00	7.349E-01
1.703269E+00	2.63659E+01	1.1177E+01	3.4971E+03	5.1362E+00	0.000E+00	7.279E-01
1.820795E+00	2.71986E+01	1.1858E+01	3.4708E+03	5.1027E+00	0.000E+00	6.809E-01
1.946430E+00	2.91061E+01	1.2212E+01	3.3436E+03	5.0550E+00	0.000E+00	6.370E-01
2.080733E+00	3.08959E+01	1.1550E+01	2.9582E+03	4.9935E+00	0.000E+00	5.959E-01
2.224304E+00	3.22582E+01	1.0469E+01	2.5083E+03	4.9190E+00	0.000E+00	5.574E-01
2.377781E+00	3.31242E+01	9.2499E+00	2.0732E+03	4.8322E+00	0.000E+00	5.214E-01
2.541848E+00	3.35942E+01	8.1240E+00	1.7033E+03	4.7341E+00	0.000E+00	4.878E-01
2.717235E+00	3.38253E+01	7.1866E+00	1.4095E+03	4.6256E+00	0.000E+00	4.563E-01

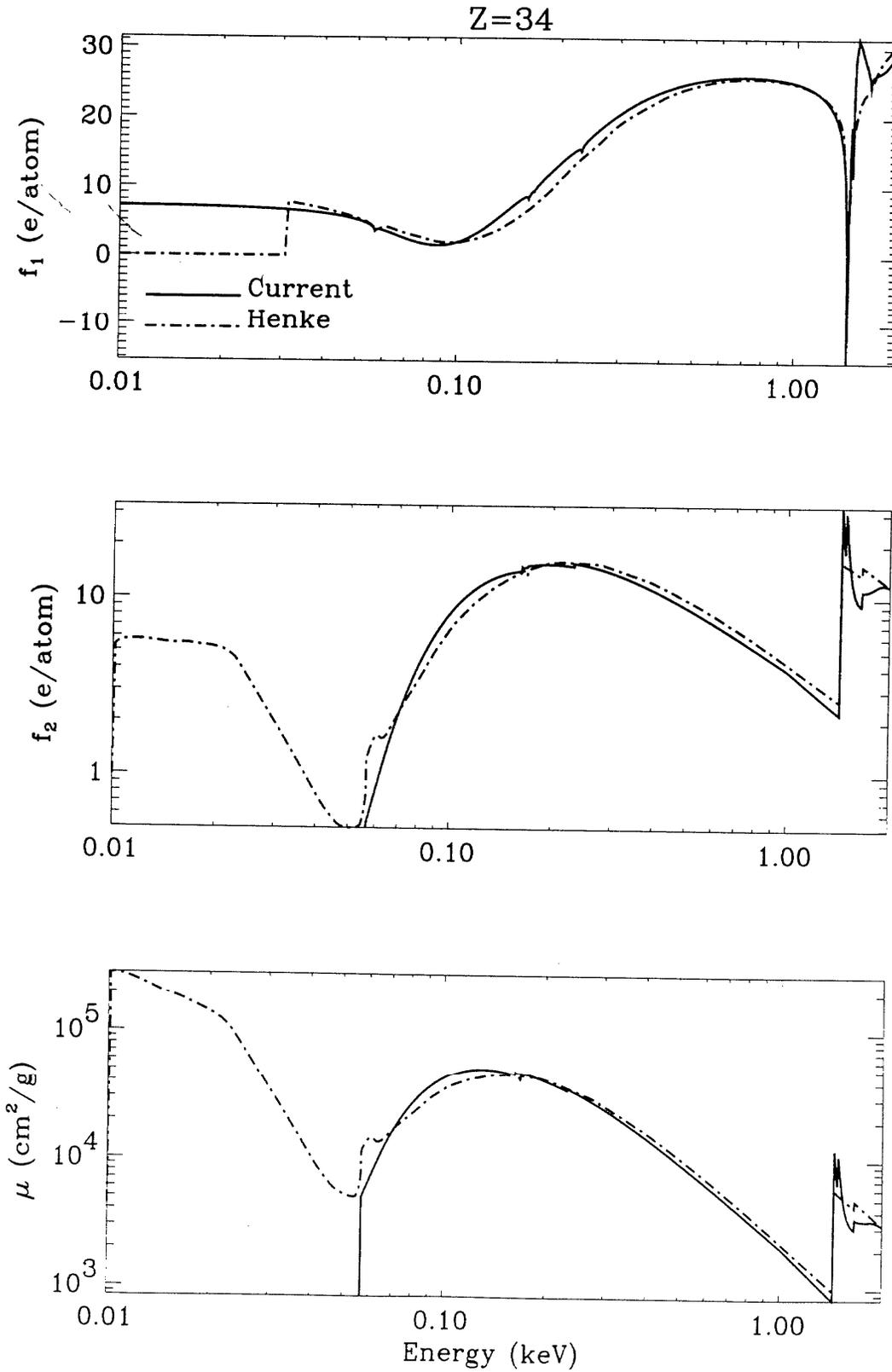
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 271

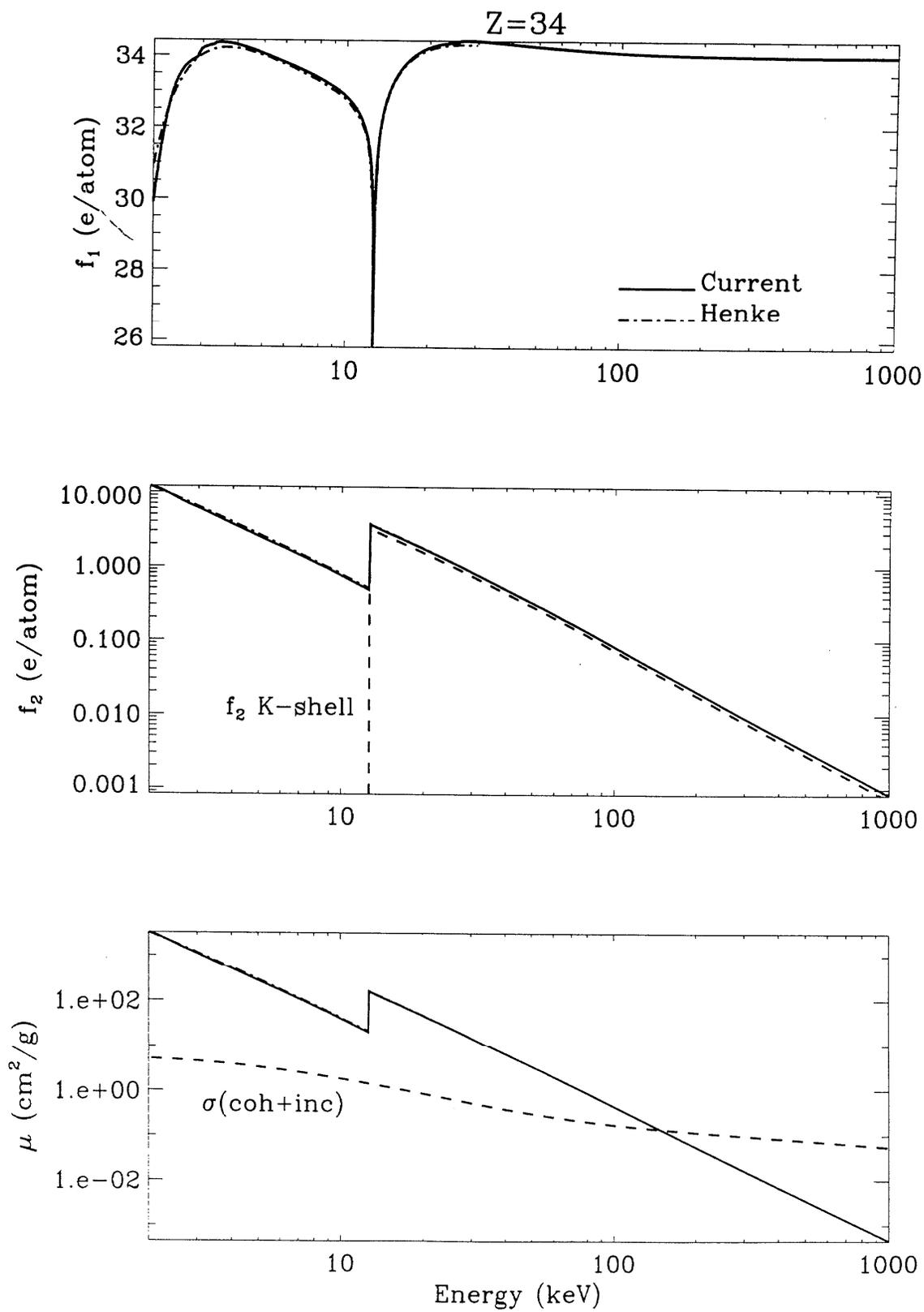
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
2.904724E+00	3.40641E+01	6.4406E+00	1.1817E+03	4.5075E+00	0.000E+00	4.268E-01
3.105150E+00	3.42408E+01	5.7735E+00	9.9089E+02	4.3811E+00	0.000E+00	3.993E-01
3.319406E+00	3.43399E+01	5.1473E+00	8.2640E+02	4.2473E+00	0.000E+00	3.735E-01
3.548445E+00	3.43524E+01	4.5799E+00	6.8784E+02	4.1072E+00	0.000E+00	3.494E-01
3.793288E+00	3.43281E+01	4.0785E+00	5.7301E+02	3.9619E+00	0.000E+00	3.269E-01
4.055024E+00	3.42797E+01	3.6353E+00	4.7776E+02	3.8124E+00	0.000E+00	3.058E-01
4.334821E+00	3.42148E+01	3.2430E+00	3.9871E+02	3.6598E+00	0.000E+00	2.860E-01
4.633924E+00	3.41389E+01	2.8944E+00	3.3288E+02	3.5050E+00	0.000E+00	2.676E-01
4.953664E+00	3.40552E+01	2.5855E+00	2.7816E+02	3.3491E+00	0.000E+00	2.503E-01
5.295467E+00	3.39669E+01	2.3116E+00	2.3264E+02	3.1929E+00	0.000E+00	2.341E-01
5.660855E+00	3.38759E+01	2.0686E+00	1.9475E+02	3.0373E+00	0.000E+00	2.190E-01
6.051453E+00	3.37839E+01	1.8529E+00	1.6318E+02	2.8831E+00	0.000E+00	2.049E-01
6.469004E+00	3.36913E+01	1.6562E+00	1.3644E+02	2.7310E+00	0.000E+00	1.917E-01
6.915365E+00	3.35926E+01	1.4764E+00	1.1378E+02	2.5817E+00	0.000E+00	1.793E-01
7.392525E+00	3.34882E+01	1.3147E+00	9.4780E+01	2.4357E+00	0.000E+00	1.677E-01
7.902609E+00	3.33744E+01	1.1689E+00	7.8825E+01	2.2936E+00	0.000E+00	1.569E-01
8.447890E+00	3.32495E+01	1.0402E+00	6.5619E+01	2.1558E+00	0.000E+00	1.468E-01
9.030794E+00	3.31131E+01	9.2336E-01	5.4490E+01	2.0227E+00	0.000E+00	1.373E-01
9.653919E+00	3.29468E+01	8.1040E-01	4.4737E+01	1.8946E+00	0.000E+00	1.284E-01
1.032004E+01	3.27281E+01	7.1195E-01	3.6766E+01	1.7717E+00	0.000E+00	1.201E-01
1.103212E+01	3.24168E+01	6.2607E-01	3.0244E+01	1.6543E+00	0.000E+00	1.124E-01
1.179334E+01	3.18669E+01	5.5107E-01	2.4903E+01	1.5424E+00	0.000E+00	1.051E-01
1.240464E+01	3.07234E+01	5.0063E-01	2.1508E+01	1.4615E+00	0.000E+00	9.995E-02
1.260708E+01	2.91062E+01	4.8552E-01	2.0524E+01	1.4362E+00	0.000E+00	9.834E-02
1.264514E+01	2.76562E+01	4.8276E-01	2.0346E+01	1.4316E+00	0.000E+00	9.805E-02
1.272109E+01	2.93734E+01	3.7868E+00	1.5864E+02	1.4223E+00	1.386E+02	9.746E-02
1.291096E+01	3.09258E+01	3.6719E+00	1.5157E+02	1.3997E+00	1.324E+02	9.603E-02
1.347697E+01	3.22506E+01	3.3722E+00	1.3335E+02	1.3357E+00	1.164E+02	9.200E-02
1.440688E+01	3.30616E+01	3.0123E+00	1.1143E+02	1.2408E+00	9.745E+01	8.606E-02
1.540095E+01	3.35009E+01	2.7116E+00	9.3833E+01	1.1514E+00	8.228E+01	8.050E-02
1.646362E+01	3.37958E+01	2.4478E+00	7.9237E+01	1.0676E+00	6.968E+01	7.531E-02
1.759961E+01	3.40028E+01	2.1904E+00	6.6327E+01	9.8906E-01	5.841E+01	7.045E-02
1.881398E+01	3.41433E+01	1.9566E+00	5.5422E+01	9.1576E-01	4.886E+01	6.590E-02
2.011215E+01	3.42391E+01	1.7451E+00	4.6243E+01	8.4750E-01	4.080E+01	6.165E-02
2.149988E+01	3.43029E+01	1.5552E+00	3.8550E+01	7.8408E-01	3.403E+01	5.767E-02
2.298338E+01	3.43439E+01	1.3856E+00	3.2128E+01	7.2529E-01	2.837E+01	5.395E-02
2.456923E+01	3.43689E+01	1.2347E+00	2.6782E+01	6.7092E-01	2.366E+01	5.046E-02
2.626450E+01	3.44192E+01	1.0988E+00	2.2295E+01	6.2074E-01	1.970E+01	4.721E-02
2.807676E+01	3.44238E+01	9.7157E-01	1.8442E+01	5.7453E-01	1.630E+01	4.416E-02
3.001405E+01	3.44171E+01	8.5771E-01	1.5230E+01	5.3205E-01	1.347E+01	4.131E-02
3.208502E+01	3.44042E+01	7.5718E-01	1.2577E+01	4.9307E-01	1.113E+01	3.864E-02
3.429889E+01	3.43873E+01	6.6844E-01	1.0386E+01	4.5736E-01	9.195E+00	3.615E-02
3.666551E+01	3.43680E+01	5.8990E-01	8.5742E+00	4.2471E-01	7.598E+00	3.381E-02
3.919543E+01	3.43473E+01	5.2047E-01	7.0768E+00	3.9488E-01	6.278E+00	3.163E-02
4.189992E+01	3.43260E+01	4.5925E-01	5.8412E+00	3.6769E-01	5.187E+00	2.959E-02
4.479101E+01	3.43046E+01	4.0525E-01	4.8217E+00	3.4291E-01	4.286E+00	2.768E-02
4.788159E+01	3.42837E+01	3.5762E-01	3.9804E+00	3.2036E-01	3.542E+00	2.589E-02
5.118542E+01	3.42635E+01	3.1561E-01	3.2861E+00	2.9985E-01	2.926E+00	2.422E-02
5.471721E+01	3.42444E+01	2.7856E-01	2.7131E+00	2.8121E-01	2.418E+00	2.266E-02
5.849270E+01	3.42261E+01	2.4442E-01	2.2269E+00	2.6427E-01	1.985E+00	2.120E-02
6.252870E+01	3.42081E+01	2.1442E-01	1.8275E+00	2.4888E-01	1.629E+00	1.983E-02
6.684318E+01	3.41910E+01	1.8812E-01	1.4998E+00	2.3490E-01	1.337E+00	1.855E-02
7.145536E+01	3.41749E+01	1.6505E-01	1.2310E+00	2.2219E-01	1.097E+00	1.735E-02
7.638578E+01	3.41598E+01	1.4481E-01	1.0103E+00	2.1062E-01	9.001E-01	1.623E-02
8.165640E+01	3.41459E+01	1.2692E-01	8.2837E-01	2.0009E-01	7.377E-01	1.518E-02
8.729069E+01	3.41328E+01	1.1097E-01	6.7749E-01	1.9048E-01	6.030E-01	1.420E-02
9.331374E+01	3.41207E+01	9.7022E-02	5.5411E-01	1.8170E-01	4.929E-01	1.329E-02
9.975239E+01	3.41094E+01	8.4831E-02	4.5322E-01	1.7367E-01	4.029E-01	1.243E-02
1.066353E+02	3.40990E+01	7.4175E-02	3.7071E-01	1.6629E-01	3.294E-01	1.163E-02
1.139931E+02	3.40895E+01	6.4860E-02	3.0323E-01	1.5951E-01	2.692E-01	1.088E-02
1.218587E+02	3.40808E+01	5.6717E-02	2.4804E-01	1.5324E-01	2.201E-01	1.017E-02
1.302669E+02	3.40729E+01	4.9598E-02	2.0291E-01	1.4744E-01	1.799E-01	9.518E-03
1.392553E+02	3.40657E+01	4.3374E-02	1.6599E-01	1.4205E-01	1.471E-01	8.903E-03
1.488640E+02	3.40591E+01	3.7932E-02	1.3580E-01	1.3702E-01	1.202E-01	8.329E-03
1.591356E+02	3.40531E+01	3.3174E-02	1.1110E-01	1.3231E-01	9.826E-02	7.791E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.701159E+02	3.40477E+01	2.9014E-02	9.0892E-02	1.2789E-01	8.032E-02	7.288E-03
1.818539E+02	3.40429E+01	2.5376E-02	7.4365E-02	1.2371E-01	6.565E-02	6.818E-03
1.944018E+02	3.40385E+01	2.2195E-02	6.0845E-02	1.1975E-01	5.367E-02	6.378E-03
2.078156E+02	3.40345E+01	1.9413E-02	4.9784E-02	1.1599E-01	4.387E-02	5.966E-03
2.221548E+02	3.40309E+01	1.6981E-02	4.0735E-02	1.1240E-01	3.586E-02	5.581E-03
2.374835E+02	3.40277E+01	1.4853E-02	3.3332E-02	1.0897E-01	2.931E-02	5.221E-03
2.538699E+02	3.40248E+01	1.2993E-02	2.7275E-02	1.0566E-01	2.396E-02	4.884E-03
2.713869E+02	3.40221E+01	1.1366E-02	2.2320E-02	1.0248E-01	1.959E-02	4.569E-03
2.901126E+02	3.40198E+01	9.9429E-03	1.8265E-02	9.9413E-02	1.601E-02	4.274E-03
3.101304E+02	3.40177E+01	8.6982E-03	1.4947E-02	9.6440E-02	1.309E-02	3.998E-03
3.315294E+02	3.40158E+01	7.6096E-03	1.2232E-02	9.3557E-02	1.070E-02	3.740E-03
3.544049E+02	3.40141E+01	6.6574E-03	1.0011E-02	9.0734E-02	8.745E-03	3.498E-03
3.788588E+02	3.40126E+01	5.8245E-03	8.1932E-03	8.8027E-02	7.148E-03	3.273E-03
4.050001E+02	3.40112E+01	5.0959E-03	6.7056E-03	8.5370E-02	5.843E-03	3.061E-03
4.329451E+02	3.40100E+01	4.4586E-03	5.4883E-03	8.2779E-02	4.776E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 275

Br Z= 35

Atomic weight = 7.990400E+01 g/mol, nominal density ρ (g/cm³) = 3.1100E+00

μ_0 (barns/atom) = $\mu_0(\text{cm}^2/\text{g}) \times 1.32684\text{E}+02$, E (eV) $\mu_0(\text{cm}^2/\text{g}) = f_2(\text{e}/\text{atom}) \times 5.26636\text{E}+05$

f_1 edges. Edge energies (keV):

K		1.34737E+00	L	I	1.78200E+00	L	II	1.59600E+00	L	III	1.54990E+00
M	I	2.56500E-00	M	II	1.89300E-00	M	III	1.81500E-00	M	IV	7.01000E-02
M	V	6.90000E-02									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.2007E-01, -1.3860E-01 e/atom

Nuclear Thomson correction f_{NT} = -8.4102E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\alpha(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	7.92654E+00	0.0000E+00	0.0000E+00	1.5960E-04	0.000E+00	1.160E+02
1.142761E-02	7.91924E+00	0.0000E+00	0.0000E+00	2.1723E-04	0.000E+00	1.085E+02
1.221612E-02	7.91088E+00	0.0000E+00	0.0000E+00	2.9410E-04	0.000E+00	1.015E+02
1.305903E-02	7.90131E+00	0.0000E+00	0.0000E+00	3.9605E-04	0.000E+00	9.494E+01
1.396010E-02	7.89034E+00	0.0000E+00	0.0000E+00	5.3051E-04	0.000E+00	8.881E+01
1.492335E-02	7.87777E+00	0.0000E+00	0.0000E+00	7.0689E-04	0.000E+00	8.308E+01
1.595306E-02	7.86335E+00	0.0000E+00	0.0000E+00	9.3698E-04	0.000E+00	7.772E+01
1.705382E-02	7.84680E+00	0.0000E+00	0.0000E+00	1.2355E-03	0.000E+00	7.270E+01
1.823053E-02	7.82781E+00	0.0000E+00	0.0000E+00	1.6208E-03	0.000E+00	6.801E+01
1.948844E-02	7.80599E+00	0.0000E+00	0.0000E+00	2.1152E-03	0.000E+00	6.362E+01
2.083314E-02	7.78090E+00	0.0000E+00	0.0000E+00	2.7465E-03	0.000E+00	5.951E+01
2.227063E-02	7.75202E+00	0.0000E+00	0.0000E+00	3.5481E-03	0.000E+00	5.567E+01
2.380730E-02	7.71875E+00	0.0000E+00	0.0000E+00	4.5605E-03	0.000E+00	5.208E+01
2.545001E-02	7.68036E+00	0.0000E+00	0.0000E+00	5.8326E-03	0.000E+00	4.872E+01
2.720606E-02	7.63602E+00	0.0000E+00	0.0000E+00	7.4224E-03	0.000E+00	4.557E+01
2.908327E-02	7.58469E+00	0.0000E+00	0.0000E+00	9.3990E-03	0.000E+00	4.263E+01
3.109002E-02	7.52515E+00	0.0000E+00	0.0000E+00	1.1844E-02	0.000E+00	3.988E+01
3.323523E-02	7.45592E+00	0.0000E+00	0.0000E+00	1.4851E-02	0.000E+00	3.731E+01
3.552846E-02	7.37517E+00	0.0000E+00	0.0000E+00	1.8533E-02	0.000E+00	3.490E+01
3.797993E-02	7.28066E+00	0.0000E+00	0.0000E+00	2.3016E-02	0.000E+00	3.264E+01
4.060054E-02	7.16951E+00	0.0000E+00	0.0000E+00	2.8447E-02	0.000E+00	3.054E+01
4.340198E-02	7.03807E+00	0.0000E+00	0.0000E+00	3.4993E-02	0.000E+00	2.857E+01
4.639671E-02	6.88151E+00	0.0000E+00	0.0000E+00	4.2843E-02	0.000E+00	2.672E+01
4.959809E-02	6.69323E+00	0.0000E+00	0.0000E+00	5.2208E-02	0.000E+00	2.500E+01
5.302035E-02	6.46382E+00	0.0000E+00	0.0000E+00	6.3326E-02	0.000E+00	2.338E+01
5.667876E-02	6.17882E+00	0.0000E+00	0.0000E+00	7.6457E-02	0.000E+00	2.187E+01
6.058959E-02	5.81322E+00	0.0000E+00	0.0000E+00	9.1889E-02	0.000E+00	2.046E+01
6.477028E-02	5.31115E+00	0.0000E+00	0.0000E+00	1.0993E-01	0.000E+00	1.914E+01
6.762000E-02	4.81939E+00	0.0000E+00	0.0000E+00	1.2312E-01	0.000E+00	1.834E+01
6.869800E-02	4.49210E+00	0.0000E+00	0.0000E+00	1.2829E-01	0.000E+00	1.805E+01
6.893100E-02	4.31259E+00	0.0000E+00	0.0000E+00	1.2942E-01	0.000E+00	1.799E+01
6.923942E-02	4.34562E+00	2.8116E-01	2.1385E+03	1.3093E-01	0.000E+00	1.791E+01
6.934500E-02	4.35127E+00	2.8479E-01	2.1628E+03	1.3144E-01	0.000E+00	1.788E+01
6.974950E-02	4.30405E+00	2.9910E-01	2.2583E+03	1.3343E-01	0.000E+00	1.778E+01
7.002990E-02	4.18899E+00	3.0939E-01	2.3266E+03	1.3482E-01	0.000E+00	1.770E+01
7.038000E-02	4.22950E+00	5.0909E-01	3.8094E+03	1.3656E-01	0.000E+00	1.762E+01
7.045050E-02	4.23437E+00	5.1341E-01	3.8379E+03	1.3691E-01	0.000E+00	1.760E+01
7.150200E-02	4.18378E+00	5.8193E-01	4.2861E+03	1.4220E-01	0.000E+00	1.734E+01
7.401695E-02	3.89155E+00	7.7949E-01	5.5461E+03	1.5523E-01	0.000E+00	1.675E+01
7.912411E-02	3.19834E+00	1.3532E+00	9.0066E+03	1.8323E-01	0.000E+00	1.567E+01
8.458368E-02	2.50987E+00	2.1831E+00	1.3592E+04	2.1533E-01	0.000E+00	1.466E+01
9.041995E-02	1.91726E+00	3.2703E+00	1.9048E+04	2.5194E-01	0.000E+00	1.371E+01
9.665893E-02	1.50831E+00	4.5908E+00	2.5012E+04	2.9349E-01	0.000E+00	1.283E+01
1.033284E-01	1.35641E+00	6.0881E+00	3.1029E+04	3.4042E-01	0.000E+00	1.200E+01
1.104581E-01	1.50912E+00	7.6828E+00	3.6629E+04	3.9316E-01	0.000E+00	1.122E+01
1.180797E-01	1.98211E+00	9.2846E+00	4.1409E+04	4.5215E-01	0.000E+00	1.050E+01
1.262272E-01	2.75914E+00	1.0806E+01	4.5083E+04	5.1779E-01	0.000E+00	9.822E+00
1.349368E-01	3.79675E+00	1.2171E+01	4.7502E+04	5.9048E-01	0.000E+00	9.188E+00
1.442475E-01	5.03081E+00	1.3325E+01	4.8649E+04	6.7058E-01	0.000E+00	8.595E+00
1.542005E-01	6.38104E+00	1.4233E+01	4.8610E+04	7.5841E-01	0.000E+00	8.040E+00
1.648404E-01	7.74433E+00	1.4882E+01	4.7544E+04	8.5423E-01	0.000E+00	7.521E+00
1.762144E-01	8.90219E+00	1.5273E+01	4.5645E+04	9.5826E-01	0.000E+00	7.036E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.778700E-01	8.99692E+00	1.5308E+01	4.5324E+04	9.7351E-01	0.000E+00	6.970E+00
1.805925E-01	8.93602E+00	1.5355E+01	4.4778E+04	9.9862E-01	0.000E+00	6.865E+00
1.813185E-01	8.59461E+00	1.5366E+01	4.4629E+04	1.0053E+00	0.000E+00	6.838E+00
1.824075E-01	9.11030E+00	1.6196E+01	4.6760E+04	1.0154E+00	0.000E+00	6.797E+00
1.851300E-01	9.71976E+00	1.6253E+01	4.6235E+04	1.0406E+00	0.000E+00	6.697E+00
1.855140E-01	9.77847E+00	1.6260E+01	4.6160E+04	1.0441E+00	0.000E+00	6.683E+00
1.883732E-01	1.00811E+01	1.6308E+01	4.5592E+04	1.0706E+00	0.000E+00	6.582E+00
1.891107E-01	1.00116E+01	1.6318E+01	4.5443E+04	1.0775E+00	0.000E+00	6.556E+00
1.902465E-01	1.03475E+01	1.6685E+01	4.6188E+04	1.0880E+00	0.000E+00	6.517E+00
1.930860E-01	1.08833E+01	1.6730E+01	4.5630E+04	1.1144E+00	0.000E+00	6.421E+00
2.013709E-01	1.20378E+01	1.6812E+01	4.3969E+04	1.1914E+00	0.000E+00	6.157E+00
2.152655E-01	1.36565E+01	1.6809E+01	4.1123E+04	1.3206E+00	0.000E+00	5.760E+00
2.301188E-01	1.51121E+01	1.6649E+01	3.8101E+04	1.4580E+00	0.000E+00	5.388E+00
2.459970E-01	1.63544E+01	1.6352E+01	3.5007E+04	1.6035E+00	0.000E+00	5.040E+00
2.513700E-01	1.66405E+01	1.6231E+01	3.4005E+04	1.6523E+00	0.000E+00	4.932E+00
2.552175E-01	1.66393E+01	1.6139E+01	3.3302E+04	1.6870E+00	0.000E+00	4.858E+00
2.562435E-01	1.63641E+01	1.6114E+01	3.3117E+04	1.6963E+00	0.000E+00	4.839E+00
2.577825E-01	1.68336E+01	1.6768E+01	3.4255E+04	1.7101E+00	0.000E+00	4.810E+00
2.616300E-01	1.74254E+01	1.6676E+01	3.3567E+04	1.7447E+00	0.000E+00	4.739E+00
2.629708E-01	1.75748E+01	1.6643E+01	3.3331E+04	1.7567E+00	0.000E+00	4.715E+00
2.811158E-01	1.91091E+01	1.6171E+01	3.2025E+04	1.9171E+00	0.000E+00	4.410E+00
3.005128E-01	2.03881E+01	1.5613E+01	2.7361E+04	2.0843E+00	0.000E+00	4.126E+00
3.212482E-01	2.15199E+01	1.4981E+01	2.4559E+04	2.2575E+00	0.000E+00	3.859E+00
3.434143E-01	2.25220E+01	1.4297E+01	2.1925E+04	2.4360E+00	0.000E+00	3.610E+00
3.671099E-01	2.34034E+01	1.3578E+01	1.9479E+04	2.6189E+00	0.000E+00	3.377E+00
3.924405E-01	2.41723E+01	1.2841E+01	1.7233E+04	2.8052E+00	0.000E+00	3.159E+00
4.195189E-01	2.48364E+01	1.2099E+01	1.5188E+04	2.9939E+00	0.000E+00	2.955E+00
4.484657E-01	2.54036E+01	1.1362E+01	1.3342E+04	3.1838E+00	0.000E+00	2.765E+00
4.794098E-01	2.58819E+01	1.0638E+01	1.1686E+04	3.3736E+00	0.000E+00	2.586E+00
5.124891E-01	2.62785E+01	9.9340E+00	1.0208E+04	3.5622E+00	0.000E+00	2.419E+00
5.478508E-01	2.66073E+01	9.2552E+00	8.8968E+03	3.7481E+00	0.000E+00	2.263E+00
5.856525E-01	2.68654E+01	8.6047E+00	7.7376E+03	3.9301E+00	0.000E+00	2.117E+00
6.260625E-01	2.70567E+01	7.9851E+00	6.7170E+03	4.1068E+00	0.000E+00	1.980E+00
6.692609E-01	2.71895E+01	7.3977E+00	5.8212E+03	4.2768E+00	0.000E+00	1.853E+00
7.154399E-01	2.72671E+01	6.8432E+00	5.0373E+03	4.4389E+00	0.000E+00	1.733E+00
7.648052E-01	2.72913E+01	6.3209E+00	4.3525E+03	4.5918E+00	0.000E+00	1.621E+00
8.175768E-01	2.72621E+01	5.8297E+00	3.7552E+03	4.7343E+00	0.000E+00	1.516E+00
8.739896E-01	2.71732E+01	5.3703E+00	3.2360E+03	4.8653E+00	0.000E+00	1.419E+00
9.342948E-01	2.70208E+01	4.9433E+00	2.7864E+03	4.9837E+00	0.000E+00	1.327E+00
9.987612E-01	2.67955E+01	4.5485E+00	2.3984E+03	5.0887E+00	0.000E+00	1.241E+00
1.067676E+00	2.65379E+01	4.1007E+00	2.0227E+03	5.1794E+00	0.000E+00	1.161E+00
1.141345E+00	2.60625E+01	3.6973E+00	1.7060E+03	5.2553E+00	0.000E+00	1.086E+00
1.220098E+00	2.53546E+01	3.3375E+00	1.4406E+03	5.3158E+00	0.000E+00	1.016E+00
1.304285E+00	2.42697E+01	3.0148E+00	1.2173E+03	5.3604E+00	0.000E+00	9.506E-01
1.394281E+00	2.23616E+01	2.7096E+00	1.0234E+03	5.3891E+00	0.000E+00	8.892E-01
1.490486E+00	1.73880E+01	2.4388E+00	8.6170E+02	5.4018E+00	0.000E+00	8.318E-01
1.518902E+00	1.32627E+01	2.3680E+00	8.2103E+02	5.4024E+00	0.000E+00	8.163E-01
1.542151E+00	2.54967E+00	2.3127E+00	7.8979E+02	5.4020E+00	0.000E+00	8.040E-01
1.548350E+00	-1.25724E+01	2.2984E+00	7.8175E+02	5.4018E+00	0.000E+00	8.008E-01
1.557650E+00	8.38204E+00	3.2040E+01	1.0832E+04	5.4013E+00	0.000E+00	7.960E-01
1.564080E+00	1.52813E+01	2.8654E+01	9.6481E+03	5.4009E+00	0.000E+00	7.927E-01
1.580898E+00	2.08769E+01	2.1543E+01	7.1765E+03	5.3996E+00	0.000E+00	7.843E-01
1.588020E+00	1.99057E+01	1.9154E+01	6.3519E+03	5.3989E+00	0.000E+00	7.807E-01
1.593329E+00	1.58089E+01	1.7570E+01	5.8073E+03	5.3984E+00	0.000E+00	7.781E-01
1.594404E+00	1.34461E+01	1.7268E+01	5.7038E+03	5.3983E+00	0.000E+00	7.776E-01
1.603980E+00	2.46085E+01	2.9439E+01	9.6657E+03	5.3972E+00	0.000E+00	7.730E-01
1.627920E+00	3.16957E+01	1.9982E+01	6.4643E+03	5.3939E+00	0.000E+00	7.616E-01
1.703269E+00	3.00793E+01	1.0728E+01	3.3169E+03	5.3792E+00	0.000E+00	7.279E-01
1.746360E+00	2.84143E+01	9.6168E+00	2.9001E+03	5.3680E+00	0.000E+00	7.100E-01
1.773090E+00	2.70566E+01	9.3298E+00	2.7711E+03	5.3602E+00	0.000E+00	6.993E-01
1.780218E+00	2.59804E+01	9.3007E+00	2.7514E+03	5.3580E+00	0.000E+00	6.965E-01
1.790910E+00	2.68223E+01	1.1188E+01	3.2899E+03	5.3546E+00	0.000E+00	6.923E-01
1.817640E+00	2.74439E+01	1.1146E+01	3.2293E+03	5.3457E+00	0.000E+00	6.821E-01
1.820795E+00	2.74745E+01	1.1145E+01	3.2237E+03	5.3446E+00	0.000E+00	6.809E-01
1.946430E+00	2.82847E+01	1.1661E+01	3.1549E+03	5.2951E+00	0.000E+00	6.370E-01

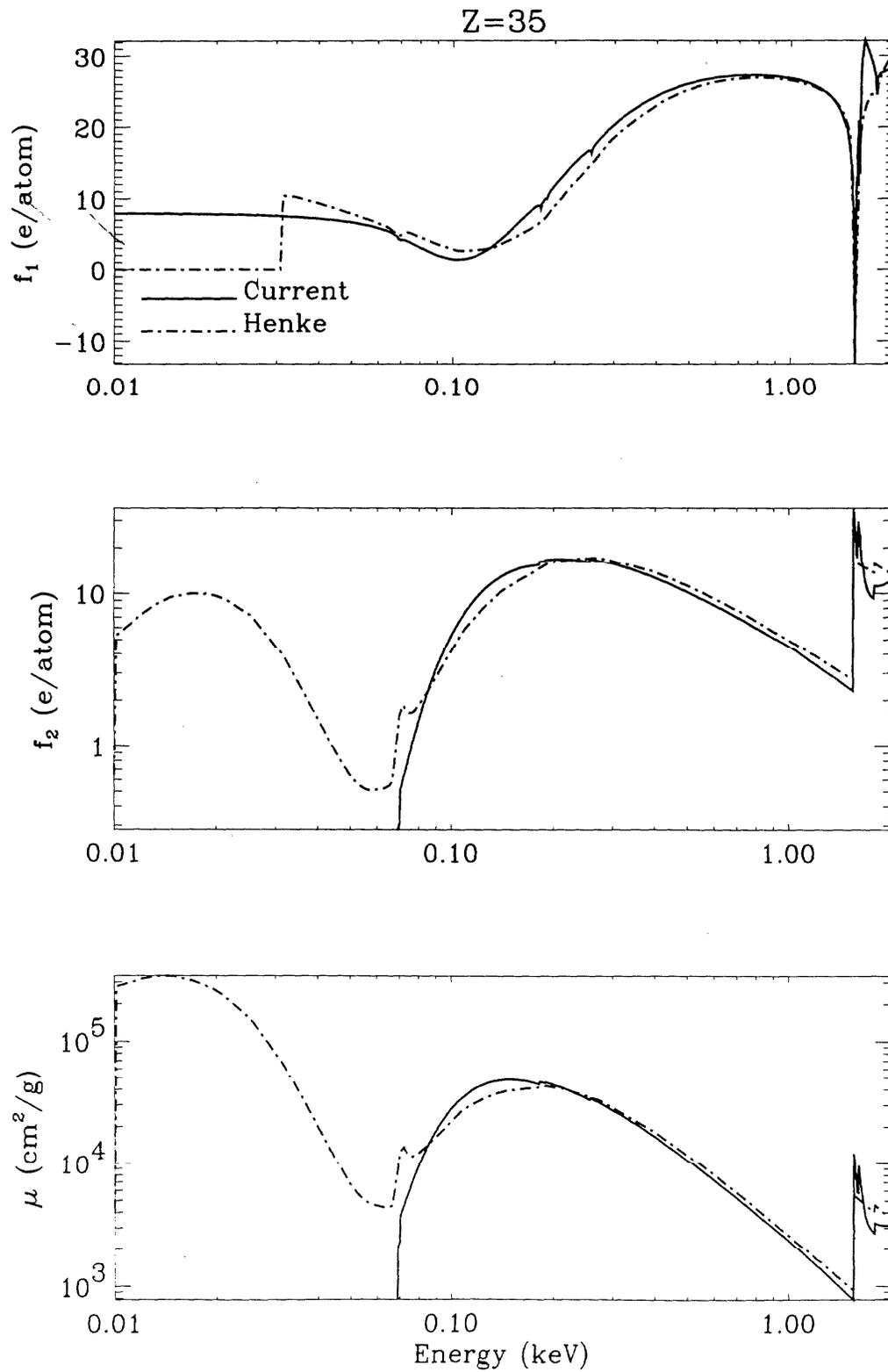
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 277

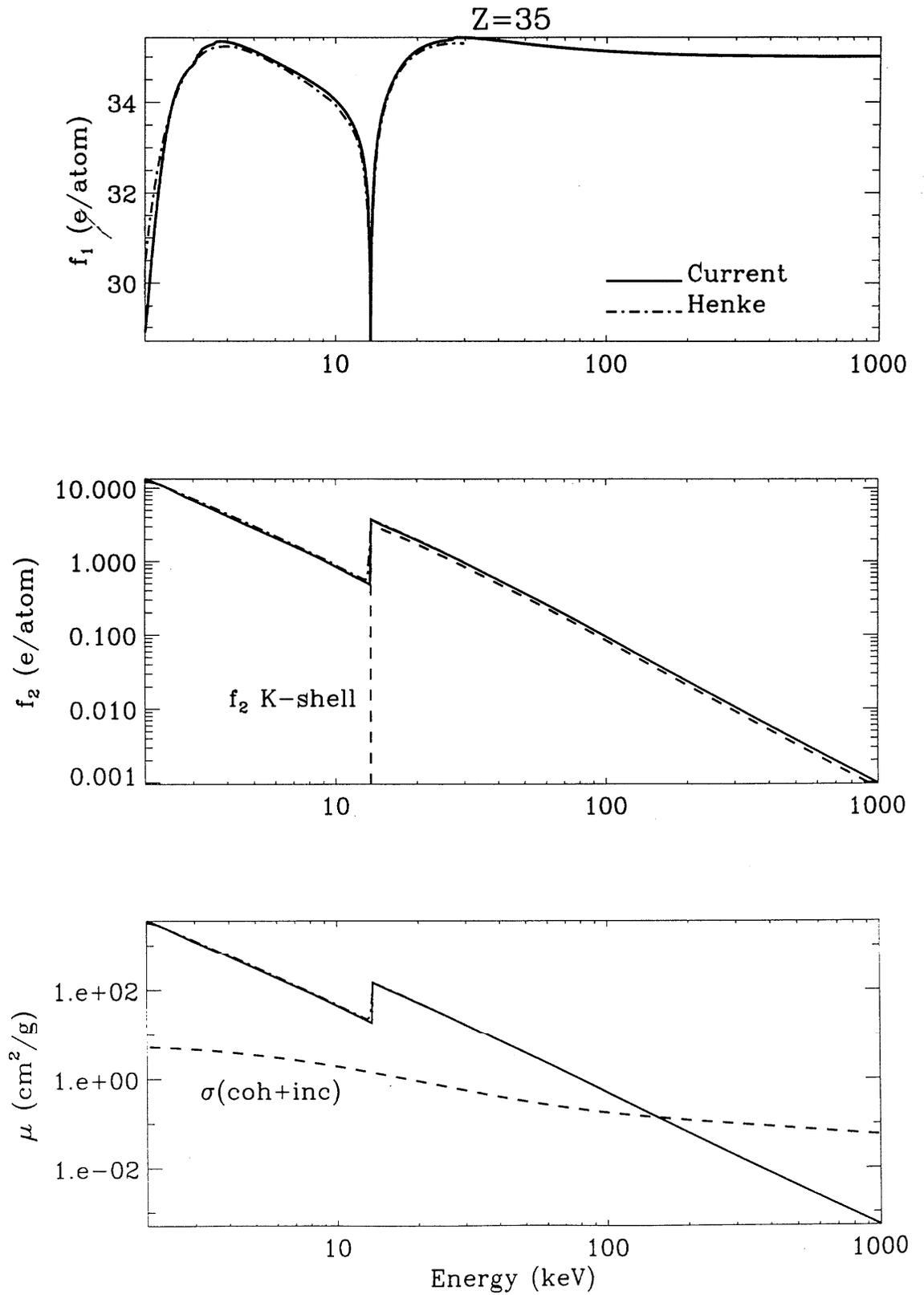
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.080733E+00	3.00857E+01	1.2118E+01	3.0671E+03	5.2312E+00	0.000E+00	5.959E-01
2.224304E+00	3.18836E+01	1.1439E+01	2.7085E+03	5.1538E+00	0.000E+00	5.574E-01
2.377781E+00	3.32153E+01	1.0367E+01	2.2960E+03	5.0635E+00	0.000E+00	5.214E-01
2.541848E+00	3.40528E+01	9.1757E+00	1.9011E+03	4.9614E+00	0.000E+00	4.878E-01
2.717235E+00	3.45094E+01	8.0913E+00	1.5682E+03	4.8483E+00	0.000E+00	4.563E-01
2.904724E+00	3.47478E+01	7.1979E+00	1.3050E+03	4.7253E+00	0.000E+00	4.268E-01
3.105150E+00	3.50325E+01	6.4647E+00	1.0964E+03	4.5935E+00	0.000E+00	3.993E-01
3.319406E+00	3.52142E+01	5.7725E+00	9.1582E+02	4.4539E+00	0.000E+00	3.735E-01
3.548445E+00	3.52801E+01	5.1518E+00	7.6459E+02	4.3078E+00	0.000E+00	3.494E-01
3.793288E+00	3.53412E+01	4.5847E+00	6.3651E+02	4.1561E+00	0.000E+00	3.269E-01
4.055024E+00	3.53219E+01	4.0825E+00	5.3021E+02	4.0000E+00	0.000E+00	3.058E-01
4.334821E+00	3.52768E+01	3.6386E+00	4.4205E+02	3.8406E+00	0.000E+00	2.860E-01
4.633924E+00	3.52144E+01	3.2457E+00	3.6887E+02	3.6789E+00	0.000E+00	2.676E-01
4.953664E+00	3.51403E+01	2.8973E+00	3.0802E+02	3.5159E+00	0.000E+00	2.503E-01
5.295467E+00	3.50582E+01	2.5878E+00	2.5736E+02	3.3526E+00	0.000E+00	2.341E-01
5.660855E+00	3.49709E+01	2.3135E+00	2.1522E+02	3.1899E+00	0.000E+00	2.190E-01
6.051453E+00	3.48805E+01	2.0700E+00	1.8015E+02	3.0285E+00	0.000E+00	2.049E-01
6.469004E+00	3.47887E+01	1.8539E+00	1.5092E+02	2.8693E+00	0.000E+00	1.917E-01
6.915365E+00	3.46965E+01	1.6587E+00	1.2632E+02	2.7129E+00	0.000E+00	1.793E-01
7.392525E+00	3.45988E+01	1.4787E+00	1.0534E+02	2.5600E+00	0.000E+00	1.677E-01
7.902609E+00	3.44956E+01	1.3179E+00	8.7827E+01	2.4110E+00	0.000E+00	1.569E-01
8.447890E+00	3.43844E+01	1.1723E+00	7.3078E+01	2.2666E+00	0.000E+00	1.468E-01
9.030794E+00	3.42667E+01	1.0403E+00	6.0665E+01	2.1270E+00	0.000E+00	1.373E-01
9.653919E+00	3.41242E+01	9.1328E-01	4.9821E+01	1.9926E+00	0.000E+00	1.284E-01
1.032004E+01	3.39494E+01	8.0257E-01	4.0956E+01	1.8636E+00	0.000E+00	1.201E-01
1.103212E+01	3.37255E+01	7.0596E-01	3.3700E+01	1.7403E+00	0.000E+00	1.124E-01
1.179334E+01	3.34058E+01	6.2158E-01	2.7757E+01	1.6228E+00	0.000E+00	1.051E-01
1.260708E+01	3.28304E+01	5.4782E-01	2.2884E+01	1.5112E+00	0.000E+00	9.834E-02
1.320423E+01	3.17466E+01	5.0214E-01	2.0027E+01	1.4372E+00	0.000E+00	9.390E-02
1.340633E+01	3.03664E+01	4.8804E-01	1.9172E+01	1.4136E+00	0.000E+00	9.248E-02
1.346023E+01	2.87000E+01	4.8439E-01	1.8952E+01	1.4074E+00	0.000E+00	9.211E-02
1.347697E+01	2.71626E+01	3.8023E+00	1.4858E+02	1.4055E+00	1.297E+02	9.200E-02
1.354107E+01	3.04042E+01	3.7655E+00	1.4645E+02	1.3982E+00	1.278E+02	9.156E-02
1.374317E+01	3.19450E+01	3.6529E+00	1.3998E+02	1.3756E+00	1.221E+02	9.022E-02
1.440688E+01	3.33364E+01	3.3331E+00	1.2184E+02	1.3056E+00	1.062E+02	8.606E-02
1.540095E+01	3.41052E+01	2.9803E+00	1.0191E+02	1.2116E+00	8.901E+01	8.050E-02
1.646367E+01	3.45298E+01	2.6831E+00	8.5828E+01	1.1234E+00	7.516E+01	7.531E-02
1.759961E+01	3.48171E+01	2.4201E+00	7.2416E+01	1.0407E+00	6.358E+01	7.045E-02
1.881398E+01	3.50169E+01	2.1650E+00	6.0601E+01	9.6345E-01	5.327E+01	6.590E-02
2.011215E+01	3.51527E+01	1.9335E+00	5.0630E+01	8.9149E-01	4.455E+01	6.165E-02
2.149988E+01	3.52451E+01	1.7246E+00	4.2244E+01	8.2461E-01	3.719E+01	5.767E-02
2.298338E+01	3.53066E+01	1.5372E+00	3.5223E+01	7.6258E-01	3.102E+01	5.395E-02
2.456923E+01	3.53461E+01	1.3700E+00	2.9365E+01	7.0519E-01	2.587E+01	5.046E-02
2.626450E+01	3.53706E+01	1.2213E+00	2.4489E+01	6.5219E-01	2.158E+01	4.721E-02
2.807676E+01	3.54243E+01	1.0819E+00	2.0294E+01	6.0336E-01	1.790E+01	4.416E-02
3.001405E+01	3.54242E+01	9.5548E-01	1.6765E+01	5.5846E-01	1.479E+01	4.131E-02
3.208502E+01	3.54156E+01	8.4388E-01	1.3851E+01	5.1724E-01	1.223E+01	3.864E-02
3.429889E+01	3.54016E+01	7.4531E-01	1.1444E+01	4.7946E-01	1.011E+01	3.615E-02
3.666551E+01	3.53841E+01	6.5825E-01	9.4547E+00	4.4490E-01	8.356E+00	3.381E-02
3.919543E+01	3.53646E+01	5.8121E-01	7.8092E+00	4.1333E-01	6.907E+00	3.163E-02
4.189992E+01	3.53438E+01	5.1301E-01	6.4479E+00	3.8452E-01	5.710E+00	2.959E-02
4.479101E+01	3.53225E+01	4.5284E-01	5.3244E+00	3.5827E-01	4.720E+00	2.768E-02
4.788159E+01	3.53012E+01	3.9976E-01	4.3969E+00	3.3436E-01	3.902E+00	2.589E-02
5.118542E+01	3.52804E+01	3.5293E-01	3.6312E+00	3.1262E-01	3.225E+00	2.422E-02
5.471721E+01	3.52604E+01	3.1159E-01	2.9990E+00	2.9285E-01	2.666E+00	2.266E-02
5.849270E+01	3.52416E+01	2.7507E-01	2.4766E+00	2.7489E-01	2.203E+00	2.120E-02
6.252870E+01	3.52234E+01	2.4139E-01	2.0331E+00	2.5856E-01	1.809E+00	1.983E-02
6.684318E+01	3.52057E+01	2.1184E-01	1.6690E+00	2.4373E-01	1.485E+00	1.855E-02
7.145536E+01	3.51888E+01	1.8592E-01	1.3702E+00	2.3024E-01	1.219E+00	1.735E-02
7.638578E+01	3.51728E+01	1.6317E-01	1.1250E+00	2.1798E-01	1.001E+00	1.623E-02
8.165640E+01	3.51580E+01	1.4307E-01	9.2273E-01	2.0681E-01	8.205E-01	1.518E-02
8.729069E+01	3.51442E+01	1.2516E-01	7.5510E-01	1.9663E-01	6.711E-01	1.420E-02
9.331374E+01	3.51312E+01	1.0949E-01	6.1795E-01	1.8733E-01	5.490E-01	1.329E-02
9.975239E+01	3.51191E+01	9.5793E-02	5.0573E-01	1.7882E-01	4.490E-01	1.243E-02
1.066353E+02	3.51080E+01	8.3810E-02	4.1391E-01	1.7102E-01	3.673E-01	1.163E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.139931E+02	3.50977E+01	7.3328E-02	3.3877E-01	1.6385E-01	3.004E-01	1.088E-02
1.218587E+02	3.50883E+01	6.4159E-02	2.7728E-01	1.5724E-01	2.457E-01	1.017E-02
1.302669E+02	3.50798E+01	5.6139E-02	2.2696E-01	1.5113E-01	2.010E-01	9.518E-03
1.392553E+02	3.50719E+01	4.9123E-02	1.8578E-01	1.4546E-01	1.644E-01	8.903E-03
1.488640E+02	3.50648E+01	4.2986E-02	1.5207E-01	1.4017E-01	1.345E-01	8.329E-03
1.591356E+02	3.50583E+01	3.7616E-02	1.2449E-01	1.3524E-01	1.100E-01	7.791E-03
1.701159E+02	3.50524E+01	3.2918E-02	1.0191E-01	1.3061E-01	8.996E-02	7.288E-03
1.818539E+02	3.50471E+01	2.8808E-02	8.3427E-02	1.2625E-01	7.358E-02	6.818E-03
1.944018E+02	3.50423E+01	2.5212E-02	6.8300E-02	1.2212E-01	6.018E-02	6.378E-03
2.078156E+02	3.50380E+01	2.2066E-02	5.5917E-02	1.1821E-01	4.923E-02	5.966E-03
2.221548E+02	3.50340E+01	1.9312E-02	4.5781E-02	1.1449E-01	4.026E-02	5.581E-03
2.374835E+02	3.50305E+01	1.6903E-02	3.7483E-02	1.1094E-01	3.293E-02	5.221E-03
2.538699E+02	3.50273E+01	1.4795E-02	3.0691E-02	1.0753E-01	2.694E-02	4.884E-03
2.713869E+02	3.50245E+01	1.2950E-02	2.5129E-02	1.0425E-01	2.203E-02	4.569E-03
2.901126E+02	3.50219E+01	1.1335E-02	2.0576E-02	1.0110E-01	1.802E-02	4.274E-03
3.101304E+02	3.50196E+01	9.9222E-03	1.6849E-02	9.8048E-02	1.474E-02	3.998E-03
3.315294E+02	3.50175E+01	8.6856E-03	1.3797E-02	9.5096E-02	1.206E-02	3.740E-03
3.544049E+02	3.50156E+01	7.6033E-03	1.1298E-02	9.2234E-02	9.862E-03	3.498E-03
3.788588E+02	3.50139E+01	6.6560E-03	9.2522E-03	8.9454E-02	8.066E-03	3.273E-03
4.050001E+02	3.50124E+01	5.8269E-03	7.5770E-03	8.6749E-02	6.598E-03	3.061E-03
4.329451E+02	3.50111E+01	5.1012E-03	6.2052E-03	8.4116E-02	5.397E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 281

Kr Z = 36

Atomic weight = 8.38000E+01 g/mol, nominal density ρ (g/cm³) = 3.4840E-03

μ_a (barns/atom) = μ (cm²/g) \times 1.39153E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 5.02152E+05

ν edges. Edge energies (keV):

K		1.43256E+00	L	I	1.92100E+00	L	II	1.72720E+00	L	III	1.67490E+00
M	I	2.88330E-00	M	II	2.22700E-00	M	III	2.13800E-00	M	IV	8.89000E-02
M	V	8.89000E-02									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.3566E-01, -1.4820E-01 e/atom

Nuclear Thomson correction f_{NT} = -8.4840E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	9.29037E+00	0.0000E+00	0.0000E+00	1.6413E-04	0.000E+00	1.160E+02
1.142761E-02	9.28534E+00	0.0000E+00	0.0000E+00	2.2323E-04	0.000E+00	1.085E+02
1.221612E-02	9.27958E+00	0.0000E+00	0.0000E+00	3.0199E-04	0.000E+00	1.015E+02
1.305903E-02	9.27298E+00	0.0000E+00	0.0000E+00	4.0636E-04	0.000E+00	9.494E+01
1.396010E-02	9.26544E+00	0.0000E+00	0.0000E+00	5.4394E-04	0.000E+00	8.881E+01
1.492335E-02	9.25679E+00	0.0000E+00	0.0000E+00	7.2427E-04	0.000E+00	8.308E+01
1.595306E-02	9.24690E+00	0.0000E+00	0.0000E+00	9.5936E-04	0.000E+00	7.772E+01
1.705382E-02	9.23556E+00	0.0000E+00	0.0000E+00	1.2642E-03	0.000E+00	7.270E+01
1.823053E-02	9.22256E+00	0.0000E+00	0.0000E+00	1.6573E-03	0.000E+00	6.801E+01
1.948844E-02	9.20767E+00	0.0000E+00	0.0000E+00	2.1615E-03	0.000E+00	6.362E+01
2.083314E-02	9.19057E+00	0.0000E+00	0.0000E+00	2.8049E-03	0.000E+00	5.951E+01
2.227063E-02	9.17096E+00	0.0000E+00	0.0000E+00	3.6213E-03	0.000E+00	5.567E+01
2.380730E-02	9.14843E+00	0.0000E+00	0.0000E+00	4.6520E-03	0.000E+00	5.208E+01
2.545001E-02	9.12254E+00	0.0000E+00	0.0000E+00	5.9462E-03	0.000E+00	4.872E+01
2.720606E-02	9.09275E+00	0.0000E+00	0.0000E+00	7.5629E-03	0.000E+00	4.557E+01
2.908327E-02	9.05845E+00	0.0000E+00	0.0000E+00	9.5718E-03	0.000E+00	4.263E+01
3.109002E-02	9.01890E+00	0.0000E+00	0.0000E+00	1.2055E-02	0.000E+00	3.988E+01
3.323523E-02	8.97325E+00	0.0000E+00	0.0000E+00	1.5109E-02	0.000E+00	3.731E+01
3.552846E-02	8.92046E+00	0.0000E+00	0.0000E+00	1.8845E-02	0.000E+00	3.490E+01
3.797993E-02	8.85929E+00	0.0000E+00	0.0000E+00	2.3393E-02	0.000E+00	3.264E+01
4.060054E-02	8.78826E+00	0.0000E+00	0.0000E+00	2.8901E-02	0.000E+00	3.054E+01
4.340198E-02	8.70556E+00	0.0000E+00	0.0000E+00	3.5536E-02	0.000E+00	2.857E+01
4.639671E-02	8.60896E+00	0.0000E+00	0.0000E+00	4.3489E-02	0.000E+00	2.672E+01
4.959809E-02	8.49567E+00	0.0000E+00	0.0000E+00	5.2975E-02	0.000E+00	2.500E+01
5.302035E-02	8.36216E+00	0.0000E+00	0.0000E+00	6.4231E-02	0.000E+00	2.338E+01
5.667876E-02	8.20386E+00	0.0000E+00	0.0000E+00	7.7521E-02	0.000E+00	2.187E+01
6.058959E-02	8.01472E+00	0.0000E+00	0.0000E+00	9.3134E-02	0.000E+00	2.046E+01
6.477028E-02	7.78638E+00	0.0000E+00	0.0000E+00	1.1139E-01	0.000E+00	1.914E+01
6.923942E-02	7.50680E+00	0.0000E+00	0.0000E+00	1.3261E-01	0.000E+00	1.791E+01
7.401695E-02	7.15722E+00	0.0000E+00	0.0000E+00	1.5718E-01	0.000E+00	1.675E+01
7.912411E-02	6.70431E+00	0.0000E+00	0.0000E+00	1.8548E-01	0.000E+00	1.567E+01
8.458368E-02	6.06764E+00	0.0000E+00	0.0000E+00	2.1791E-01	0.000E+00	1.466E+01
8.712200E-02	5.64666E+00	0.0000E+00	0.0000E+00	2.3371E-01	0.000E+00	1.423E+01
8.845550E-02	5.27889E+00	0.0000E+00	0.0000E+00	2.4218E-01	0.000E+00	1.402E+01
8.881110E-02	5.01683E+00	0.0000E+00	0.0000E+00	2.4446E-01	0.000E+00	1.396E+01
8.934450E-02	5.11898E+00	4.1142E-01	2.3124E+03	2.4790E-01	0.000E+00	1.388E+01
9.041995E-02	5.09657E+00	4.6449E-01	2.5796E+03	2.5489E-01	0.000E+00	1.371E+01
9.067800E-02	5.07502E+00	4.7811E-01	2.6476E+03	2.5657E-01	0.000E+00	1.367E+01
9.665893E-02	4.30507E+00	9.1368E-01	4.7467E+03	2.9685E-01	0.000E+00	1.283E+01
1.033284E-01	3.35762E+00	1.7260E+00	8.3879E+03	3.4423E-01	0.000E+00	1.200E+01
1.104581E-01	2.47607E+00	2.9189E+00	1.3269E+04	3.9747E-01	0.000E+00	1.122E+01
1.180797E-01	1.80997E+00	4.4806E+00	1.9054E+04	4.5700E-01	0.000E+00	1.050E+01
1.262272E-01	1.49791E+00	6.3314E+00	2.5187E+04	5.2324E-01	0.000E+00	9.822E+00
1.349368E-01	1.63144E+00	8.3376E+00	3.1027E+04	5.9658E-01	0.000E+00	9.188E+00
1.442475E-01	2.23705E+00	1.0342E+01	3.6001E+04	6.7739E-01	0.000E+00	8.595E+00
1.542005E-01	3.27653E+00	1.2194E+01	3.9709E+04	7.6598E-01	0.000E+00	8.040E+00
1.648404E-01	4.66077E+00	1.3777E+01	4.1968E+04	8.6262E-01	0.000E+00	7.521E+00
1.762144E-01	6.26791E+00	1.5016E+01	4.2790E+04	9.6753E-01	0.000E+00	7.036E+00
1.883732E-01	7.95392E+00	1.5880E+01	4.2333E+04	1.0809E+00	0.000E+00	6.582E+00
2.013709E-01	9.09269E+00	1.6377E+01	4.0838E+04	1.2026E+00	0.000E+00	6.157E+00
2.095240E-01	1.01694E+01	1.6509E+01	3.9566E+04	1.2791E+00	0.000E+00	5.917E+00
2.127310E-01	1.00543E+01	1.6530E+01	3.9019E+04	1.3091E+00	0.000E+00	5.828E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.135862E-01	9.60025E+00	1.6533E+01	3.8870E+04	1.3172E+00	0.000E+00	5.805E+00
2.148690E-01	1.02597E+01	1.7597E+01	4.1125E+04	1.3292E+00	0.000E+00	5.770E+00
2.152655E-01	1.04030E+01	1.7602E+01	4.1059E+04	1.3329E+00	0.000E+00	5.760E+00
2.182460E-01	1.10418E+01	1.7627E+01	4.0556E+04	1.3608E+00	0.000E+00	5.681E+00
2.215865E-01	1.14044E+01	1.7641E+01	3.9978E+04	1.3920E+00	0.000E+00	5.595E+00
2.224773E-01	1.13064E+01	1.7643E+01	3.9822E+04	1.4003E+00	0.000E+00	5.573E+00
2.238135E-01	1.17277E+01	1.8100E+01	4.0609E+04	1.4127E+00	0.000E+00	5.540E+00
2.271540E-01	1.23826E+01	1.8110E+01	4.0034E+04	1.4439E+00	0.000E+00	5.458E+00
2.301188E-01	1.28377E+01	1.8110E+01	3.9518E+04	1.4714E+00	0.000E+00	5.388E+00
2.459970E-01	1.48064E+01	1.7991E+01	3.6724E+04	1.6181E+00	0.000E+00	5.040E+00
2.629708E-01	1.64724E+01	1.7686E+01	3.3772E+04	1.7725E+00	0.000E+00	4.715E+00
2.811158E-01	1.77817E+01	1.7230E+01	3.0777E+04	1.9343E+00	0.000E+00	4.410E+00
2.825634E-01	1.78453E+01	1.7189E+01	3.0548E+04	1.9470E+00	0.000E+00	4.388E+00
2.86883E-01	1.78572E+01	1.7066E+01	2.9872E+04	1.9849E+00	0.000E+00	4.322E+00
2.880417E-01	1.75673E+01	1.7033E+01	2.9694E+04	1.9950E+00	0.000E+00	4.304E+00
2.897716E-01	1.80720E+01	1.7719E+01	3.0706E+04	2.0101E+00	0.000E+00	4.279E+00
2.940966E-01	1.87115E+01	1.7597E+01	3.0045E+04	2.0476E+00	0.000E+00	4.216E+00
3.005128E-01	1.93348E+01	1.7410E+01	2.9091E+04	2.1028E+00	0.000E+00	4.126E+00
3.212482E-01	2.08660E+01	1.6780E+01	2.6229E+04	2.2775E+00	0.000E+00	3.859E+00
3.434143E-01	2.21571E+01	1.6086E+01	2.3521E+04	2.4574E+00	0.000E+00	3.610E+00
3.671099E-01	2.32881E+01	1.5344E+01	2.0988E+04	2.6419E+00	0.000E+00	3.377E+00
3.924405E-01	2.42803E+01	1.4562E+01	1.8633E+04	2.8298E+00	0.000E+00	3.159E+00
4.195189E-01	2.51426E+01	1.3759E+01	1.6469E+04	3.0201E+00	0.000E+00	2.955E+00
4.484657E-01	2.58850E+01	1.2949E+01	1.4499E+04	3.2116E+00	0.000E+00	2.765E+00
4.794098E-01	2.65175E+01	1.2145E+01	1.2721E+04	3.4031E+00	0.000E+00	2.586E+00
5.124891E-01	2.70500E+01	1.1356E+01	1.1127E+04	3.5934E+00	0.000E+00	2.419E+00
5.478508E-01	2.74917E+01	1.0589E+01	9.7060E+03	3.7811E+00	0.000E+00	2.263E+00
5.856525E-01	2.78510E+01	9.8506E+00	8.4461E+03	3.9648E+00	0.000E+00	2.117E+00
6.260625E-01	2.81356E+01	9.1436E+00	7.3339E+03	4.1432E+00	0.000E+00	1.980E+00
6.692609E-01	2.83463E+01	8.4710E+00	6.3559E+03	4.3149E+00	0.000E+00	1.853E+00
7.154399E-01	2.85005E+01	7.8343E+00	5.4987E+03	4.4787E+00	0.000E+00	1.733E+00
7.648052E-01	2.85971E+01	7.2342E+00	4.7498E+03	4.6332E+00	0.000E+00	1.621E+00
8.175768E-01	2.86402E+01	6.6708E+00	4.0972E+03	4.7773E+00	0.000E+00	1.516E+00
8.739896E-01	2.86334E+01	6.1435E+00	3.5297E+03	4.9099E+00	0.000E+00	1.419E+00
9.342948E-01	2.85810E+01	5.6507E+00	3.0370E+03	5.0298E+00	0.000E+00	1.327E+00
9.987612E-01	2.85173E+01	5.1933E+00	2.6111E+03	5.1362E+00	0.000E+00	1.241E+00
1.067676E+00	2.82840E+01	4.6773E+00	2.1998E+03	5.2283E+00	0.000E+00	1.161E+00
1.141345E+00	2.79355E+01	4.2165E+00	1.8551E+03	5.3054E+00	0.000E+00	1.086E+00
1.220098E+00	2.74513E+01	3.8011E+00	1.5644E+03	5.3670E+00	0.000E+00	1.016E+00
1.304285E+00	2.67719E+01	3.4302E+00	1.3206E+03	5.4127E+00	0.000E+00	9.506E-01
1.394281E+00	2.57671E+01	3.0995E+00	1.1163E+03	5.4423E+00	0.000E+00	8.892E-01
1.490486E+00	2.40810E+01	2.8042E+00	9.4474E+02	5.4557E+00	0.000E+00	8.318E-01
1.593329E+00	2.01715E+01	2.5402E+00	8.0057E+02	5.4529E+00	0.000E+00	7.781E-01
1.641402E+00	1.48693E+01	2.4317E+00	7.4394E+02	5.4466E+00	0.000E+00	7.554E-01
1.666526E+00	4.54605E+00	2.3783E+00	7.1663E+02	5.4421E+00	0.000E+00	7.440E-01
1.673225E+00	-1.00085E+01	2.3639E+00	7.0943E+02	5.4408E+00	0.000E+00	7.410E-01
1.683275E+00	1.01199E+01	3.1022E+01	9.2543E+03	5.4387E+00	0.000E+00	7.366E-01
1.692656E+00	1.82550E+01	2.6779E+01	7.9445E+03	5.4367E+00	0.000E+00	7.325E-01
1.703269E+00	2.18851E+01	2.2746E+01	6.7060E+03	5.4343E+00	0.000E+00	7.279E-01
1.708398E+00	2.24912E+01	2.1048E+01	6.1867E+03	5.4331E+00	0.000E+00	7.257E-01
1.718564E+00	2.14270E+01	1.8094E+01	5.2870E+03	5.4306E+00	0.000E+00	7.214E-01
1.725473E+00	1.50972E+01	1.6362E+01	4.7616E+03	5.4289E+00	0.000E+00	7.186E-01
1.735836E+00	2.56951E+01	2.8190E+01	8.1548E+03	5.4261E+00	0.000E+00	7.143E-01
1.761744E+00	3.23759E+01	1.9486E+01	5.5542E+03	5.4189E+00	0.000E+00	7.038E-01
1.820795E+00	3.18384E+01	1.1709E+01	3.2291E+03	5.4001E+00	0.000E+00	6.809E-01
1.882580E+00	2.96190E+01	9.7402E+00	2.5981E+03	5.3773E+00	0.000E+00	6.586E-01
1.911395E+00	2.83527E+01	9.4114E+00	2.4725E+03	5.3656E+00	0.000E+00	6.487E-01
1.919079E+00	2.72735E+01	9.3520E+00	2.4471E+03	5.3625E+00	0.000E+00	6.461E-01
1.930605E+00	2.80334E+01	1.1232E+01	2.9216E+03	5.3576E+00	0.000E+00	6.422E-01
1.946430E+00	2.84968E+01	1.1190E+01	2.8869E+03	5.3508E+00	0.000E+00	6.370E-01
1.959420E+00	2.86613E+01	1.1173E+01	2.8634E+03	5.3450E+00	0.000E+00	6.328E-01
2.080733E+00	2.93996E+01	1.1507E+01	2.7771E+03	5.2870E+00	0.000E+00	5.959E-01
2.224304E+00	3.10583E+01	1.2000E+01	2.7090E+03	5.2094E+00	0.000E+00	5.744E-01
2.377781E+00	3.28840E+01	1.1339E+01	2.3947E+03	5.1189E+00	0.000E+00	5.214E-01
2.541848E+00	3.41814E+01	1.0258E+01	2.0264E+03	5.0164E+00	0.000E+00	4.878E-01

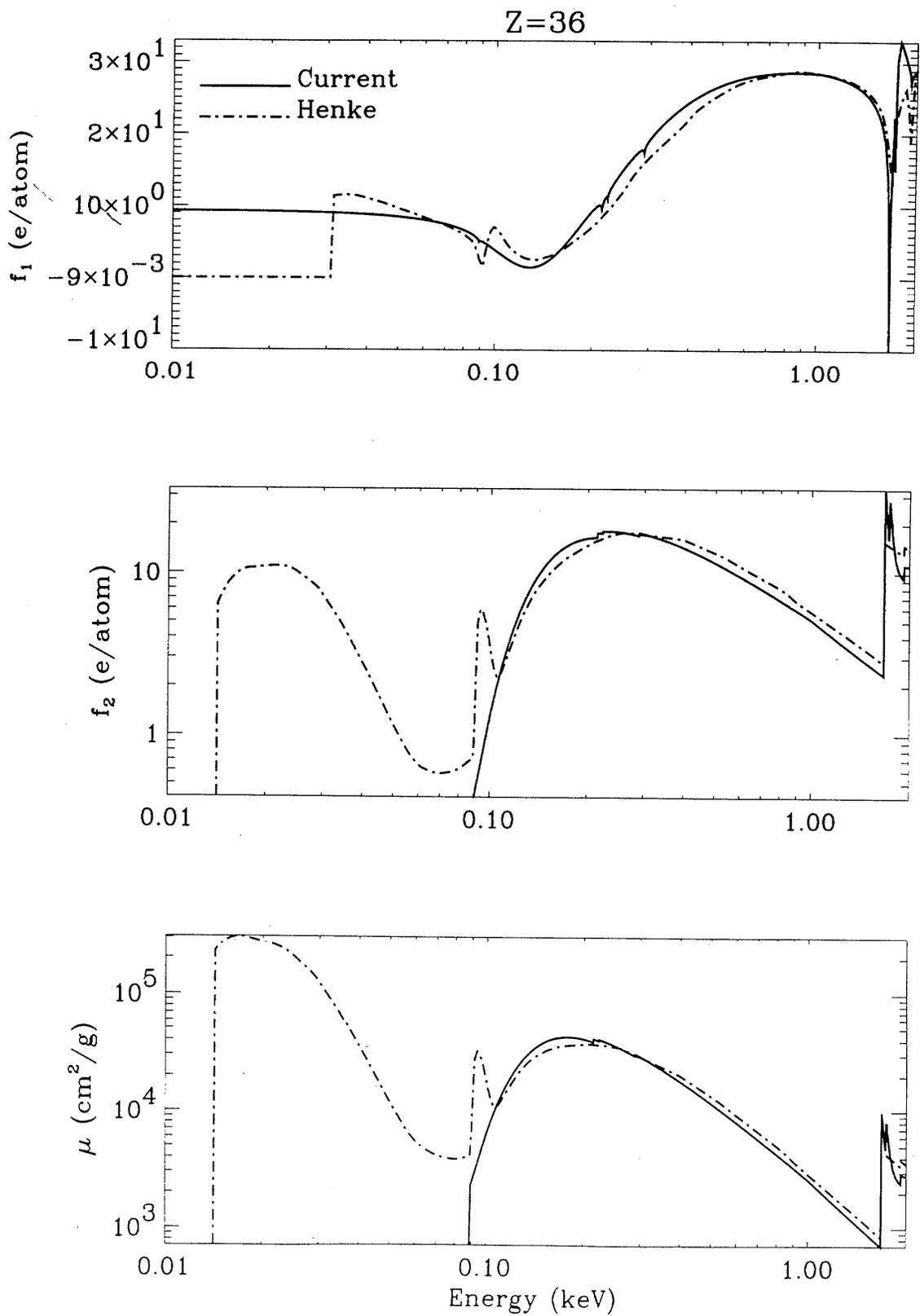
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 283

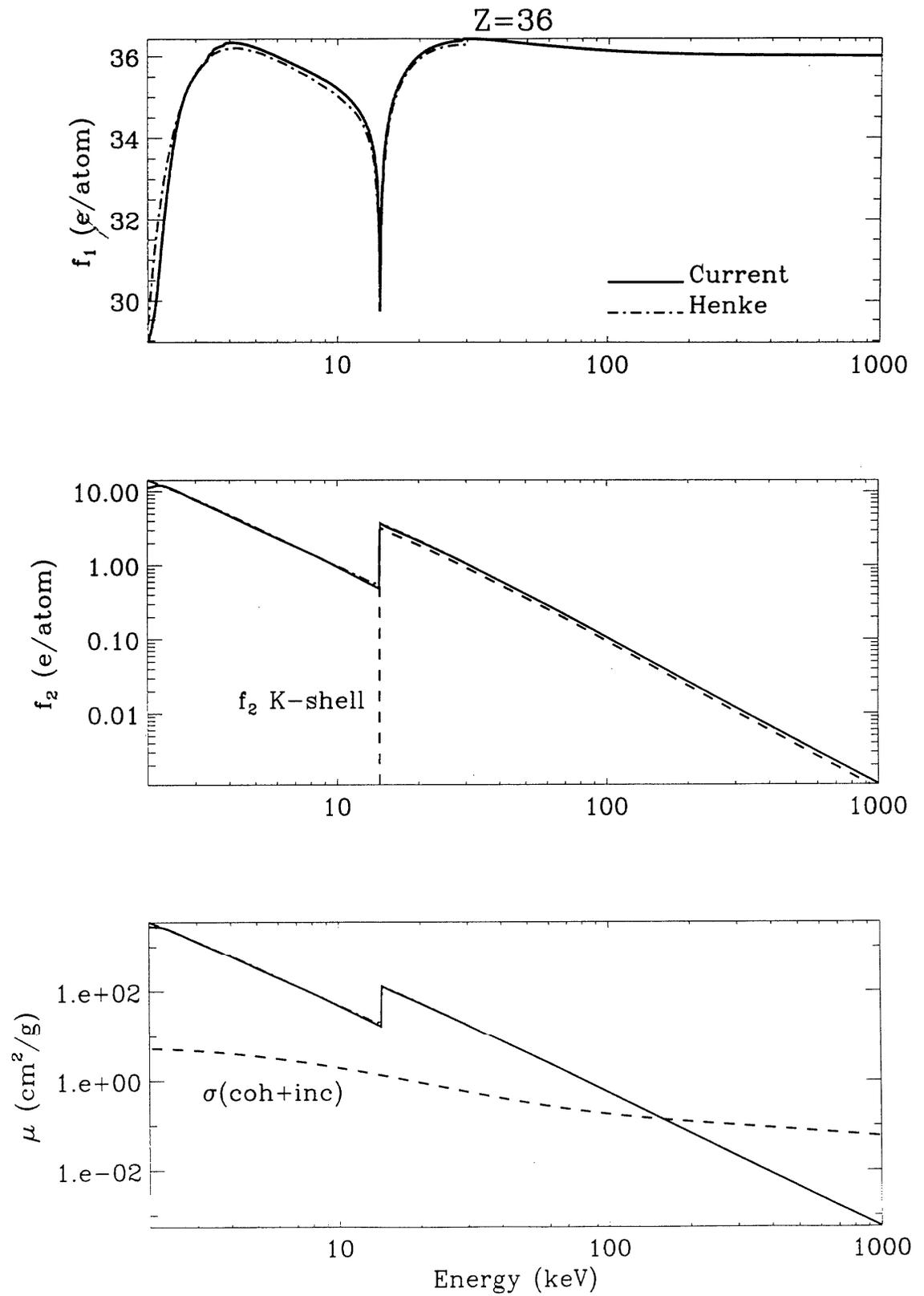
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.717235E+00	3.49786E+01	9.0896E+00	1.6798E+03	4.9028E+00	0.000E+00	4.563E-01
2.904724E+00	3.54158E+01	8.0514E+00	1.3919E+03	4.7791E+00	0.000E+00	4.268E-01
3.105150E+00	3.57012E+01	7.2059E+00	1.1653E+03	4.6465E+00	0.000E+00	3.993E-01
3.319406E+00	3.59085E+01	6.4716E+00	9.7901E+02	4.5061E+00	0.000E+00	3.735E-01
3.548445E+00	3.62018E+01	5.7843E+00	8.1855E+02	4.3588E+00	0.000E+00	3.494E-01
3.793288E+00	3.62741E+01	5.1631E+00	6.8349E+02	4.2060E+00	0.000E+00	3.269E-01
4.055024E+00	3.63433E+01	4.5996E+00	5.6959E+02	4.0487E+00	0.000E+00	3.058E-01
4.334821E+00	3.63289E+01	4.0942E+00	4.7427E+02	3.8879E+00	0.000E+00	2.860E-01
4.633924E+00	3.62864E+01	3.6467E+00	3.9517E+02	3.7247E+00	0.000E+00	2.676E-01
4.953664E+00	3.62252E+01	3.2510E+00	3.2955E+02	3.5602E+00	0.000E+00	2.503E-01
5.295467E+00	3.61515E+01	2.9008E+00	2.7507E+02	3.3953E+00	0.000E+00	2.341E-01
5.660855E+00	3.60696E+01	2.5898E+00	2.2973E+02	3.2309E+00	0.000E+00	2.190E-01
6.051453E+00	3.59821E+01	2.3138E+00	1.9200E+02	3.0679E+00	0.000E+00	2.049E-01
6.469004E+00	3.58912E+01	2.0691E+00	1.6061E+02	2.9069E+00	0.000E+00	1.917E-01
6.915365E+00	3.57984E+01	1.8520E+00	1.3448E+02	2.7488E+00	0.000E+00	1.793E-01
7.392525E+00	3.57052E+01	1.6573E+00	1.1258E+02	2.5941E+00	0.000E+00	1.677E-01
7.902609E+00	3.56076E+01	1.4780E+00	9.3918E+01	2.4434E+00	0.000E+00	1.569E-01
8.447890E+00	3.55052E+01	1.3181E+00	7.8347E+01	2.2972E+00	0.000E+00	1.468E-01
9.030794E+00	3.54026E+01	1.1691E+00	6.5009E+01	2.1559E+00	0.000E+00	1.373E-01
9.653919E+00	3.52769E+01	1.0267E+00	5.3402E+01	2.0197E+00	0.000E+00	1.284E-01
1.032004E+01	3.51272E+01	9.0242E-01	4.3910E+01	1.8891E+00	0.000E+00	1.201E-01
1.103212E+01	3.49475E+01	7.9399E-01	3.6140E+01	1.7641E+00	0.000E+00	1.124E-01
1.179334E+01	3.47178E+01	6.9926E-01	2.9774E+01	1.6450E+00	0.000E+00	1.051E-01
1.260708E+01	3.43871E+01	6.1644E-01	2.4553E+01	1.5318E+00	0.000E+00	9.834E-02
1.347697E+01	3.37744E+01	5.4394E-01	2.0267E+01	1.4246E+00	0.000E+00	9.200E-02
1.403909E+01	3.27699E+01	5.0406E-01	1.8029E+01	1.3619E+00	0.000E+00	8.831E-02
1.425397E+01	3.13987E+01	4.9003E-01	1.7263E+01	1.3391E+00	0.000E+00	8.698E-02
1.431127E+01	2.97438E+01	4.8640E-01	1.7067E+01	1.3332E+00	0.000E+00	8.663E-02
1.440688E+01	3.15725E+01	3.7394E+00	1.3034E+02	1.3233E+00	1.136E+02	8.606E-02
1.461211E+01	3.29645E+01	3.6342E+00	1.2489E+02	1.3026E+00	1.088E+02	8.485E-02
1.540095E+01	3.44353E+01	3.2888E+00	1.0723E+02	1.2279E+00	9.338E+01	8.050E-02
1.646362E+01	3.51565E+01	2.9440E+00	8.9793E+01	1.1383E+00	7.833E+01	7.531E-02
1.759961E+01	3.55643E+01	2.6507E+00	7.5630E+01	1.0543E+00	6.613E+01	7.045E-02
1.881398E+01	3.58418E+01	2.3881E+00	6.3738E+01	9.7591E-01	5.586E+01	6.590E-02
2.011215E+01	3.60333E+01	2.1362E+00	5.3337E+01	9.0282E-01	4.680E+01	6.165E-02
2.149988E+01	3.61637E+01	1.9080E+00	4.4563E+01	8.3486E-01	3.913E+01	5.767E-02
2.298338E+01	3.62526E+01	1.7024E+00	3.7194E+01	7.7183E-01	3.268E+01	5.395E-02
2.456923E+01	3.63124E+01	1.5182E+00	3.1030E+01	7.1350E-01	2.727E+01	5.046E-02
2.626450E+01	3.63531E+01	1.3541E+00	2.5890E+01	6.5964E-01	2.276E+01	4.721E-02
2.807676E+01	3.63793E+01	1.2040E+00	2.1533E+01	6.1000E-01	1.895E+01	4.416E-02
3.001405E+01	3.64257E+01	1.0650E+00	1.7818E+01	5.6435E-01	1.570E+01	4.131E-02
3.208502E+01	3.64237E+01	9.4055E-01	1.4720E+01	5.2244E-01	1.298E+01	3.864E-02
3.429889E+01	3.64141E+01	8.3069E-01	1.2162E+01	4.8404E-01	1.073E+01	3.615E-02
3.666551E+01	3.63994E+01	7.3368E-01	1.0048E+01	4.4891E-01	8.867E+00	3.381E-02
3.919543E+01	3.63815E+01	6.4798E-01	8.3016E+00	4.1682E-01	7.330E+00	3.163E-02
4.189992E+01	3.63617E+01	5.7220E-01	6.8575E+00	3.8755E-01	6.059E+00	2.959E-02
4.479101E+01	3.63407E+01	5.0509E-01	5.6625E+00	3.6088E-01	5.008E+00	2.768E-02
4.788159E+01	3.63194E+01	4.4588E-01	4.6761E+00	3.3660E-01	4.140E+00	2.589E-02
5.118542E+01	3.62981E+01	3.9364E-01	3.8617E+00	3.1453E-01	3.422E+00	2.422E-02
5.471771E+01	3.62774E+01	3.4754E-01	3.1894E+00	2.9447E-01	2.829E+00	2.266E-02
5.849270E+01	3.62575E+01	3.0686E-01	2.6343E+00	2.7626E-01	2.339E+00	2.120E-02
6.252870E+01	3.62388E+01	2.7079E-01	2.1746E+00	2.5972E-01	1.932E+00	1.983E-02
6.684318E+01	3.62206E+01	2.3777E-01	1.7862E+00	2.4470E-01	1.587E+00	1.855E-02
7.145536E+01	3.62030E+01	2.0879E-01	1.4673E+00	2.3107E-01	1.303E+00	1.735E-02
7.638578E+01	3.61863E+01	1.8335E-01	1.2053E+00	2.1867E-01	1.071E+00	1.623E-02
8.165640E+01	3.61708E+01	1.6085E-01	9.8918E-01	2.0740E-01	8.784E-01	1.518E-02
8.729069E+01	3.61562E+01	1.4079E-01	8.0991E-01	1.9714E-01	7.189E-01	1.420E-02
9.331374E+01	3.61424E+01	1.2323E-01	6.6316E-01	1.8779E-01	5.884E-01	1.329E-02
9.975239E+01	3.61295E+01	1.0787E-01	5.4302E-01	1.7924E-01	4.815E-01	1.243E-02
1.066353E+02	3.61175E+01	9.4427E-02	4.4466E-01	1.7142E-01	3.941E-01	1.163E-02
1.139931E+02	3.61065E+01	8.2662E-02	3.6414E-01	1.6424E-01	3.225E-01	1.088E-02
1.218587E+02	3.60964E+01	7.2366E-02	2.9821E-01	1.5763E-01	2.639E-01	1.017E-02
1.302669E+02	3.60871E+01	6.3355E-02	2.4422E-01	1.5153E-01	2.160E-01	9.518E-03
1.392553E+02	3.60786E+01	5.5468E-02	2.0002E-01	1.4588E-01	1.768E-01	8.903E-03
1.488640E+02	3.60709E+01	4.8565E-02	1.6382E-01	1.4063E-01	1.447E-01	8.329E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.591356E+02	3.60639E+01	4.2522E-02	1.3418E-01	1.3573E-01	1.184E-01	7.791E-03
1.701159E+02	3.60575E+01	3.7233E-02	1.0991E-01	1.3114E-01	9.690E-02	7.288E-03
1.818539E+02	3.60517E+01	3.2603E-02	9.0025E-02	1.2683E-01	7.931E-02	6.818E-03
1.944018E+02	3.60465E+01	2.8549E-02	7.3744E-02	1.2276E-01	6.490E-02	6.378E-03
2.078156E+02	3.60417E+01	2.5000E-02	6.0409E-02	1.1890E-01	5.312E-02	5.966E-03
2.221548E+02	3.60374E+01	2.1893E-02	4.9487E-02	1.1523E-01	4.347E-02	5.581E-03
2.374835E+02	3.60336E+01	1.9173E-02	4.0541E-02	1.1173E-01	3.558E-02	5.221E-03
2.538699E+02	3.60301E+01	1.6792E-02	3.3214E-02	1.0838E-01	2.912E-02	4.884E-03
2.713869E+02	3.60269E+01	1.4706E-02	2.7211E-02	1.0515E-01	2.383E-02	4.569E-03
2.901126E+02	3.60241E+01	1.2880E-02	2.2294E-02	1.0205E-01	1.950E-02	4.274E-03
3.101304E+02	3.60216E+01	1.1281E-02	1.8266E-02	9.9051E-02	1.596E-02	3.998E-03
3.315294E+02	3.60193E+01	9.8811E-03	1.4966E-02	9.6148E-02	1.306E-02	3.740E-03
3.544049E+02	3.60173E+01	8.6549E-03	1.2263E-02	9.3331E-02	1.069E-02	3.498E-03
3.788588E+02	3.60154E+01	7.5812E-03	1.0048E-02	9.0595E-02	8.749E-03	3.273E-03
4.050001E+02	3.60138E+01	6.6408E-03	8.2338E-03	8.7931E-02	7.160E-03	3.061E-03
4.329451E+02	3.60123E+01	5.8172E-03	6.7471E-03	8.5335E-02	5.860E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 287

Rb Z = 37

Atomic weight = 8.546780E+01 g/mol, nominal density ρ (g/cm³) = 1.5290E+00

μ_0 (barns/atom) = μ (cm²/g) \times 1.41923E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.92353E+05

ν edges. Edge energies (keV):

K		1.51997E+00	L	I	2.06510E+00	L	II	1.86390E+00	L	III	1.80440E+00
M	I	3.22100E-00	M	II	2.47400E-00	M	III	2.38500E-00	M	IV	1.11800E-01
M	V	1.10300E-01									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.5194E-01, -1.5840E-01 e/atom

Nuclear Thomson correction f_{NT} = -8.7870E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.06052E+01	0.0000E+00	0.0000E+00	1.5427E-04	0.000E+00	1.160E+02
1.142761E-02	1.06015E+01	0.0000E+00	0.0000E+00	2.1002E-04	0.000E+00	1.085E+02
1.221612E-02	1.05972E+01	0.0000E+00	0.0000E+00	2.8438E-04	0.000E+00	1.015E+02
1.305903E-02	1.05923E+01	0.0000E+00	0.0000E+00	3.8304E-04	0.000E+00	9.494E+01
1.396010E-02	1.05867E+01	0.0000E+00	0.0000E+00	5.1319E-04	0.000E+00	8.881E+01
1.492335E-02	1.05803E+01	0.0000E+00	0.0000E+00	6.8398E-04	0.000E+00	8.308E+01
1.595306E-02	1.05730E+01	0.0000E+00	0.0000E+00	9.0686E-04	0.000E+00	7.772E+01
1.705382E-02	1.05646E+01	0.0000E+00	0.0000E+00	1.1962E-03	0.000E+00	7.270E+01
1.823053E-02	1.05550E+01	0.0000E+00	0.0000E+00	1.5696E-03	0.000E+00	6.801E+01
1.948844E-02	1.05440E+01	0.0000E+00	0.0000E+00	2.0492E-03	0.000E+00	6.362E+01
2.083314E-02	1.05314E+01	0.0000E+00	0.0000E+00	2.6617E-03	0.000E+00	5.951E+01
2.227063E-02	1.05170E+01	0.0000E+00	0.0000E+00	3.4398E-03	0.000E+00	5.567E+01
2.380730E-02	1.05004E+01	0.0000E+00	0.0000E+00	4.4231E-03	0.000E+00	5.208E+01
2.545001E-02	1.04814E+01	0.0000E+00	0.0000E+00	5.6593E-03	0.000E+00	4.872E+01
2.720606E-02	1.04596E+01	0.0000E+00	0.0000E+00	7.2050E-03	0.000E+00	4.557E+01
2.908327E-02	1.04345E+01	0.0000E+00	0.0000E+00	9.1280E-03	0.000E+00	4.263E+01
3.109002E-02	1.04057E+01	0.0000E+00	0.0000E+00	1.1508E-02	0.000E+00	3.988E+01
3.323523E-02	1.03726E+01	0.0000E+00	0.0000E+00	1.4437E-02	0.000E+00	3.731E+01
3.552846E-02	1.03345E+01	0.0000E+00	0.0000E+00	1.8026E-02	0.000E+00	3.490E+01
3.797993E-02	1.02905E+01	0.0000E+00	0.0000E+00	2.2398E-02	0.000E+00	3.264E+01
4.060054E-02	1.02397E+01	0.0000E+00	0.0000E+00	2.7699E-02	0.000E+00	3.054E+01
4.340198E-02	1.01809E+01	0.0000E+00	0.0000E+00	3.4093E-02	0.000E+00	2.857E+01
4.639671E-02	1.01128E+01	0.0000E+00	0.0000E+00	4.1766E-02	0.000E+00	2.672E+01
4.959809E-02	1.00337E+01	0.0000E+00	0.0000E+00	5.0927E-02	0.000E+00	2.500E+01
5.302035E-02	9.94164E+00	0.0000E+00	0.0000E+00	6.1811E-02	0.000E+00	2.338E+01
5.667876E-02	9.83403E+00	0.0000E+00	0.0000E+00	7.4677E-02	0.000E+00	2.187E+01
6.058959E-02	9.70781E+00	0.0000E+00	0.0000E+00	8.9810E-02	0.000E+00	2.046E+01
6.477028E-02	9.55905E+00	0.0000E+00	0.0000E+00	1.0752E-01	0.000E+00	1.914E+01
6.923942E-02	9.38267E+00	0.0000E+00	0.0000E+00	1.2814E-01	0.000E+00	1.791E+01
7.401695E-02	9.17195E+00	0.0000E+00	0.0000E+00	1.5204E-01	0.000E+00	1.675E+01
7.912411E-02	8.91774E+00	0.0000E+00	0.0000E+00	1.7960E-01	0.000E+00	1.567E+01
8.458368E-02	8.60695E+00	0.0000E+00	0.0000E+00	2.1121E-01	0.000E+00	1.466E+01
9.041995E-02	8.21972E+00	0.0000E+00	0.0000E+00	2.4731E-01	0.000E+00	1.371E+01
9.665893E-02	7.72246E+00	0.0000E+00	0.0000E+00	2.8832E-01	0.000E+00	1.283E+01
1.033284E-01	7.04466E+00	0.0000E+00	0.0000E+00	3.3469E-01	0.000E+00	1.200E+01
1.080940E-01	6.36832E+00	0.0000E+00	0.0000E+00	3.6928E-01	0.000E+00	1.147E+01
1.095640E-01	6.05004E+00	0.0000E+00	0.0000E+00	3.8018E-01	0.000E+00	1.132E+01
1.097485E-01	5.99430E+00	0.0000E+00	0.0000E+00	3.8156E-01	0.000E+00	1.130E+01
1.101897E-01	5.78032E+00	0.0000E+00	0.0000E+00	3.8485E-01	0.000E+00	1.125E+01
1.104581E-01	5.75275E+00	2.5914E-01	1.1551E+03	3.8686E-01	0.000E+00	1.122E+01
1.108515E-01	5.77037E+00	2.6970E-01	1.1979E+03	3.8981E-01	0.000E+00	1.118E+01
1.112410E-01	5.72118E+00	2.8054E-01	1.2417E+03	3.9274E-01	0.000E+00	1.115E+01
1.116882E-01	5.58945E+00	2.9347E-01	1.2937E+03	3.9611E-01	0.000E+00	1.110E+01
1.123590E-01	5.59619E+00	4.9693E-01	2.1775E+03	4.0118E-01	0.000E+00	1.103E+01
1.125060E-01	5.59062E+00	5.0427E-01	2.2068E+03	4.0230E-01	0.000E+00	1.102E+01
1.140360E-01	5.45079E+00	5.8678E-01	2.5334E+03	4.1396E-01	0.000E+00	1.087E+01
1.180797E-01	4.91265E+00	8.6744E-01	3.6169E+03	4.4526E-01	0.000E+00	1.050E+01
1.262272E-01	3.69986E+00	1.7961E+00	7.0056E+03	5.1033E-01	0.000E+00	9.822E+00
1.349368E-01	2.56355E+00	3.2757E+00	1.1952E+04	5.8246E-01	0.000E+00	9.188E+00
1.442475E-01	1.74687E+00	5.2741E+00	1.8002E+04	6.6204E-01	0.000E+00	8.595E+00
1.542005E-01	1.46669E+00	7.6481E+00	2.4420E+04	7.4940E-01	0.000E+00	8.040E+00
1.648404E-01	1.84424E+00	1.0163E+01	3.0356E+04	8.4483E-01	0.000E+00	7.521E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.762144E-01	2.87535E+00	1.2561E+01	3.5096E+04	9.4857E-01	0.000E+00	7.036E+00
1.883732E-01	4.44382E+00	1.4622E+01	3.8217E+04	1.0608E+00	0.000E+00	6.582E+00
2.013709E-01	6.35797E+00	1.6204E+01	3.9620E+04	1.1815E+00	0.000E+00	6.157E+00
2.152655E-01	8.37821E+00	1.7252E+01	3.9459E+04	1.3108E+00	0.000E+00	5.760E+00
2.301188E-01	1.01330E+01	1.7780E+01	3.8040E+04	1.4486E+00	0.000E+00	5.388E+00
2.337300E-01	1.03741E+01	1.7834E+01	3.7567E+04	1.4819E+00	0.000E+00	5.305E+00
2.373075E-01	1.02407E+01	1.7863E+01	3.7062E+04	1.5149E+00	0.000E+00	5.225E+00
2.382615E-01	9.69342E+00	1.7867E+01	3.6922E+04	1.5237E+00	0.000E+00	5.204E+00
2.396925E-01	1.04916E+01	1.9152E+01	3.9341E+04	1.5368E+00	0.000E+00	5.173E+00
2.424520E-01	1.12475E+01	1.9176E+01	3.8941E+04	1.5622E+00	0.000E+00	5.114E+00
2.432700E-01	1.13947E+01	1.9181E+01	3.8820E+04	1.5697E+00	0.000E+00	5.097E+00
2.459970E-01	1.17264E+01	1.9190E+01	3.8408E+04	1.5946E+00	0.000E+00	5.040E+00
2.461630E-01	1.17335E+01	1.9190E+01	3.8383E+04	1.5961E+00	0.000E+00	5.037E+00
2.471526E-01	1.16209E+01	1.9191E+01	3.8230E+04	1.6052E+00	0.000E+00	5.017E+00
2.486370E-01	1.21407E+01	1.9742E+01	3.9094E+04	1.6187E+00	0.000E+00	4.987E+00
2.523480E-01	1.29482E+01	1.9744E+01	3.8523E+04	1.6525E+00	0.000E+00	4.913E+00
2.629708E-01	1.45810E+01	1.9673E+01	3.6832E+04	1.7486E+00	0.000E+00	4.715E+00
2.811158E-01	1.67594E+01	1.9343E+01	3.3878E+04	1.9102E+00	0.000E+00	4.410E+00
3.005128E-01	1.85648E+01	1.8795E+01	3.0792E+04	2.0787E+00	0.000E+00	4.126E+00
3.156580E-01	1.95375E+01	1.8287E+01	2.8324E+04	2.2071E+00	0.000E+00	3.928E+00
3.204895E-01	1.95433E+01	1.8117E+01	2.7833E+04	2.2474E+00	0.000E+00	3.869E+00
3.212482E-01	1.94315E+01	1.8090E+01	2.7726E+04	2.2537E+00	0.000E+00	3.859E+00
3.217779E-01	1.92133E+01	1.8071E+01	2.7651E+04	2.2581E+00	0.000E+00	3.853E+00
3.237105E-01	1.97819E+01	1.8835E+01	2.8648E+04	2.2741E+00	0.000E+00	3.830E+00
3.285420E-01	2.04946E+01	1.8663E+01	2.7968E+04	2.3139E+00	0.000E+00	3.774E+00
3.434143E-01	2.17872E+01	1.8124E+01	2.5985E+04	2.4343E+00	0.000E+00	3.610E+00
3.671099E-01	2.32924E+01	1.7264E+01	2.3154E+04	2.6197E+00	0.000E+00	3.377E+00
3.924405E-01	2.45443E+01	1.6369E+01	2.0536E+04	2.8089E+00	0.000E+00	3.159E+00
4.195189E-01	2.56094E+01	1.5460E+01	1.8144E+04	3.0009E+00	0.000E+00	2.955E+00
4.484657E-01	2.65213E+01	1.4553E+01	1.5977E+04	3.1945E+00	0.000E+00	2.765E+00
4.794098E-01	2.73013E+01	1.3654E+01	1.4023E+04	3.3885E+00	0.000E+00	2.586E+00
5.124891E-01	2.79617E+01	1.2771E+01	1.2269E+04	3.5815E+00	0.000E+00	2.419E+00
5.478508E-01	2.85146E+01	1.1912E+01	1.0705E+04	3.7724E+00	0.000E+00	2.263E+00
5.856525E-01	2.89716E+01	1.1084E+01	9.3182E+03	3.9597E+00	0.000E+00	2.117E+00
6.260625E-01	2.93430E+01	1.0291E+01	8.0933E+03	4.1421E+00	0.000E+00	1.980E+00
6.692609E-01	2.96376E+01	9.5364E+00	7.0156E+03	4.3181E+00	0.000E+00	1.853E+00
7.154399E-01	2.98635E+01	8.8212E+00	6.0706E+03	4.4865E+00	0.000E+00	1.733E+00
7.648052E-01	3.00328E+01	8.1467E+00	5.2445E+03	4.6460E+00	0.000E+00	1.621E+00
8.175768E-01	3.01412E+01	7.5128E+00	4.5243E+03	4.7953E+00	0.000E+00	1.516E+00
8.739896E-01	3.01985E+01	6.9191E+00	3.8978E+03	4.9332E+00	0.000E+00	1.419E+00
9.342948E-01	3.02095E+01	6.3649E+00	3.3541E+03	5.0587E+00	0.000E+00	1.327E+00
9.987612E-01	3.01813E+01	5.8487E+00	2.8832E+03	5.1709E+00	0.000E+00	1.241E+00
1.067676E+00	3.00924E+01	5.2591E+00	2.4252E+03	5.2688E+00	0.000E+00	1.161E+00
1.141345E+00	2.98858E+01	4.7337E+00	2.0420E+03	5.3517E+00	0.000E+00	1.086E+00
1.220098E+00	2.95799E+01	4.2670E+00	1.7219E+03	5.4191E+00	0.000E+00	1.016E+00
1.304285E+00	2.91656E+01	3.8509E+00	1.4537E+03	5.4706E+00	0.000E+00	9.506E-01
1.394281E+00	2.86048E+01	3.4763E+00	1.2276E+03	5.5058E+00	0.000E+00	8.892E-01
1.490486E+00	2.78159E+01	3.1425E+00	1.0381E+03	5.5247E+00	0.000E+00	8.318E-01
1.593329E+00	2.66003E+01	2.8447E+00	8.7902E+02	5.5272E+00	0.000E+00	7.781E-01
1.703269E+00	2.42705E+01	2.5786E+00	7.4538E+02	5.5136E+00	0.000E+00	7.279E-01
1.768312E+00	2.09998E+01	2.4416E+00	6.7983E+02	5.4989E+00	0.000E+00	7.011E-01
1.795378E+00	1.67689E+01	2.3885E+00	6.5501E+02	5.4915E+00	0.000E+00	6.906E-01
1.802596E+00	1.20146E+01	2.3747E+00	6.4862E+02	5.4895E+00	0.000E+00	6.878E-01
1.813422E+00	1.65024E+01	1.1451E+01	3.1091E+03	5.4863E+00	0.000E+00	6.837E-01
1.820795E+00	1.81208E+01	1.1348E+01	3.0687E+03	5.4840E+00	0.000E+00	6.809E-01
1.826622E+00	1.88680E+01	1.1268E+01	3.0373E+03	5.4822E+00	0.000E+00	6.788E-01
1.840488E+00	1.97523E+01	1.1081E+01	2.9642E+03	5.4778E+00	0.000E+00	6.736E-01
1.854580E+00	1.95105E+01	1.0895E+01	2.8923E+03	5.4731E+00	0.000E+00	6.685E-01
1.862036E+00	1.76613E+01	1.0798E+01	2.8552E+03	5.4706E+00	0.000E+00	6.659E-01
1.873219E+00	2.05312E+01	1.5142E+01	3.9798E+03	5.4667E+00	0.000E+00	6.619E-01
1.901178E+00	2.36161E+01	1.4663E+01	3.7973E+03	5.4566E+00	0.000E+00	6.521E-01
1.946430E+00	2.58435E+01	1.4007E+01	3.5432E+03	5.4391E+00	0.000E+00	6.370E-01
2.023798E+00	2.75287E+01	1.3090E+01	3.1846E+03	5.4059E+00	0.000E+00	6.126E-01
2.054774E+00	2.73506E+01	1.2769E+01	3.0598E+03	5.3916E+00	0.000E+00	6.034E-01
2.063035E+00	2.65310E+01	1.2687E+01	3.0279E+03	5.3877E+00	0.000E+00	6.010E-01

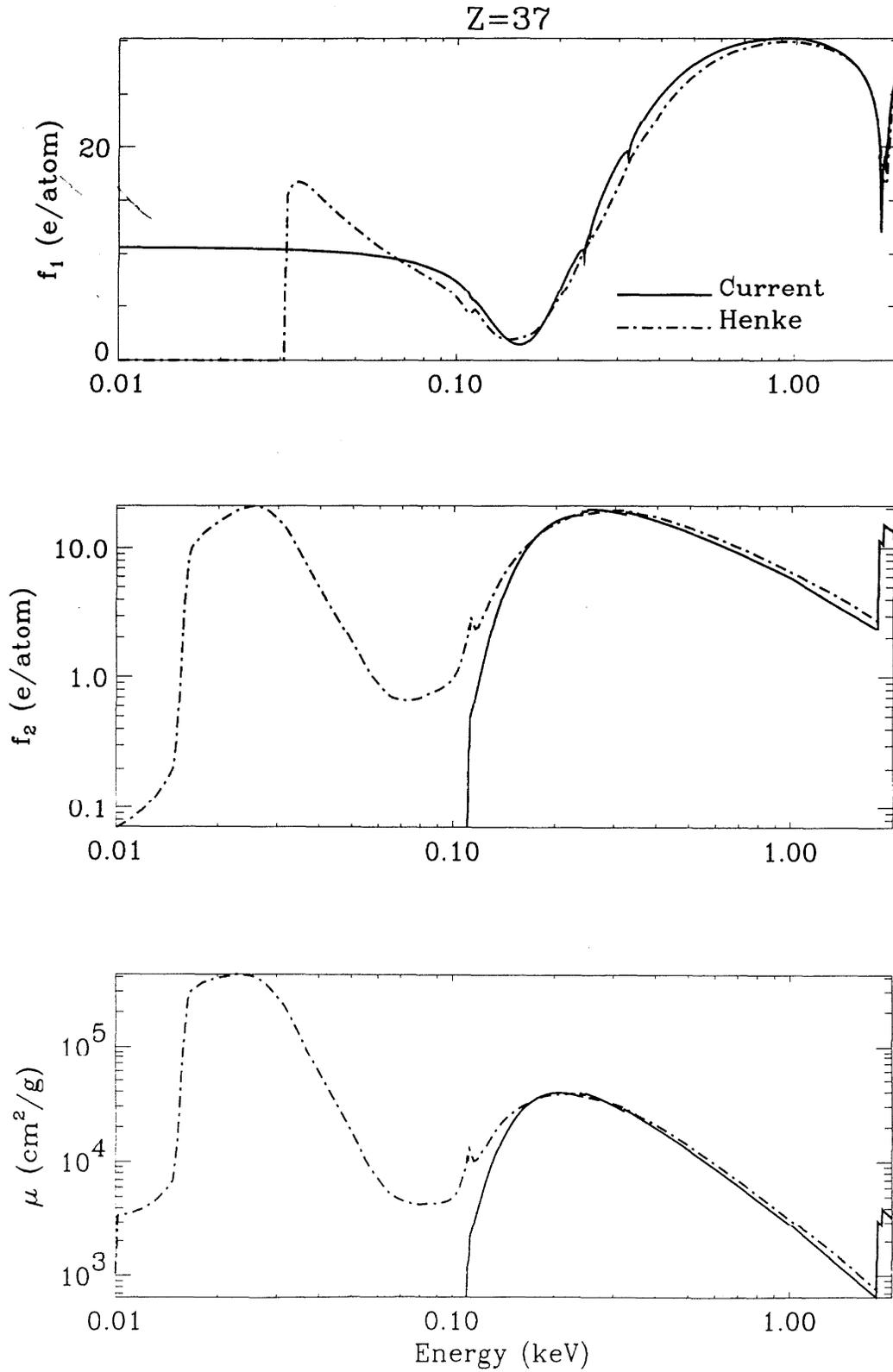
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 289

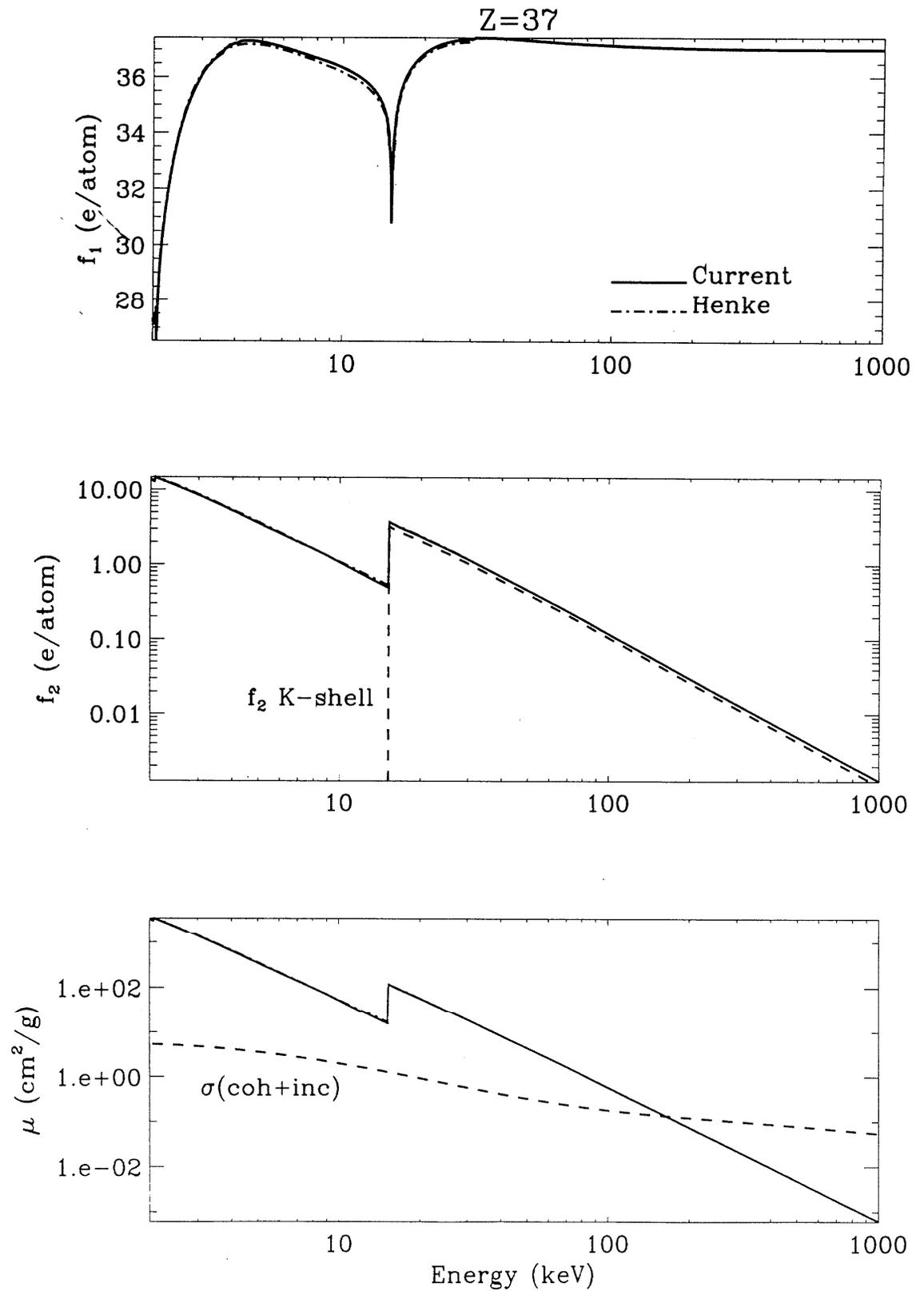
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.075425E+00	2.77221E+01	1.4480E+01	3.4350E+03	5.3818E+00	0.000E+00	5.974E-01
2.080733E+00	2.80720E+01	1.4424E+01	3.4130E+03	5.3792E+00	0.000E+00	5.959E-01
2.106402E+00	2.90967E+01	1.4161E+01	3.3101E+03	5.3667E+00	0.000E+00	5.886E-01
2.224304E+00	3.14076E+01	1.3092E+01	2.8979E+03	5.3052E+00	0.000E+00	5.574E-01
2.377781E+00	3.31215E+01	1.1929E+01	2.4700E+03	5.2179E+00	0.000E+00	5.214E-01
2.541848E+00	3.43107E+01	1.0816E+01	2.0950E+03	5.1180E+00	0.000E+00	4.878E-01
2.717235E+00	3.51644E+01	9.7911E+00	1.7741E+03	5.0066E+00	0.000E+00	4.563E-01
2.904724E+00	3.57995E+01	8.8531E+00	1.5006E+03	4.8847E+00	0.000E+00	4.268E-01
3.105150E+00	3.62964E+01	7.9746E+00	1.2645E+03	4.7534E+00	0.000E+00	3.993E-01
3.319406E+00	3.66150E+01	7.1601E+00	1.0620E+03	4.6137E+00	0.000E+00	3.735E-01
3.548445E+00	3.68409E+01	6.4342E+00	8.9276E+02	4.4669E+00	0.000E+00	3.494E-01
3.793288E+00	3.71467E+01	5.7579E+00	7.4735E+02	4.3139E+00	0.000E+00	3.269E-01
4.055024E+00	3.72307E+01	5.1392E+00	6.2399E+02	4.1560E+00	0.000E+00	3.058E-01
4.334821E+00	3.73083E+01	4.5792E+00	5.2011E+02	3.9943E+00	0.000E+00	2.860E-01
4.633924E+00	3.73012E+01	4.0776E+00	4.3324E+02	3.8298E+00	0.000E+00	2.676E-01
4.953664E+00	3.72647E+01	3.6308E+00	3.6087E+02	3.6636E+00	0.000E+00	2.503E-01
5.295467E+00	3.72079E+01	3.2358E+00	3.0085E+02	3.4966E+00	0.000E+00	2.341E-01
5.660855E+00	3.71377E+01	2.8864E+00	2.5104E+02	3.3299E+00	0.000E+00	2.190E-01
6.051453E+00	3.70586E+01	2.5770E+00	2.0967E+02	3.1642E+00	0.000E+00	2.049E-01
6.469004E+00	3.69737E+01	2.3017E+00	1.7518E+02	3.0004E+00	0.000E+00	1.917E-01
6.915365E+00	3.68848E+01	2.0576E+00	1.4650E+02	2.8391E+00	0.000E+00	1.793E-01
7.392525E+00	3.67938E+01	1.8411E+00	1.2262E+02	2.6812E+00	0.000E+00	1.677E-01
7.902609E+00	3.67023E+01	1.6480E+00	1.0267E+02	2.5271E+00	0.000E+00	1.569E-01
8.447890E+00	3.66083E+01	1.4703E+00	8.5691E+01	2.3773E+00	0.000E+00	1.468E-01
9.030794E+00	3.65147E+01	1.3082E+00	7.1320E+01	2.2324E+00	0.000E+00	1.373E-01
9.653919E+00	3.64009E+01	1.1491E+00	5.8603E+01	2.0926E+00	0.000E+00	1.284E-01
1.032004E+01	3.62685E+01	1.0103E+00	4.8201E+01	1.9582E+00	0.000E+00	1.201E-01
1.103212E+01	3.61154E+01	8.8918E-01	3.9683E+01	1.8296E+00	0.000E+00	1.124E-01
1.179334E+01	3.59319E+01	7.8333E-01	3.2703E+01	1.7068E+00	0.000E+00	1.051E-01
1.260708E+01	3.56954E+01	6.9075E-01	2.6976E+01	1.5900E+00	0.000E+00	9.834E-02
1.347697E+01	3.53489E+01	6.0970E-01	2.2274E+01	1.4791E+00	0.000E+00	9.200E-02
1.440688E+01	3.46753E+01	5.3867E-01	1.8409E+01	1.3743E+00	0.000E+00	8.606E-02
1.489571E+01	3.37901E+01	5.0650E-01	1.6742E+01	1.3242E+00	0.000E+00	8.323E-02
1.512370E+01	3.24280E+01	4.9254E-01	1.6035E+01	1.3018E+00	0.000E+00	8.198E-02
1.518450E+01	3.07845E+01	4.8892E-01	1.5853E+01	1.2960E+00	0.000E+00	8.165E-02
1.527570E+01	3.24638E+01	3.7245E+00	1.2004E+01	1.2873E+00	1.045E+02	8.116E-02
1.540095E+01	3.35245E+01	3.6643E+00	1.1714E+02	1.2755E+00	1.019E+02	8.050E-02
1.550369E+01	3.39820E+01	3.6159E+00	1.1483E+02	1.2660E+00	9.989E+01	7.997E-02
1.646362E+01	3.55543E+01	3.2333E+00	9.6694E+01	1.1826E+00	8.408E+01	7.531E-02
1.759961E+01	3.62184E+01	2.8978E+00	8.1066E+01	1.0955E+00	7.061E+01	7.045E-02
1.881398E+01	3.66050E+01	2.6097E+00	6.8293E+01	1.0140E+00	5.962E+01	6.590E-02
2.011215E+01	3.68702E+01	2.3484E+00	5.7490E+01	9.3799E-01	5.029E+01	6.165E-02
2.149988E+01	3.70520E+01	2.1007E+00	4.8106E+01	8.6725E-01	4.212E+01	5.767E-02
2.298338E+01	3.71762E+01	1.8765E+00	4.0198E+01	8.0158E-01	3.522E+01	5.395E-02
2.456923E+01	3.72613E+01	1.6749E+00	3.3564E+01	7.4076E-01	2.942E+01	5.046E-02
2.626450E+01	3.73198E+01	1.4947E+00	2.8020E+01	6.8455E-01	2.457E+01	4.721E-02
2.807676E+01	3.73592E+01	1.3296E+00	2.3316E+01	6.3272E-01	2.047E+01	4.416E-02
3.001405E+01	3.73806E+01	1.1815E+00	1.9381E+01	5.8501E-01	1.704E+01	4.131E-02
3.208502E+01	3.74248E+01	1.0446E+00	1.6029E+01	5.4119E-01	1.411E+01	3.864E-02
3.429889E+01	3.74215E+01	9.2254E-01	1.3243E+01	5.0102E-01	1.166E+01	3.615E-02
3.666551E+01	3.74110E+01	8.1482E-01	1.0942E+01	4.6424E-01	9.639E+00	3.381E-02
3.919543E+01	3.73958E+01	7.1970E-01	9.0405E+00	4.3064E-01	7.967E+00	3.163E-02
4.189992E+01	3.73776E+01	6.3565E-01	7.4694E+00	3.9997E-01	6.586E+00	2.959E-02
4.479101E+01	3.73576E+01	5.6136E-01	6.1706E+00	3.7202E-01	5.444E+00	2.768E-02
4.788159E+01	3.73367E+01	4.9552E-01	5.0953E+00	3.4659E-01	4.500E+00	2.589E-02
5.118542E+01	3.73153E+01	4.3743E-01	4.2076E+00	3.2346E-01	3.720E+00	2.422E-02
5.471721E+01	3.72942E+01	3.8618E-01	3.4749E+00	3.0244E-01	3.075E+00	2.266E-02
5.849270E+01	3.72736E+01	3.4095E-01	2.8699E+00	2.8335E-01	2.542E+00	2.120E-02
6.252870E+01	3.72538E+01	3.0104E-01	2.3704E+00	2.6603E-01	2.101E+00	1.983E-02
6.684318E+01	3.72352E+01	2.6552E-01	1.9558E+00	2.5031E-01	1.734E+00	1.855E-02
7.145536E+01	3.72171E+01	2.3329E-01	1.6074E+00	2.3604E-01	1.426E+00	1.735E-02
7.638578E+01	3.71997E+01	2.0497E-01	1.3212E+00	2.2308E-01	1.172E+00	1.623E-02
8.165640E+01	3.71841E+01	1.7991E-01	1.0848E+00	2.1130E-01	9.619E-01	1.518E-02
8.729069E+01	3.71686E+01	1.5755E-01	8.8866E-01	2.0058E-01	7.877E-01	1.420E-02
9.331374E+01	3.71539E+01	1.3798E-01	7.2801E-01	1.9082E-01	6.451E-01	1.329E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
9.975239E+01	3.71401E+01	1.2084E-01	5.9643E-01	1.8192E-01	5.283E-01	1.243E-02
1.066353E+02	3.71273E+01	1.0583E-01	4.8865E-01	1.7377E-01	4.326E-01	1.163E-02
1.139931E+02	3.71155E+01	9.2695E-02	4.0036E-01	1.6630E-01	3.543E-01	1.088E-02
1.218587E+02	3.71046E+01	8.1191E-02	3.2804E-01	1.5943E-01	2.901E-01	1.017E-02
1.302669E+02	3.70947E+01	7.1118E-02	2.6879E-01	1.5310E-01	2.376E-01	9.518E-03
1.392553E+02	3.70855E+01	6.2296E-02	2.2026E-01	1.4724E-01	1.946E-01	8.903E-03
1.488640E+02	3.70772E+01	5.4571E-02	1.8049E-01	1.4180E-01	1.593E-01	8.329E-03
1.591356E+02	3.70696E+01	4.7806E-02	1.4791E-01	1.3672E-01	1.305E-01	7.791E-03
1.701159E+02	3.70627E+01	4.1881E-02	1.2121E-01	1.3197E-01	1.069E-01	7.288E-03
1.818539E+02	3.70565E+01	3.6691E-02	9.9338E-02	1.2750E-01	8.752E-02	6.818E-03
1.944018E+02	3.70508E+01	3.2146E-02	8.1414E-02	1.2328E-01	7.167E-02	6.378E-03
2.078156E+02	3.70456E+01	2.8164E-02	6.6726E-02	1.1928E-01	5.869E-02	5.966E-03
2.221548E+02	3.70410E+01	2.4677E-02	5.4690E-02	1.1547E-01	4.806E-02	5.581E-03
2.374835E+02	3.70368E+01	2.1622E-02	4.4826E-02	1.1183E-01	3.936E-02	5.221E-03
2.538699E+02	3.70330E+01	1.8946E-02	3.6743E-02	1.0834E-01	3.223E-02	4.884E-03
2.713869E+02	3.70296E+01	1.6601E-02	3.0118E-02	1.0499E-01	2.640E-02	4.569E-03
2.901126E+02	3.70265E+01	1.4547E-02	2.4688E-02	1.0173E-01	2.162E-02	4.274E-03
3.101304E+02	3.70237E+01	1.2748E-02	2.0238E-02	9.8609E-02	1.770E-02	3.998E-03
3.315294E+02	3.70212E+01	1.1171E-02	1.6590E-02	9.5566E-02	1.450E-02	3.740E-03
3.544049E+02	3.70190E+01	9.7899E-03	1.3600E-02	9.2606E-02	1.187E-02	3.498E-03
3.788588E+02	3.70170E+01	8.5796E-03	1.1150E-02	8.9774E-02	9.723E-03	3.273E-03
4.050001E+02	3.70152E+01	7.5192E-03	9.1410E-03	8.6911E-02	7.962E-03	3.061E-03
4.329451E+02	3.70135E+01	6.5900E-03	7.4943E-03	8.4163E-02	6.521E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 293

Sr Z = 38

Atomic weight = 8.762000E+01 g/mol, nominal density ρ (g/cm³) = 2.5400E+00

μ_0 (barns/atom) = μ (cm²/g) \times 1.45497E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.80259E+05

12 edges. Edge energies (keV):

K 1.61046E+00 L I 2.21630E+00 L II 2.00680E+00 L III 1.93960E+00
M I 3.57500E-00 M II 2.79800E-00 M III 2.69100E-00 M IV 1.35000E-01
M V 1.33100E-00 N I 3.77000E-02 N II 1.99000E-02 N III 1.99000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.6890E-01, -1.6920E-01 e/atom

Nuclear Thomson correction f_{NT} = -9.0407E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	6.01475E+00	0.0000E+00	0.0000E+00	1.2263E-04	0.000E+00	1.160E+02
1.142761E-02	5.84877E+00	0.0000E+00	0.0000E+00	1.6787E-04	0.000E+00	1.085E+02
1.221612E-02	5.64098E+00	0.0000E+00	0.0000E+00	2.2856E-04	0.000E+00	1.015E+02
1.305903E-02	5.37550E+00	0.0000E+00	0.0000E+00	3.0953E-04	0.000E+00	9.494E+01
1.396010E-02	5.02694E+00	0.0000E+00	0.0000E+00	4.1694E-04	0.000E+00	8.881E+01
1.492335E-02	4.55166E+00	0.0000E+00	0.0000E+00	5.5864E-04	0.000E+00	8.308E+01
1.595306E-02	3.86641E+00	0.0000E+00	0.0000E+00	7.4456E-04	0.000E+00	7.772E+01
1.705382E-02	2.78500E+00	0.0000E+00	0.0000E+00	9.8715E-04	0.000E+00	7.270E+01
1.823053E-02	7.54046E-01	0.0000E+00	0.0000E+00	1.3020E-03	0.000E+00	6.801E+01
1.948844E-02	-5.82671E+00	0.0000E+00	0.0000E+00	1.7083E-03	0.000E+00	6.362E+01
1.950200E-02	-6.00105E+00	0.0000E+00	0.0000E+00	1.7131E-03	0.000E+00	6.358E+01
1.980050E-02	-1.36341E+01	0.0000E+00	0.0000E+00	1.8210E-03	0.000E+00	6.262E+01
1.988010E-02	-2.30666E+01	0.0000E+00	0.0000E+00	1.8505E-03	0.000E+00	6.237E+01
1.999950E-02	-1.28619E+01	1.8720E+01	4.4953E+05	1.8955E-03	0.000E+00	6.199E+01
2.029800E-02	-3.82214E+00	1.7971E+01	4.2520E+05	2.0110E-03	0.000E+00	6.108E+01
2.083314E-02	2.01263E+00	1.6728E+01	3.8563E+05	2.2298E-03	0.000E+00	5.951E+01
2.227063E-02	8.40831E+00	1.3904E+01	2.9984E+05	2.8958E-03	0.000E+00	5.567E+01
2.380730E-02	1.14841E+01	1.1221E+01	2.2637E+05	3.7415E-03	0.000E+00	5.208E+01
2.545001E-02	1.29978E+01	8.7811E+00	1.6571E+05	4.8098E-03	0.000E+00	4.872E+01
2.720606E-02	1.36030E+01	6.7384E+00	1.1895E+05	6.1521E-03	0.000E+00	4.557E+01
2.908327E-02	1.36861E+01	5.1194E+00	8.4538E+04	7.8298E-03	0.000E+00	4.263E+01
3.109002E-02	1.34888E+01	3.8813E+00	5.9956E+04	9.9157E-03	0.000E+00	3.988E+01
3.323523E-02	1.31574E+01	2.9556E+00	4.2709E+04	1.2495E-02	0.000E+00	3.731E+01
3.552846E-02	1.27730E+01	2.2723E+00	3.0716E+04	1.5669E-02	0.000E+00	3.490E+01
3.694600E-02	1.25346E+01	1.9596E+00	2.5473E+04	1.7853E-02	0.000E+00	3.356E+01
3.751150E-02	1.24291E+01	1.8527E+00	2.3721E+04	1.8772E-02	0.000E+00	3.305E+01
3.766230E-02	1.23844E+01	1.8257E+00	2.3281E+04	1.9022E-02	0.000E+00	3.292E+01
3.788850E-02	1.23712E+01	1.8292E+00	2.3186E+04	1.9400E-02	0.000E+00	3.272E+01
3.797993E-02	1.23628E+01	1.8141E+00	2.2940E+04	1.9554E-02	0.000E+00	3.264E+01
3.845400E-02	1.23062E+01	1.7391E+00	2.1720E+04	2.0365E-02	0.000E+00	3.224E+01
4.060054E-02	1.20320E+01	1.4601E+00	1.7271E+04	2.4285E-02	0.000E+00	3.054E+01
4.340198E-02	1.17120E+01	1.2070E+00	1.3356E+04	3.0015E-02	0.000E+00	2.857E+01
4.639671E-02	1.14213E+01	1.0266E+00	1.0626E+04	3.6921E-02	0.000E+00	2.672E+01
4.959809E-02	1.11581E+01	8.9863E-01	8.7014E+03	4.5201E-02	0.000E+00	2.500E+01
5.302035E-02	1.09182E+01	8.0874E-01	7.3255E+03	5.5079E-02	0.000E+00	2.338E+01
5.667876E-02	1.06961E+01	7.4641E-01	6.3246E+03	6.6803E-02	0.000E+00	2.187E+01
6.058959E-02	1.04934E+01	7.0405E-01	5.5806E+03	8.0647E-02	0.000E+00	2.046E+01
6.47028E-02	1.02891E+01	6.7615E-01	5.0135E+03	9.6914E-02	0.000E+00	1.914E+01
6.923942E-02	1.00843E+01	6.5872E-01	4.5690E+03	1.1593E-01	0.000E+00	1.791E+01
7.401695E-02	9.87222E+00	6.4890E-01	4.2104E+03	1.3805E-01	0.000E+00	1.675E+01
7.912411E-02	9.64530E+00	6.4464E-01	3.9128E+03	1.6365E-01	0.000E+00	1.567E+01
8.458368E-02	9.39477E+00	6.4464E-01	3.6602E+03	1.9314E-01	0.000E+00	1.466E+01
9.041995E-02	9.11006E+00	6.4796E-01	3.4416E+03	2.2692E-01	0.000E+00	1.371E+01
9.665893E-02	8.77712E+00	6.5373E-01	3.2481E+03	2.6545E-01	0.000E+00	1.283E+01
1.033284E-01	8.37592E+00	6.6129E-01	3.0736E+03	3.0916E-01	0.000E+00	1.200E+01
1.104581E-01	7.87523E+00	6.7015E-01	2.9137E+03	3.5851E-01	0.000E+00	1.122E+01
1.180797E-01	7.21893E+00	6.7994E-01	2.7655E+03	4.1395E-01	0.000E+00	1.050E+01
1.262272E-01	6.26992E+00	6.9034E-01	2.6265E+03	4.7593E-01	0.000E+00	9.822E+00
1.304380E-01	5.54051E+00	6.9558E-01	2.5611E+03	5.0894E-01	0.000E+00	9.505E+00
1.323000E-01	5.01232E+00	6.9786E-01	2.5333E+03	5.2373E-01	0.000E+00	9.371E+00
1.324345E-01	4.95426E+00	6.9802E-01	2.5313E+03	5.2480E-01	0.000E+00	9.362E+00
1.329669E-01	4.56862E+00	6.9867E-01	2.5235E+03	5.2905E-01	0.000E+00	9.324E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{x} cm ² /g	λ nm
1.337655E-01	4.63112E+00	1.2472E+00	4.4777E+03	5.3545E-01	0.000E+00	9.269E+00
1.343250E-01	4.56576E+00	1.2706E+00	4.5429E+03	5.3994E-01	0.000E+00	9.230E+00
1.349368E-01	4.25375E+00	1.2972E+00	4.6169E+03	5.4487E-01	0.000E+00	9.188E+00
1.356750E-01	4.44240E+00	1.7037E+00	6.0307E+03	5.5083E-01	0.000E+00	9.138E+00
1.357620E-01	4.44650E+00	1.7101E+00	6.0494E+03	5.5153E-01	0.000E+00	9.132E+00
1.377000E-01	4.35558E+00	1.8615E+00	6.4924E+03	5.6725E-01	0.000E+00	9.004E+00
1.442475E-01	3.59201E+00	2.5308E+00	8.4259E+03	6.2117E-01	0.000E+00	8.595E+00
1.542005E-01	2.40039E+00	4.0874E+00	1.2730E+04	7.0522E-01	0.000E+00	8.040E+00
1.648404E-01	1.56073E+00	6.2297E+00	1.8150E+04	7.9732E-01	0.000E+00	7.521E+00
1.762144E-01	1.31547E+00	8.7792E+00	2.3927E+04	8.9775E-01	0.000E+00	7.036E+00
1.883732E-01	1.79924E+00	1.1466E+01	2.9232E+04	1.0067E+00	0.000E+00	6.582E+00
2.013709E-01	2.99766E+00	1.3995E+01	3.3377E+04	1.1244E+00	0.000E+00	6.157E+00
2.152655E-01	4.76573E+00	1.6122E+01	3.5969E+04	1.2507E+00	0.000E+00	5.760E+00
2.301188E-01	6.87259E+00	1.7700E+01	3.6940E+04	1.3858E+00	0.000E+00	5.388E+00
2.459970E-01	9.02751E+00	1.8678E+01	3.6464E+04	1.5294E+00	0.000E+00	5.040E+00
2.629708E-01	1.06739E+01	1.9087E+01	3.4858E+04	1.6813E+00	0.000E+00	4.715E+00
2.637180E-01	1.06994E+01	1.9093E+01	3.4770E+04	1.6879E+00	0.000E+00	4.701E+00
2.677545E-01	1.04677E+01	1.9110E+01	3.4276E+04	1.7237E+00	0.000E+00	4.631E+00
2.688309E-01	9.77365E+00	1.9110E+01	3.4140E+04	1.7332E+00	0.000E+00	4.612E+00
2.704455E-01	1.07411E+01	2.0693E+01	3.6746E+04	1.7475E+00	0.000E+00	4.584E+00
2.742040E-01	1.17583E+01	2.0703E+01	3.6261E+04	1.7806E+00	0.000E+00	4.522E+00
2.744820E-01	1.18076E+01	2.0703E+01	3.6224E+04	1.7830E+00	0.000E+00	4.517E+00
2.784010E-01	1.22586E+01	2.0694E+01	3.5699E+04	1.8174E+00	0.000E+00	4.453E+00
2.795202E-01	1.20944E+01	2.0688E+01	3.5546E+04	1.8271E+00	0.000E+00	4.436E+00
2.811158E-01	1.26846E+01	2.1367E+01	3.6503E+04	1.8411E+00	0.000E+00	4.410E+00
2.811990E-01	1.27109E+01	2.1367E+01	3.6492E+04	1.8418E+00	0.000E+00	4.409E+00
2.853960E-01	1.36391E+01	2.1343E+01	3.5915E+04	1.8783E+00	0.000E+00	4.344E+00
3.005128E-01	1.58617E+01	2.1135E+01	3.3776E+04	2.0083E+00	0.000E+00	4.126E+00
3.212482E-01	1.81526E+01	2.0620E+01	3.0827E+04	2.1825E+00	0.000E+00	3.859E+00
3.434143E-01	1.99592E+01	1.9892E+01	2.7819E+04	2.3627E+00	0.000E+00	3.610E+00
3.503500E-01	2.03353E+01	1.9644E+01	2.6928E+04	2.4178E+00	0.000E+00	3.539E+00
3.557125E-01	2.03684E+01	1.9448E+01	2.6257E+04	2.4600E+00	0.000E+00	3.486E+00
3.571425E-01	2.00386E+01	1.9395E+01	2.6081E+04	2.4712E+00	0.000E+00	3.472E+00
3.592875E-01	2.06284E+01	2.0165E+01	2.6955E+04	2.4879E+00	0.000E+00	3.451E+00
3.646500E-01	2.13786E+01	1.9968E+01	2.6298E+04	2.5294E+00	0.000E+00	3.400E+00
3.671099E-01	2.16251E+01	1.9876E+01	2.6003E+04	2.5483E+00	0.000E+00	3.377E+00
3.924405E-01	2.34986E+01	1.8928E+01	2.3163E+04	2.7383E+00	0.000E+00	3.159E+00
4.195189E-01	2.49534E+01	1.7932E+01	2.0528E+04	2.9317E+00	0.000E+00	2.955E+00
4.484657E-01	2.61751E+01	1.6918E+01	1.8117E+04	3.1273E+00	0.000E+00	2.765E+00
4.794098E-01	2.72060E+01	1.5907E+01	1.5935E+04	3.3239E+00	0.000E+00	2.586E+00
5.124891E-01	2.80783E+01	1.4913E+01	1.3976E+04	3.5202E+00	0.000E+00	2.419E+00
5.478508E-01	2.88164E+01	1.3946E+01	1.2226E+04	3.7150E+00	0.000E+00	2.263E+00
5.856525E-01	2.94368E+01	1.3007E+01	1.0667E+04	3.9067E+00	0.000E+00	2.117E+00
6.260625E-01	2.99511E+01	1.2102E+01	9.2838E+03	4.0941E+00	0.000E+00	1.980E+00
6.92609E-01	3.03708E+01	1.1236E+01	8.0631E+03	4.2758E+00	0.000E+00	1.853E+00
7.154399E-01	3.07066E+01	1.0413E+01	6.9898E+03	4.4502E+00	0.000E+00	1.733E+00
7.648052E-01	3.09681E+01	9.6331E+00	6.0491E+03	4.6162E+00	0.000E+00	1.621E+00
8.175768E-01	3.11690E+01	8.8989E+00	5.2274E+03	4.7723E+00	0.000E+00	1.516E+00
8.739896E-01	3.13124E+01	8.2102E+00	4.5115E+03	4.9174E+00	0.000E+00	1.419E+00
9.342948E-01	3.14130E+01	7.5663E+00	3.8894E+03	5.0503E+00	0.000E+00	1.327E+00
9.987612E-01	3.15546E+01	6.9663E+00	3.3498E+03	5.1701E+00	0.000E+00	1.241E+00
1.067676E+00	3.15036E+01	6.3301E+00	2.8474E+03	5.2756E+00	0.000E+00	1.161E+00
1.141345E+00	3.13758E+01	5.7183E+00	2.4062E+03	5.3663E+00	0.000E+00	1.086E+00
1.220098E+00	3.11577E+01	5.1566E+00	2.0298E+03	5.4414E+00	0.000E+00	1.016E+00
1.304285E+00	3.08513E+01	4.6569E+00	1.7147E+03	5.5004E+00	0.000E+00	9.506E-01
1.394281E+00	3.04446E+01	4.2117E+00	1.4507E+03	5.5430E+00	0.000E+00	8.892E-01
1.490486E+00	2.99032E+01	3.8117E+00	1.2282E+03	5.5690E+00	0.000E+00	8.318E-01
1.593329E+00	2.91497E+01	3.4528E+00	1.0407E+03	5.5782E+00	0.000E+00	7.781E-01
1.703269E+00	2.80062E+01	3.1320E+00	8.8310E+02	5.5710E+00	0.000E+00	7.279E-01
1.820795E+00	2.58874E+01	2.8448E+00	7.5036E+02	5.5474E+00	0.000E+00	6.809E-01
1.900808E+00	2.24478E+01	2.6757E+00	6.7605E+02	5.5237E+00	0.000E+00	6.523E-01
1.929902E+00	1.83841E+01	2.6188E+00	6.5169E+02	5.5138E+00	0.000E+00	6.424E-01
1.937660E+00	1.38390E+01	2.6040E+00	6.4541E+02	5.5111E+00	0.000E+00	6.399E-01
1.946430E+00	1.71473E+01	1.1304E+01	2.7890E+03	5.5079E+00	0.000E+00	6.370E-01
1.949298E+00	1.80907E+01	1.1275E+01	2.7778E+03	5.5068E+00	0.000E+00	6.360E-01

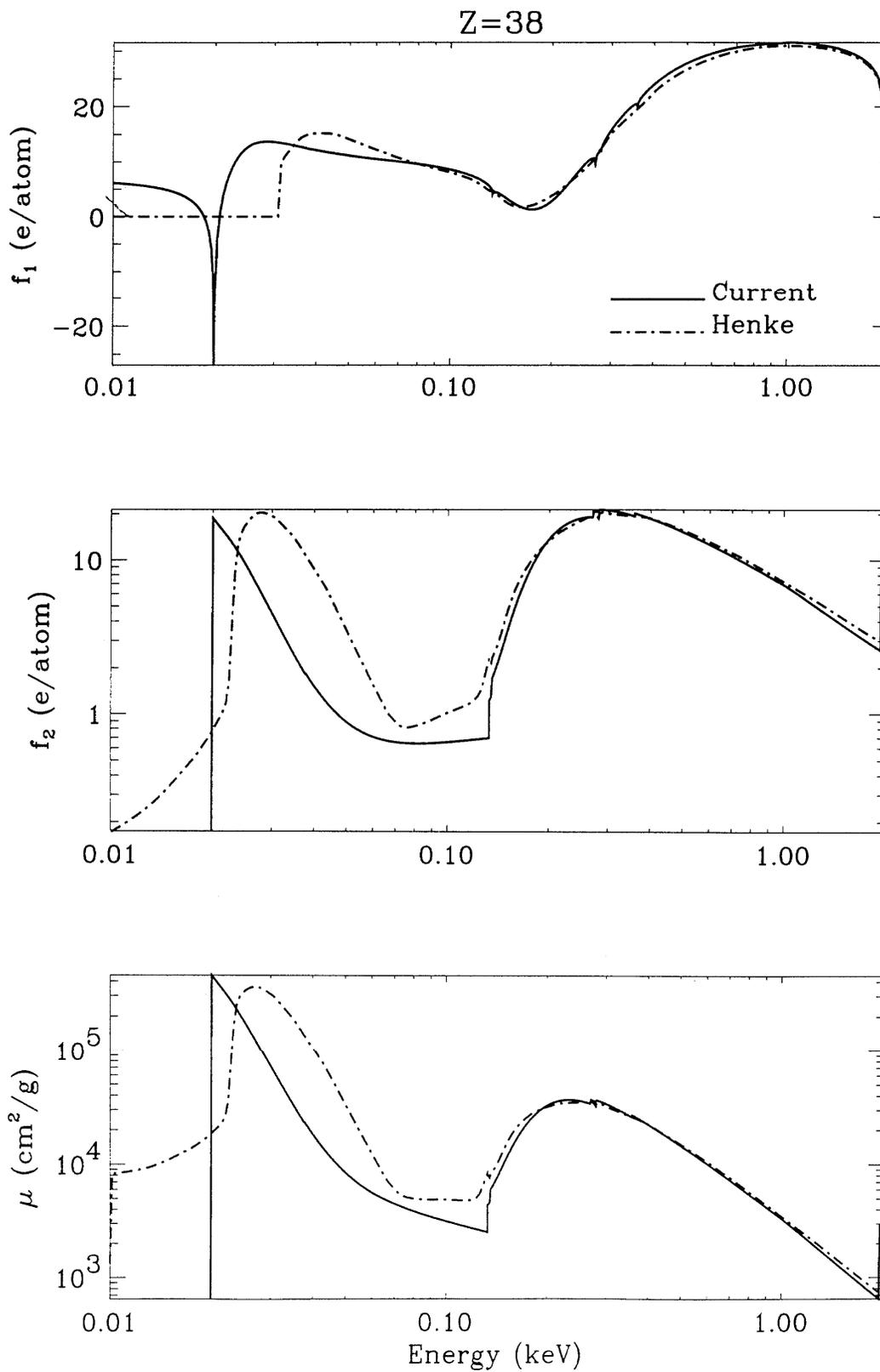
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 295

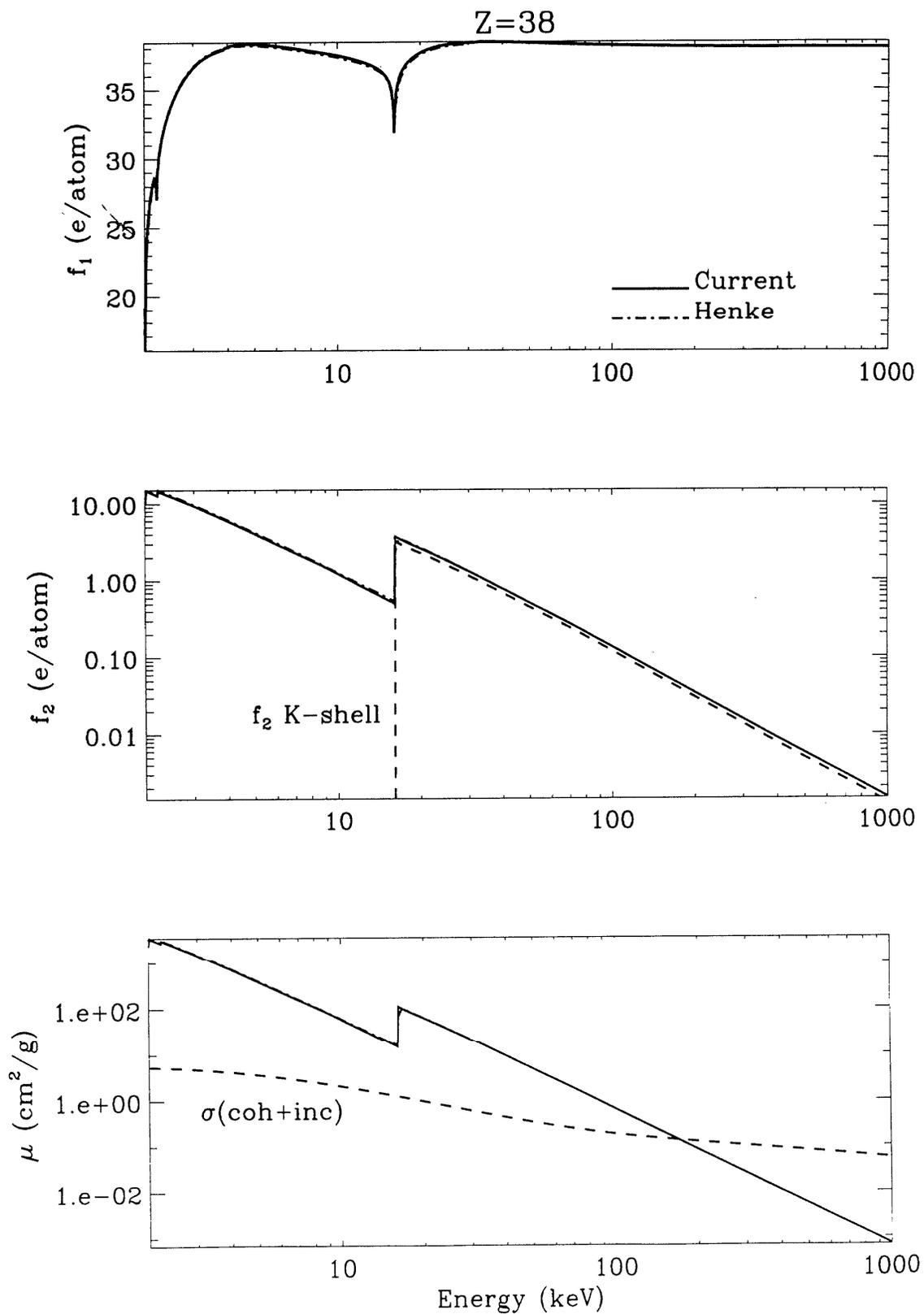
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.96664E+00	2.06160E+01	1.1103E+01	2.7113E+03	5.5004E+00	0.000E+00	6.304E-01
1.978392E+00	2.12315E+01	1.0989E+01	2.6677E+03	5.4959E+00	0.000E+00	6.267E-01
1.996766E+00	2.10047E+01	1.0815E+01	2.6012E+03	5.4887E+00	0.000E+00	6.209E-01
2.004793E+00	1.92132E+01	1.0740E+01	2.5728E+03	5.4855E+00	0.000E+00	6.184E-01
2.016834E+00	2.19144E+01	1.4918E+01	3.5523E+03	5.4806E+00	0.000E+00	6.147E-01
2.046936E+00	2.48433E+01	1.4547E+01	3.4132E+03	5.4679E+00	0.000E+00	6.057E-01
2.080733E+00	2.64766E+01	1.4159E+01	3.2682E+03	5.4530E+00	0.000E+00	5.959E-01
2.171974E+00	2.85735E+01	1.3212E+01	2.9213E+03	5.4099E+00	0.000E+00	5.708E-01
2.205219E+00	2.84259E+01	1.2897E+01	2.8087E+03	5.3933E+00	0.000E+00	5.622E-01
2.214084E+00	2.76147E+01	1.2815E+01	2.7797E+03	5.3887E+00	0.000E+00	5.600E-01
2.224304E+00	2.85604E+01	1.4635E+01	3.1599E+03	5.3835E+00	0.000E+00	5.574E-01
2.227382E+00	2.88147E+01	1.4605E+01	3.1490E+03	5.3819E+00	0.000E+00	5.566E-01
2.260626E+00	3.02095E+01	1.4284E+01	3.0346E+03	5.3645E+00	0.000E+00	5.485E-01
2.377781E+00	3.24386E+01	1.3260E+01	2.6781E+03	5.3000E+00	0.000E+00	5.214E-01
2.541848E+00	3.41917E+01	1.2045E+01	2.2758E+03	5.2034E+00	0.000E+00	4.878E-01
2.717235E+00	3.53853E+01	1.0915E+01	1.9291E+03	5.0948E+00	0.000E+00	4.563E-01
2.904724E+00	3.62474E+01	9.8856E+00	1.6345E+03	4.9750E+00	0.000E+00	4.268E-01
3.105150E+00	3.68987E+01	8.9071E+00	1.3776E+03	4.8452E+00	0.000E+00	3.993E-01
3.319406E+00	3.73400E+01	7.9961E+00	1.1569E+03	4.7066E+00	0.000E+00	3.735E-01
3.548445E+00	3.76486E+01	7.1843E+00	9.7235E+02	4.5602E+00	0.000E+00	3.494E-01
3.793288E+00	3.78686E+01	6.4604E+00	8.1794E+02	4.4072E+00	0.000E+00	3.269E-01
4.055024E+00	3.81720E+01	5.7885E+00	6.8557E+02	4.2487E+00	0.000E+00	3.058E-01
4.334821E+00	3.82552E+01	5.1674E+00	5.7250E+02	4.0860E+00	0.000E+00	2.860E-01
4.633924E+00	3.83309E+01	4.6063E+00	4.7739E+02	3.9201E+00	0.000E+00	2.676E-01
4.953664E+00	3.83224E+01	4.1044E+00	3.9792E+02	3.7521E+00	0.000E+00	2.503E-01
5.295467E+00	3.82855E+01	3.6580E+00	3.3175E+02	3.5830E+00	0.000E+00	2.341E-01
5.660855E+00	3.82285E+01	3.2608E+00	2.7664E+02	3.4138E+00	0.000E+00	2.190E-01
6.051453E+00	3.81577E+01	2.9094E+00	2.3090E+02	3.2454E+00	0.000E+00	2.049E-01
6.469004E+00	3.80780E+01	2.5983E+00	1.9290E+02	3.0787E+00	0.000E+00	1.917E-01
6.915365E+00	3.79926E+01	2.3221E+00	1.6127E+02	2.9144E+00	0.000E+00	1.793E-01
7.392525E+00	3.79036E+01	2.0766E+00	1.3491E+02	2.7532E+00	0.000E+00	1.677E-01
7.902609E+00	3.78125E+01	1.8587E+00	1.1296E+02	2.5957E+00	0.000E+00	1.569E-01
8.447890E+00	3.77216E+01	1.6649E+00	9.4649E+01	2.4425E+00	0.000E+00	1.468E-01
9.030794E+00	3.76321E+01	1.4831E+00	7.8870E+01	2.2941E+00	0.000E+00	1.373E-01
9.653919E+00	3.75290E+01	1.3088E+00	6.5108E+01	2.1508E+00	0.000E+00	1.284E-01
1.032004E+01	3.74095E+01	1.1512E+00	5.3571E+01	2.0130E+00	0.000E+00	1.201E-01
1.103212E+01	3.72732E+01	1.0135E+00	4.4120E+01	1.8809E+00	0.000E+00	1.124E-01
1.179334E+01	3.71160E+01	8.9312E-01	3.6370E+01	1.7548E+00	0.000E+00	1.051E-01
1.260708E+01	3.69268E+01	7.8780E-01	3.0011E+01	1.6347E+00	0.000E+00	9.834E-02
1.347697E+01	3.66805E+01	6.9556E-01	2.4787E+01	1.5207E+00	0.000E+00	9.200E-02
1.440688E+01	3.63115E+01	6.1469E-01	2.0491E+01	1.4128E+00	0.000E+00	8.606E-02
1.540095E+01	3.55447E+01	5.4374E-01	1.6956E+01	1.3110E+00	0.000E+00	8.050E-02
1.578251E+01	3.48227E+01	5.1994E-01	1.5822E+01	1.2752E+00	0.000E+00	7.856E-02
1.602408E+01	3.34696E+01	5.0573E-01	1.5157E+01	1.2534E+00	0.000E+00	7.737E-02
1.608850E+01	3.18377E+01	5.0204E-01	1.4987E+01	1.2477E+00	0.000E+00	7.706E-02
1.618512E+01	3.35041E+01	3.7145E+00	1.1022E+02	1.2392E+00	9.548E+01	7.660E-02
1.642669E+01	3.50109E+01	3.6075E+00	1.0547E+02	1.2184E+00	9.134E+01	7.548E-02
1.646362E+01	3.51310E+01	3.5915E+00	1.0477E+02	1.2153E+00	9.072E+01	7.531E-02
1.759961E+01	3.66899E+01	3.1809E+00	8.6799E+01	1.1255E+00	7.516E+01	7.045E-02
1.881398E+01	3.72957E+01	2.8540E+00	7.2853E+01	1.0414E+00	6.319E+01	6.590E-02
2.011215E+01	3.76587E+01	2.5703E+00	6.1375E+01	9.6301E-01	5.335E+01	6.165E-02
2.149988E+01	3.79092E+01	2.3100E+00	5.1601E+01	8.9001E-01	4.493E+01	5.767E-02
2.298338E+01	3.80799E+01	2.0662E+00	4.3175E+01	8.2224E-01	3.763E+01	5.395E-02
2.456923E+01	3.81970E+01	1.8459E+00	3.6083E+01	7.5945E-01	3.147E+01	5.046E-02
2.626450E+01	3.82782E+01	1.6484E+00	3.0142E+01	7.0142E-01	2.630E+01	4.721E-02
2.807676E+01	3.83342E+01	1.4669E+00	2.5091E+01	6.4790E-01	2.192E+01	4.416E-02
3.001405E+01	3.83668E+01	1.3039E+00	2.0864E+01	5.9864E-01	1.826E+01	4.131E-02
3.208502E+01	3.83854E+01	1.1592E+00	1.7351E+01	5.5340E-01	1.521E+01	3.864E-02
3.429889E+01	3.84267E+01	1.0241E+00	1.4340E+01	5.1193E-01	1.258E+01	3.615E-02
3.666551E+01	3.84218E+01	9.0457E-01	1.1848E+01	4.7398E-01	1.040E+01	3.381E-02
3.919543E+01	3.84101E+01	7.9901E-01	9.7903E+00	4.3930E-01	8.595E+00	3.163E-02
4.189992E+01	3.83941E+01	7.0582E-01	8.0901E+00	4.0767E-01	7.105E+00	2.959E-02
4.479101E+01	3.83754E+01	6.2346E-01	6.6849E+00	3.7886E-01	5.873E+00	2.768E-02
4.788159E+01	3.83551E+01	5.5068E-01	5.5233E+00	3.5265E-01	4.855E+00	2.589E-02
5.118542E+01	3.83340E+01	4.8613E-01	4.5612E+00	3.2884E-01	4.013E+00	2.422E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
5.471721E+01	3.83126E+01	4.2918E-01	3.7670E+00	3.0721E-01	3.318E+00	2.266E-02
5.849270E+01	3.82914E+01	3.7893E-01	3.1112E+00	2.8759E-01	2.743E+00	2.120E-02
6.252870E+01	3.82709E+01	3.3458E-01	2.5698E+00	2.6980E-01	2.267E+00	1.983E-02
6.684318E+01	3.82512E+01	2.9544E-01	2.1227E+00	2.5367E-01	1.874E+00	1.855E-02
7.145536E+01	3.82327E+01	2.6046E-01	1.7506E+00	2.3905E-01	1.546E+00	1.735E-02
7.638578E+01	3.82149E+01	2.2893E-01	1.4393E+00	2.2578E-01	1.271E+00	1.623E-02
8.165640E+01	3.81983E+01	2.0103E-01	1.1824E+00	2.1374E-01	1.044E+00	1.518E-02
8.729069E+01	3.81818E+01	1.7615E-01	9.6916E-01	2.0281E-01	8.557E-01	1.420E-02
9.331374E+01	3.81662E+01	1.5436E-01	7.9445E-01	1.9286E-01	7.012E-01	1.329E-02
9.975239E+01	3.81515E+01	1.3527E-01	6.5126E-01	1.8380E-01	5.746E-01	1.243E-02
1.066353E+02	3.81379E+01	1.1855E-01	5.3390E-01	1.7552E-01	4.709E-01	1.163E-02
1.139931E+02	3.81252E+01	1.0389E-01	4.3771E-01	1.6795E-01	3.859E-01	1.088E-02
1.218587E+02	3.81136E+01	9.1057E-02	3.5886E-01	1.6100E-01	3.162E-01	1.017E-02
1.302669E+02	3.81029E+01	7.9809E-02	2.9423E-01	1.5459E-01	2.591E-01	9.518E-03
1.392553E+02	3.80931E+01	6.9953E-02	2.4125E-01	1.4867E-01	2.123E-01	8.903E-03
1.488640E+02	3.80841E+01	6.1317E-02	1.9782E-01	1.4318E-01	1.740E-01	8.329E-03
1.591356E+02	3.80759E+01	5.3749E-02	1.6221E-01	1.3807E-01	1.426E-01	7.791E-03
1.701159E+02	3.80684E+01	4.7116E-02	1.3302E-01	1.3328E-01	1.168E-01	7.288E-03
1.818539E+02	3.80617E+01	4.1304E-02	1.0908E-01	1.2878E-01	9.575E-02	6.818E-03
1.944018E+02	3.80555E+01	3.6210E-02	8.9454E-02	1.2453E-01	7.846E-02	6.378E-03
2.078156E+02	3.80499E+01	3.1745E-02	7.3362E-02	1.2051E-01	6.429E-02	5.966E-03
2.221548E+02	3.80449E+01	2.7832E-02	6.0167E-02	1.1667E-01	5.269E-02	5.581E-03
2.374835E+02	3.80403E+01	2.4401E-02	4.9347E-02	1.1301E-01	4.317E-02	5.221E-03
2.538699E+02	3.80362E+01	2.1395E-02	4.0474E-02	1.0949E-01	3.538E-02	4.884E-03
2.713869E+02	3.80324E+01	1.8759E-02	3.3197E-02	1.0610E-01	2.899E-02	4.569E-03
2.901126E+02	3.80291E+01	1.6449E-02	2.7229E-02	1.0282E-01	2.376E-02	4.274E-03
3.101304E+02	3.80261E+01	1.4423E-02	2.2335E-02	9.9641E-02	1.947E-02	3.998E-03
3.315294E+02	3.80233E+01	1.2647E-02	1.8321E-02	9.6551E-02	1.595E-02	3.740E-03
3.544049E+02	3.80209E+01	1.1091E-02	1.5029E-02	9.3540E-02	1.307E-02	3.498E-03
3.788588E+02	3.80187E+01	9.7258E-03	1.2329E-02	9.0601E-02	1.071E-02	3.273E-03
4.050001E+02	3.80167E+01	8.5292E-03	1.0114E-02	8.7726E-02	8.779E-03	3.061E-03
4.329451E+02	3.80149E+01	7.4800E-03	8.2974E-03	8.4911E-02	7.194E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 299

Y Z = 39

Atomic weight = 8.890590E+01 g/mol, nominal density ρ (g/cm³) = 4.4560E+00

μ_f (barns/atom) = μ (cm²/g) \times 1.47632E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.73313E+05

12 edges. Edge energies (keV):

K		1.70384E+00	L	I	2.37250E+00	L	II	2.15550E+00	L	III	2.08000E+00
M	I	3.93600E-00	M	II	3.12400E-00	M	III	3.00300E-00	M	IV	1.59600E-01
M	V	1.57400E-00	N	I	4.54000E-02	N	II	2.56000E-02	N	III	2.56000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.8657E-01, -1.8000E-01 e/atom
 Nuclear Thomson correction f_{NT} = -9.3851E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	9.25807E+00	0.0000E+00	0.0000E+00	1.3109E-04	0.000E+00	1.160E+02
1.142761E-02	9.21353E+00	0.0000E+00	0.0000E+00	1.7925E-04	0.000E+00	1.085E+02
1.221612E-02	9.16034E+00	0.0000E+00	0.0000E+00	2.4378E-04	0.000E+00	1.015E+02
1.305903E-02	9.09630E+00	0.0000E+00	0.0000E+00	3.2978E-04	0.000E+00	9.494E+01
1.396010E-02	9.01842E+00	0.0000E+00	0.0000E+00	4.4374E-04	0.000E+00	8.881E+01
1.492335E-02	8.92250E+00	0.0000E+00	0.0000E+00	5.9393E-04	0.000E+00	8.308E+01
1.595306E-02	8.80243E+00	0.0000E+00	0.0000E+00	7.9078E-04	0.000E+00	7.772E+01
1.705382E-02	8.64897E+00	0.0000E+00	0.0000E+00	1.0474E-03	0.000E+00	7.270E+01
1.823053E-02	8.44706E+00	0.0000E+00	0.0000E+00	1.3800E-03	0.000E+00	6.801E+01
1.948844E-02	8.17048E+00	0.0000E+00	0.0000E+00	1.8090E-03	0.000E+00	6.362E+01
2.083314E-02	7.76777E+00	0.0000E+00	0.0000E+00	2.3591E-03	0.000E+00	5.951E+01
2.227063E-02	7.11823E+00	0.0000E+00	0.0000E+00	3.0608E-03	0.000E+00	5.567E+01
2.380730E-02	5.82478E+00	0.0000E+00	0.0000E+00	3.9512E-03	0.000E+00	5.208E+01
2.508800E-02	2.66593E+00	0.0000E+00	0.0000E+00	4.8114E-03	0.000E+00	4.942E+01
2.545001E-02	-8.83560E-01	0.0000E+00	0.0000E+00	5.0749E-03	0.000E+00	4.872E+01
2.547200E-02	-1.36180E+00	0.0000E+00	0.0000E+00	5.0912E-03	0.000E+00	4.867E+01
2.557440E-02	-6.35333E+00	0.0000E+00	0.0000E+00	5.1675E-03	0.000E+00	4.848E+01
2.572800E-02	-9.23289E-01	9.9117E+00	1.8234E+05	5.2835E-03	0.000E+00	4.819E+01
2.611200E-02	3.88163E+00	9.4699E+00	1.7165E+05	5.5806E-03	0.000E+00	4.748E+01
2.720606E-02	8.00855E+00	8.3480E+00	1.4523E+05	6.4857E-03	0.000E+00	4.557E+01
2.908327E-02	1.06268E+01	6.7893E+00	1.1049E+05	8.2475E-03	0.000E+00	4.263E+01
3.109002E-02	1.18406E+01	5.4440E+00	8.2879E+04	1.0436E-02	0.000E+00	3.988E+01
3.323523E-02	1.24062E+01	4.3240E+00	6.1580E+04	1.3141E-02	0.000E+00	3.731E+01
3.52846E-02	1.26179E+01	3.4253E+00	4.5632E+04	1.6467E-02	0.000E+00	3.490E+01
3.797993E-02	1.26306E+01	2.7216E+00	3.3917E+04	2.0534E-02	0.000E+00	3.264E+01
4.060054E-02	1.25313E+01	2.1790E+00	2.5402E+04	2.5483E-02	0.000E+00	3.054E+01
4.340198E-02	1.23632E+01	1.7643E+00	1.9240E+04	3.1474E-02	0.000E+00	2.857E+01
4.449200E-02	1.22795E+01	1.6368E+00	1.7412E+04	3.4003E-02	0.000E+00	2.787E+01
4.517300E-02	1.22020E+01	1.5648E+00	1.6396E+04	3.5640E-02	0.000E+00	2.745E+01
4.535460E-02	1.21481E+01	1.5466E+00	1.6140E+04	3.6083E-02	0.000E+00	2.734E+01
4.562700E-02	1.21734E+01	1.6040E+00	1.6639E+04	3.6755E-02	0.000E+00	2.717E+01
4.630800E-02	1.21689E+01	1.5441E+00	1.5782E+04	3.8464E-02	0.000E+00	2.677E+01
4.639671E-02	1.21661E+01	1.5367E+00	1.5676E+04	3.8690E-02	0.000E+00	2.672E+01
4.959809E-02	1.20224E+01	1.3140E+00	1.2540E+04	4.7336E-02	0.000E+00	2.500E+01
5.302035E-02	1.18616E+01	1.1510E+00	1.0275E+04	5.7644E-02	0.000E+00	2.338E+01
5.667876E-02	1.17016E+01	1.0318E+00	8.6162E+03	6.9871E-02	0.000E+00	2.187E+01
6.058959E-02	1.15446E+01	9.4549E-01	7.3859E+03	8.4301E-02	0.000E+00	2.046E+01
6.477028E-02	1.13895E+01	8.8383E-01	6.4587E+03	1.0125E-01	0.000E+00	1.914E+01
6.923942E-02	1.12337E+01	8.4065E-01	5.7466E+03	1.2105E-01	0.000E+00	1.791E+01
7.401695E-02	1.10734E+01	8.1131E-01	5.1881E+03	1.4407E-01	0.000E+00	1.675E+01
7.912411E-02	1.09135E+01	7.9235E-01	4.7398E+03	1.7070E-01	0.000E+00	1.567E+01
8.458368E-02	1.07301E+01	7.8119E-01	4.3714E+03	2.0135E-01	0.000E+00	1.466E+01
9.041995E-02	1.05260E+01	7.7590E-01	4.0615E+03	2.3646E-01	0.000E+00	1.371E+01
9.665893E-02	1.02930E+01	7.7504E-01	3.7951E+03	2.7648E-01	0.000E+00	1.283E+01
1.033284E-01	1.00210E+01	7.7753E-01	3.5616E+03	3.2186E-01	0.000E+00	1.200E+01
1.104581E-01	9.69578E+00	7.8263E-01	3.3536E+03	3.7308E-01	0.000E+00	1.122E+01
1.180797E-01	9.29754E+00	7.8967E-01	3.1653E+03	4.3060E-01	0.000E+00	1.050E+01
1.262272E-01	8.79516E+00	7.9802E-01	2.9923E+03	4.9488E-01	0.000E+00	9.822E+00
1.349368E-01	8.13454E+00	8.0718E-01	2.8313E+03	5.6636E-01	0.000E+00	9.188E+00
1.442475E-01	7.20073E+00	8.1672E-01	2.6799E+03	6.4545E-01	0.000E+00	8.595E+00
1.542005E-01	5.55290E+00	8.2624E-01	2.5361E+03	7.3253E-01	0.000E+00	8.040E+00
1.542520E-01	5.53953E+00	8.2629E-01	2.5354E+03	7.3298E-01	0.000E+00	8.038E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.564080E-01	4.79154E+00	8.2823E-01	2.5064E+03	7.5214E-01	0.000E+00	7.927E+00
1.566130E-01	4.67786E+00	8.2842E-01	2.5036E+03	7.5397E-01	0.000E+00	7.917E+00
1.572426E-01	4.05410E+00	8.2898E-01	2.4953E+03	7.5958E-01	0.000E+00	7.885E+00
1.581870E-01	4.23245E+00	1.7739E+00	5.3078E+03	7.6802E-01	0.000E+00	7.838E+00
1.588020E-01	4.17477E+00	1.8063E+00	5.3837E+03	7.7353E-01	0.000E+00	7.807E+00
1.594404E-01	3.84776E+00	1.8409E+00	5.4647E+03	7.7925E-01	0.000E+00	7.776E+00
1.603980E-01	4.09204E+00	2.5368E+00	7.4858E+03	7.8784E-01	0.000E+00	7.730E+00
1.605480E-01	4.11345E+00	2.5506E+00	7.5193E+03	7.8919E-01	0.000E+00	7.723E+00
1.627920E-01	4.13332E+00	2.7681E+00	8.0482E+03	8.0941E-01	0.000E+00	7.616E+00
1.648404E-01	4.00162E+00	2.9871E+00	8.5770E+03	8.2793E-01	0.000E+00	7.521E+00
1.762144E-01	2.92375E+00	4.6314E+00	1.2440E+04	9.3194E-01	0.000E+00	7.036E+00
1.883732E-01	2.16988E+00	6.9768E+00	1.7530E+04	1.0448E+00	0.000E+00	6.582E+00
2.013709E-01	2.08958E+00	9.7069E+00	2.2816E+04	1.1665E+00	0.000E+00	6.157E+00
2.152655E-01	2.79942E+00	1.2508E+01	2.7501E+04	1.2973E+00	0.000E+00	5.760E+00
2.301188E-01	4.24554E+00	1.5059E+01	3.0974E+04	1.4371E+00	0.000E+00	5.388E+00
2.459970E-01	6.23497E+00	1.7117E+01	3.2933E+04	1.5856E+00	0.000E+00	5.040E+00
2.629708E-01	8.48830E+00	1.8549E+01	3.3387E+04	1.7427E+00	0.000E+00	4.715E+00
2.811158E-01	1.06387E+01	1.9336E+01	3.2557E+04	1.9080E+00	0.000E+00	4.410E+00
2.942940E-01	1.15884E+01	1.9531E+01	3.1412E+04	2.0259E+00	0.000E+00	4.213E+00
2.987985E-01	1.12613E+01	1.9540E+01	3.0952E+04	2.0658E+00	0.000E+00	4.149E+00
2.999997E-01	1.04367E+01	1.9538E+01	3.0825E+04	2.0764E+00	0.000E+00	4.133E+00
3.005128E-01	1.02828E+01	2.1378E+01	3.3670E+04	2.0809E+00	0.000E+00	4.126E+00
3.018015E-01	1.15479E+01	2.1381E+01	3.3532E+04	2.0923E+00	0.000E+00	4.108E+00
3.061520E-01	1.27165E+01	2.1378E+01	3.3051E+04	2.1304E+00	0.000E+00	4.050E+00
3.063060E-01	1.27431E+01	2.1378E+01	3.3034E+04	2.1318E+00	0.000E+00	4.048E+00
3.108380E-01	1.32377E+01	2.1353E+01	3.2514E+04	2.1712E+00	0.000E+00	3.989E+00
3.120876E-01	1.30303E+01	2.1343E+01	3.2369E+04	2.1821E+00	0.000E+00	3.973E+00
3.139620E-01	1.37281E+01	2.2129E+01	3.3361E+04	2.1983E+00	0.000E+00	3.949E+00
3.186480E-01	1.47549E+01	2.2086E+01	3.2806E+04	2.2387E+00	0.000E+00	3.891E+00
3.212482E-01	1.51933E+01	2.2055E+01	3.2494E+04	2.2610E+00	0.000E+00	3.859E+00
3.434143E-01	1.80485E+01	2.1616E+01	2.9792E+04	2.4474E+00	0.000E+00	3.610E+00
3.671099E-01	2.02626E+01	2.0907E+01	2.6955E+04	2.6392E+00	0.000E+00	3.377E+00
3.857280E-01	2.14535E+01	2.0256E+01	2.4856E+04	2.7845E+00	0.000E+00	3.214E+00
3.916320E-01	2.14973E+01	2.0041E+01	2.4221E+04	2.8295E+00	0.000E+00	3.166E+00
3.924405E-01	2.14060E+01	2.0011E+01	2.4135E+04	2.8356E+00	0.000E+00	3.159E+00
3.932064E-01	2.11563E+01	1.9983E+01	2.4054E+04	2.8414E+00	0.000E+00	3.153E+00
3.955680E-01	2.17734E+01	2.0780E+01	2.4864E+04	2.8593E+00	0.000E+00	3.134E+00
4.014720E-01	2.25608E+01	2.0562E+01	2.4242E+04	2.9035E+00	0.000E+00	3.088E+00
4.195189E-01	2.39959E+01	1.9893E+01	2.2444E+04	3.0355E+00	0.000E+00	2.955E+00
4.484657E-01	2.56660E+01	1.8833E+01	1.9876E+04	3.2377E+00	0.000E+00	2.765E+00
4.794098E-01	2.70341E+01	1.7749E+01	1.7523E+04	3.4409E+00	0.000E+00	2.586E+00
5.124891E-01	2.81698E+01	1.6659E+01	1.5386E+04	3.6439E+00	0.000E+00	2.419E+00
5.478508E-01	2.91188E+01	1.5589E+01	1.3468E+04	3.8452E+00	0.000E+00	2.263E+00
5.856525E-01	2.99121E+01	1.4551E+01	1.1760E+04	4.0435E+00	0.000E+00	2.117E+00
6.260625E-01	3.05739E+01	1.3552E+01	1.0246E+04	4.2372E+00	0.000E+00	1.980E+00
6.692609E-01	3.11231E+01	1.2594E+01	8.9069E+03	4.4251E+00	0.000E+00	1.853E+00
7.154399E-01	3.15714E+01	1.1678E+01	7.7257E+03	4.6055E+00	0.000E+00	1.733E+00
7.648052E-01	3.19301E+01	1.0807E+01	6.6884E+03	4.7772E+00	0.000E+00	1.621E+00
8.175768E-01	3.22102E+01	9.9856E+00	5.7809E+03	4.9388E+00	0.000E+00	1.516E+00
8.739896E-01	3.24224E+01	9.2134E+00	4.9896E+03	5.0890E+00	0.000E+00	1.419E+00
9.342948E-01	3.25811E+01	8.4907E+00	4.3014E+03	5.2266E+00	0.000E+00	1.327E+00
9.987612E-01	3.26957E+01	7.8172E+00	3.7046E+03	5.3507E+00	0.000E+00	1.241E+00
1.067676E+00	3.27199E+01	7.0930E+00	3.1444E+03	5.4601E+00	0.000E+00	1.161E+00
1.141345E+00	3.26594E+01	6.4399E+00	2.6706E+03	5.5542E+00	0.000E+00	1.086E+00
1.220098E+00	3.25330E+01	5.8454E+00	2.2676E+03	5.6322E+00	0.000E+00	1.016E+00
1.304285E+00	3.23292E+01	5.2774E+00	1.9151E+03	5.6937E+00	0.000E+00	9.506E-01
1.394281E+00	3.20337E+01	4.7662E+00	1.6180E+03	5.7381E+00	0.000E+00	8.892E-01
1.490486E+00	3.16382E+01	4.3109E+00	1.3689E+03	5.7654E+00	0.000E+00	8.318E-01
1.593329E+00	3.11118E+01	3.9039E+00	1.1597E+03	5.7755E+00	0.000E+00	7.781E-01
1.703269E+00	3.03822E+01	3.5370E+00	9.8289E+02	5.7685E+00	0.000E+00	7.279E-01
1.820795E+00	2.92819E+01	3.2091E+00	8.3419E+02	5.7446E+00	0.000E+00	6.809E-01
1.946430E+00	2.72756E+01	2.9155E+00	7.0895E+02	5.7043E+00	0.000E+00	6.370E-01
2.038400E+00	2.37509E+01	2.7303E+00	6.3397E+02	5.6671E+00	0.000E+00	6.082E-01
2.069600E+00	1.97463E+01	2.6724E+00	6.1117E+02	5.6532E+00	0.000E+00	5.991E-01
2.077920E+00	1.52496E+01	2.6573E+00	6.0529E+02	5.6494E+00	0.000E+00	5.967E-01

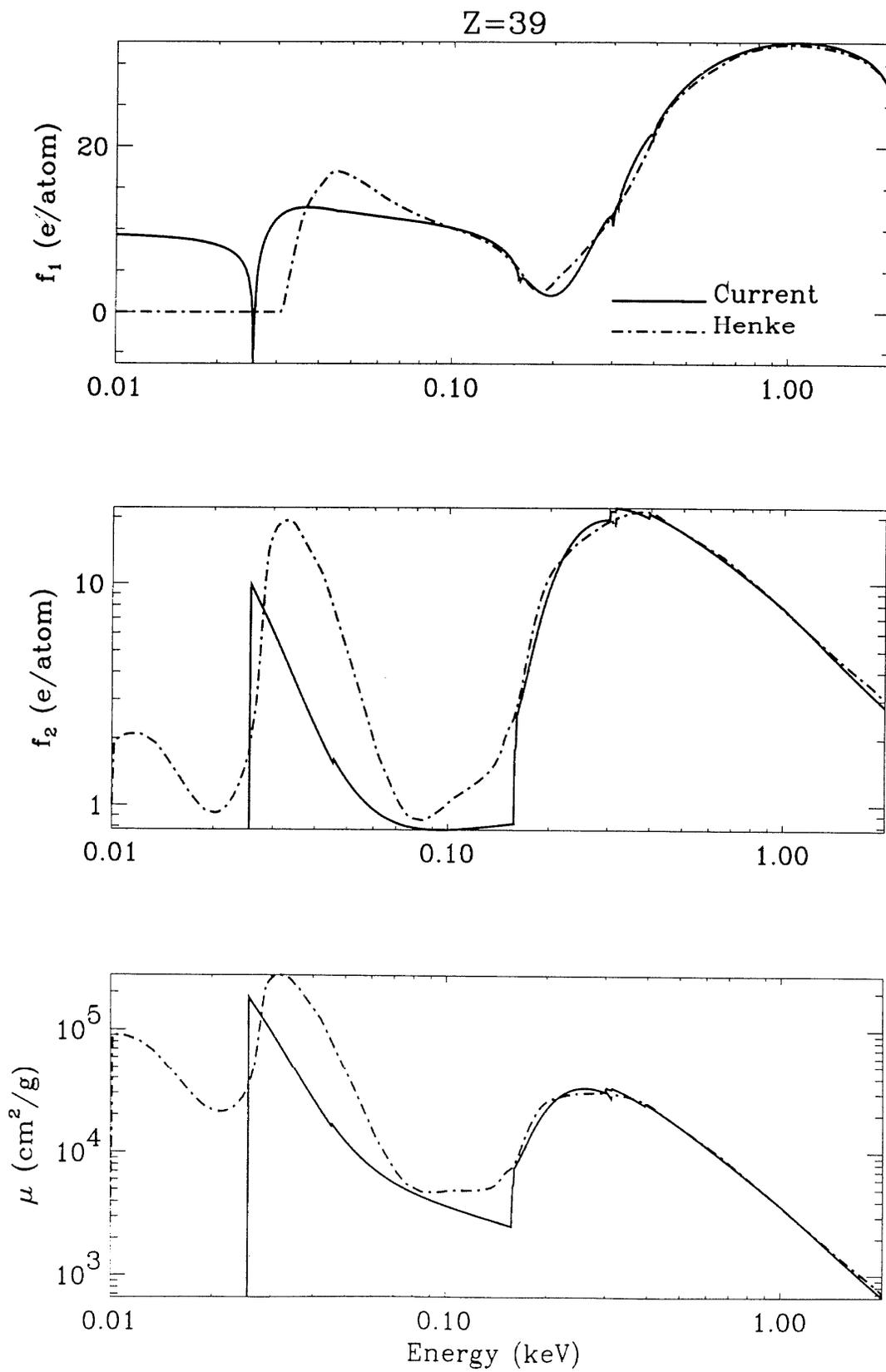
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 301

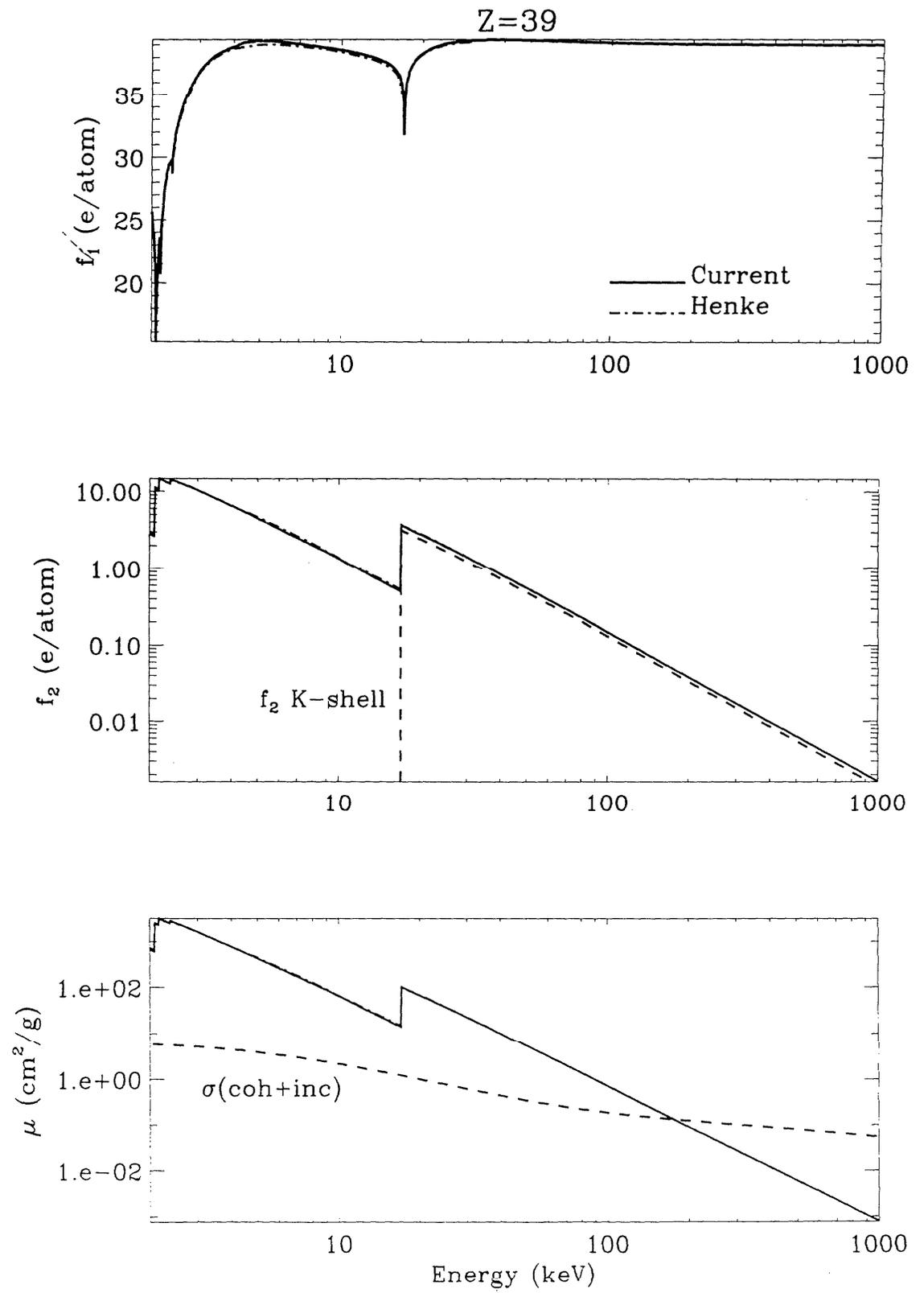
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.080733E+00	1.22125E+01	1.1347E+01	2.5812E+03	5.6482E+00	0.000E+00	5.959E-01
2.090400E+00	1.94878E+01	1.1250E+01	2.5472E+03	5.6437E+00	0.000E+00	5.931E-01
2.112390E+00	2.22543E+01	1.1032E+01	2.4719E+03	5.6333E+00	0.000E+00	5.869E-01
2.121600E+00	2.26814E+01	1.0943E+01	2.4413E+03	5.6289E+00	0.000E+00	5.844E-01
2.144722E+00	2.24813E+01	1.0724E+01	2.3666E+03	5.6176E+00	0.000E+00	5.781E-01
2.153344E+00	2.06853E+01	1.0644E+01	2.3396E+03	5.6133E+00	0.000E+00	5.758E-01
2.166277E+00	2.33438E+01	1.4777E+01	3.2286E+03	5.6068E+00	0.000E+00	5.723E-01
2.198610E+00	2.62000E+01	1.4387E+01	3.0972E+03	5.5902E+00	0.000E+00	5.639E-01
2.224304E+00	2.73921E+01	1.4100E+01	3.0005E+03	5.5767E+00	0.000E+00	5.574E-01
2.325050E+00	2.96519E+01	1.3101E+01	2.6670E+03	5.5213E+00	0.000E+00	5.333E-01
2.360637E+00	2.95060E+01	1.2787E+01	2.5638E+03	5.5009E+00	0.000E+00	5.252E-01
2.370127E+00	2.86977E+01	1.2706E+01	2.5373E+03	5.4954E+00	0.000E+00	5.231E-01
2.377781E+00	2.92895E+01	1.4549E+01	2.8961E+03	5.4909E+00	0.000E+00	5.214E-01
2.384362E+00	2.98931E+01	1.4489E+01	2.8762E+03	5.4871E+00	0.000E+00	5.200E-01
2.419950E+00	3.12811E+01	1.4173E+01	2.7721E+03	5.4660E+00	0.000E+00	5.123E-01
2.541848E+00	3.34343E+01	1.3193E+01	2.4567E+03	5.3916E+00	0.000E+00	4.878E-01
2.717235E+00	3.52232E+01	1.1997E+01	2.0897E+03	5.2796E+00	0.000E+00	4.563E-01
2.904724E+00	3.64368E+01	1.0880E+01	1.7728E+03	5.1562E+00	0.000E+00	4.268E-01
3.105150E+00	3.73289E+01	9.8107E+00	1.4954E+03	5.0224E+00	0.000E+00	3.993E-01
3.319406E+00	3.79344E+01	8.8048E+00	1.2555E+03	4.8793E+00	0.000E+00	3.735E-01
3.548445E+00	3.83570E+01	7.9085E+00	1.0549E+03	4.7282E+00	0.000E+00	3.494E-01
3.793288E+00	3.86559E+01	7.1093E+00	8.8708E+02	4.5703E+00	0.000E+00	3.269E-01
4.055024E+00	3.88701E+01	6.3963E+00	7.4659E+02	4.4066E+00	0.000E+00	3.058E-01
4.334821E+00	3.91683E+01	5.7359E+00	6.2629E+02	4.2385E+00	0.000E+00	2.860E-01
4.633924E+00	3.92510E+01	5.1210E+00	5.2306E+02	4.0670E+00	0.000E+00	2.676E-01
4.953664E+00	3.93244E+01	4.5662E+00	4.3629E+02	3.8933E+00	0.000E+00	2.503E-01
5.295467E+00	3.93154E+01	4.0696E+00	3.6374E+02	3.7184E+00	0.000E+00	2.341E-01
5.660855E+00	3.92785E+01	3.6301E+00	3.0352E+02	3.5433E+00	0.000E+00	2.190E-01
6.051453E+00	3.92227E+01	3.2375E+00	2.5322E+02	3.3690E+00	0.000E+00	2.049E-01
6.469904E+00	3.91530E+01	2.8894E+00	2.1140E+02	3.1964E+00	0.000E+00	1.917E-01
6.915365E+00	3.90743E+01	2.5811E+00	1.7666E+02	3.0262E+00	0.000E+00	1.793E-01
7.392525E+00	3.89901E+01	2.3079E+00	1.4777E+02	2.8592E+00	0.000E+00	1.677E-01
7.902609E+00	3.89024E+01	2.0645E+00	1.2365E+02	2.6961E+00	0.000E+00	1.569E-01
8.447890E+00	3.88129E+01	1.8485E+00	1.0357E+02	2.5373E+00	0.000E+00	1.468E-01
9.030794E+00	3.87295E+01	1.6525E+00	8.6612E+01	2.3834E+00	0.000E+00	1.373E-01
9.653919E+00	3.86362E+01	1.4600E+00	7.1579E+01	2.2348E+00	0.000E+00	1.284E-01
1.032004E+01	3.85263E+01	1.2899E+00	5.9158E+01	2.0918E+00	0.000E+00	1.201E-01
1.103212E+01	3.84030E+01	1.1357E+00	4.8724E+01	1.9547E+00	0.000E+00	1.124E-01
1.179334E+01	3.82634E+01	1.0008E+00	4.0167E+01	1.8238E+00	0.000E+00	1.051E-01
1.260708E+01	3.81022E+01	8.8275E-01	3.3141E+01	1.6990E+00	0.000E+00	9.834E-02
1.347697E+01	3.79068E+01	7.7932E-01	2.7370E+01	1.5806E+00	0.000E+00	9.200E-02
1.440688E+01	3.76486E+01	6.8866E-01	2.2625E+01	1.4685E+00	0.000E+00	8.606E-02
1.540095E+01	3.72495E+01	6.0910E-01	1.8719E+01	1.3627E+00	0.000E+00	8.050E-02
1.646362E+01	3.63315E+01	5.3924E-01	1.5502E+01	1.2632E+00	0.000E+00	7.531E-02
1.669763E+01	3.58476E+01	5.2558E-01	1.4898E+01	1.2429E+00	0.000E+00	7.425E-02
1.695321E+01	3.45036E+01	5.1129E-01	1.4275E+01	1.2214E+00	0.000E+00	7.313E-02
1.702136E+01	3.28830E+01	5.0758E-01	1.4114E+01	1.2158E+00	0.000E+00	7.284E-02
1.712359E+01	3.45372E+01	3.6974E+00	1.0220E+02	1.2074E+00	8.832E+01	7.241E-02
1.737917E+01	3.60327E+01	3.5922E+00	9.7831E+01	1.1869E+00	8.452E+01	7.134E-02
1.759961E+01	3.65825E+01	3.5050E+00	9.4262E+01	1.1698E+00	8.141E+01	7.045E-02
1.881398E+01	3.78229E+01	3.1169E+00	7.8414E+01	1.0823E+00	6.775E+01	6.590E-02
2.011215E+01	3.83725E+01	2.7995E+00	6.5883E+01	1.0007E+00	5.703E+01	6.165E-02
2.149988E+01	3.87118E+01	2.5209E+00	5.5496E+01	9.2475E-01	4.814E+01	5.767E-02
2.298338E+01	3.89467E+01	2.2626E+00	4.6596E+01	8.5417E-01	4.048E+01	5.395E-02
2.456923E+01	3.91063E+01	2.0235E+00	3.8982E+01	7.8877E-01	3.389E+01	5.046E-02
2.626450E+01	3.92168E+01	1.8082E+00	3.2586E+01	7.2831E-01	2.834E+01	4.721E-02
2.807676E+01	3.92939E+01	1.6098E+00	2.7138E+01	6.7253E-01	2.364E+01	4.416E-02
3.001405E+01	3.93414E+01	1.4316E+00	2.2576E+01	6.2117E-01	1.970E+01	4.131E-02
3.208502E+01	3.93703E+01	1.2733E+00	1.8783E+01	5.7399E-01	1.642E+01	3.864E-02
3.429889E+01	3.94221E+01	1.1318E+00	1.5618E+01	5.3072E-01	1.367E+01	3.615E-02
3.666551E+01	3.94258E+01	9.9964E-01	1.2904E+01	4.9112E-01	1.130E+01	3.381E-02
3.919543E+01	3.94194E+01	8.8302E-01	1.0663E+01	4.5492E-01	9.345E+00	3.163E-02
4.189992E+01	3.94068E+01	7.8007E-01	8.8118E+00	4.2190E-01	7.725E+00	2.959E-02
4.479101E+01	3.93903E+01	6.8916E-01	7.2824E+00	3.9181E-01	6.386E+00	2.768E-02
4.788159E+01	3.93712E+01	6.0881E-01	6.0182E+00	3.6443E-01	5.279E+00	2.589E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
5.118542E+01	3.93507E+01	5.3780E-01	4.9730E+00	3.3954E-01	4.364E+00	2.422E-02
5.471721E+01	3.93296E+01	4.7479E-01	4.1070E+00	3.1694E-01	3.608E+00	2.266E-02
5.849270E+01	3.93082E+01	4.1920E-01	3.3921E+00	2.9643E-01	2.983E+00	2.120E-02
6.252870E+01	3.92872E+01	3.7014E-01	2.8018E+00	2.7783E-01	2.466E+00	1.983E-02
6.684318E+01	3.92669E+01	3.2684E-01	2.3143E+00	2.6096E-01	2.038E+00	1.855E-02
7.145536E+01	3.92475E+01	2.8863E-01	1.9118E+00	2.4566E-01	1.685E+00	1.735E-02
7.638578E+01	3.92293E+01	2.5432E-01	1.5759E+00	2.3179E-01	1.389E+00	1.623E-02
8.165640E+01	3.92118E+01	2.2342E-01	1.2950E+00	2.1921E-01	1.142E+00	1.518E-02
8.729069E+01	3.91946E+01	1.9588E-01	1.0621E+00	2.0778E-01	9.362E-01	1.420E-02
9.331374E+01	3.91782E+01	1.7174E-01	8.7111E-01	1.9738E-01	7.677E-01	1.329E-02
9.975239E+01	3.91628E+01	1.5058E-01	7.1451E-01	1.8791E-01	6.295E-01	1.243E-02
1.066353E+02	3.91484E+01	1.3204E-01	5.8608E-01	1.7927E-01	5.162E-01	1.163E-02
1.139931E+02	3.91350E+01	1.1579E-01	4.8076E-01	1.7136E-01	4.232E-01	1.088E-02
1.218587E+02	3.91226E+01	1.0154E-01	3.9438E-01	1.6411E-01	3.471E-01	1.017E-02
1.302669E+02	3.91111E+01	8.9045E-02	3.2354E-01	1.5743E-01	2.846E-01	9.518E-03
1.392553E+02	3.91007E+01	7.8093E-02	2.6543E-01	1.5127E-01	2.333E-01	8.903E-03
1.488640E+02	3.90910E+01	6.8490E-02	2.1777E-01	1.4556E-01	1.913E-01	8.329E-03
1.591356E+02	3.90823E+01	6.0071E-02	1.7867E-01	1.4025E-01	1.569E-01	7.791E-03
1.701159E+02	3.90742E+01	5.2689E-02	1.4660E-01	1.3528E-01	1.287E-01	7.288E-03
1.818539E+02	3.90669E+01	4.6215E-02	1.2028E-01	1.3063E-01	1.055E-01	6.818E-03
1.944018E+02	3.90603E+01	4.0538E-02	9.8699E-02	1.2624E-01	8.650E-02	6.378E-03
2.078156E+02	3.90543E+01	3.5560E-02	8.0990E-02	1.2208E-01	7.093E-02	5.966E-03
2.221548E+02	3.90488E+01	3.1194E-02	6.6461E-02	1.1813E-01	5.816E-02	5.581E-03
2.374835E+02	3.90439E+01	2.7365E-02	5.4540E-02	1.1436E-01	4.769E-02	5.221E-03
2.538699E+02	3.90394E+01	2.4007E-02	4.4758E-02	1.1075E-01	3.911E-02	4.884E-03
2.713869E+02	3.90354E+01	2.1062E-02	3.6732E-02	1.0728E-01	3.207E-02	4.569E-03
2.901126E+02	3.90317E+01	1.8478E-02	3.0147E-02	1.0392E-01	2.629E-02	4.274E-03
3.101304E+02	3.90285E+01	1.6212E-02	2.4742E-02	1.0068E-01	2.156E-02	3.998E-03
3.315294E+02	3.90255E+01	1.4224E-02	2.0307E-02	9.7529E-02	1.768E-02	3.740E-03
3.544049E+02	3.90228E+01	1.2480E-02	1.6668E-02	9.4466E-02	1.450E-02	3.498E-03
3.788588E+02	3.90204E+01	1.0951E-02	1.3681E-02	9.1480E-02	1.189E-02	3.273E-03
4.050001E+02	3.90183E+01	9.6090E-03	1.1230E-02	8.8564E-02	9.748E-03	3.061E-03
4.329451E+02	3.90164E+01	8.4317E-03	9.2179E-03	8.5714E-02	7.993E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 305

Zr Z = 40

Atomic weight = 9.122000E+01 g/mol, nominal density ρ (g/cm³) = 6.4940E+00

μ_a (barns/atom) = μ (cm²/g) \times 1.51474E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.61306E+05

13 edges. Edge energies (keV):

K		1.79976E+00	L	I	2.53160E+00	L	II	2.30670E+00	L	III	2.22230E+00
M	I	4.30300E-00	M	II	3.44200E-00	M	III	3.30500E-00	M	IV	1.82400E-01
M	V	1.80000E-00	N	I	5.13000E-02	N	II	2.87000E-02	N	III	2.87000E-02
N	IV	4.02345E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -3.0496E-01, -1.9140E-01 e/atom

Nuclear Thomson correction f_{NT} = -9.6221E-03 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	8.63969E+00	3.7546E+00	1.6202E+05	1.4031E-04	0.000E+00	1.160E+02
1.142761E-02	9.20229E+00	3.8719E+00	1.5630E+05	1.9160E-04	0.000E+00	1.085E+02
1.221612E-02	9.79034E+00	3.8448E+00	1.4519E+05	2.6025E-04	0.000E+00	1.015E+02
1.305903E-02	1.03210E+01	3.6795E+00	1.2998E+05	3.5161E-04	0.000E+00	9.494E+01
1.396010E-02	1.07704E+01	3.3990E+00	1.1232E+05	4.7253E-04	0.000E+00	8.881E+01
1.492335E-02	1.11106E+01	3.0377E+00	9.3901E+04	6.3168E-04	0.000E+00	8.308E+01
1.595306E-02	1.13288E+01	2.6337E+00	7.6157E+04	8.4003E-04	0.000E+00	7.772E+01
1.705382E-02	1.14247E+01	2.2215E+00	6.0092E+04	1.1113E-03	0.000E+00	7.270E+01
1.823053E-02	1.14062E+01	1.8295E+00	4.6295E+04	1.4626E-03	0.000E+00	6.801E+01
1.948844E-02	1.12852E+01	1.4775E+00	3.4973E+04	1.9150E-03	0.000E+00	6.362E+01
2.083314E-02	1.10699E+01	1.1750E+00	2.6017E+04	2.4946E-03	0.000E+00	5.951E+01
2.227063E-02	1.07559E+01	9.2388E-01	1.9137E+04	3.2332E-03	0.000E+00	5.567E+01
2.380730E-02	1.03102E+01	7.2105E-01	1.3972E+04	4.1693E-03	0.000E+00	5.208E+01
2.545001E-02	9.62155E+00	5.6055E-01	1.0161E+04	5.3495E-03	0.000E+00	4.872E+01
2.720606E-02	8.21966E+00	4.3549E-01	7.3841E+03	6.8298E-03	0.000E+00	4.557E+01
2.812600E-02	6.29704E+00	3.8425E-01	6.3023E+03	7.6998E-03	0.000E+00	4.408E+01
2.855650E-02	3.21432E+00	3.6300E-01	5.8640E+03	8.1299E-03	0.000E+00	4.342E+01
2.867130E-02	-5.92300E-01	3.5760E-01	5.7536E+03	8.2472E-03	0.000E+00	4.324E+01
2.884350E-02	3.54960E+00	7.9002E+00	1.2635E+05	8.4250E-03	0.000E+00	4.299E+01
2.908327E-02	6.11659E+00	7.6864E+00	1.2192E+05	8.6766E-03	0.000E+00	4.263E+01
2.927400E-02	7.19898E+00	7.5218E+00	1.1853E+05	8.8801E-03	0.000E+00	4.235E+01
3.109002E-02	1.09926E+01	6.1658E+00	9.1486E+04	1.0969E-02	0.000E+00	3.988E+01
3.232523E-02	1.23938E+01	4.9447E+00	6.8632E+04	1.3799E-02	0.000E+00	3.731E+01
3.552846E-02	1.29928E+01	3.9611E+00	5.1432E+04	1.7275E-02	0.000E+00	3.490E+01
3.797993E-02	1.32238E+01	3.1838E+00	3.8671E+04	2.1522E-02	0.000E+00	3.264E+01
4.060054E-02	1.32621E+01	2.5776E+00	2.9287E+04	2.6686E-02	0.000E+00	3.054E+01
4.340198E-02	1.31953E+01	2.1087E+00	2.2413E+04	3.2933E-02	0.000E+00	2.857E+01
4.639671E-02	1.30678E+01	1.7474E+00	1.7374E+04	4.0449E-02	0.000E+00	2.672E+01
4.959809E-02	1.28901E+01	1.4693E+00	1.3666E+04	4.9449E-02	0.000E+00	2.500E+01
5.027400E-02	1.28410E+01	1.4213E+00	1.3041E+04	5.1476E-02	0.000E+00	2.466E+01
5.104350E-02	1.27552E+01	1.3703E+00	1.2384E+04	5.3838E-02	0.000E+00	2.429E+01
5.124870E-02	1.26876E+01	1.3573E+00	1.2217E+04	5.4478E-02	0.000E+00	2.419E+01
5.155650E-02	1.27297E+01	1.4517E+00	1.2989E+04	5.5445E-02	0.000E+00	2.405E+01
5.232600E-02	1.27431E+01	1.4103E+00	1.2433E+04	5.7903E-02	0.000E+00	2.369E+01
5.302035E-02	1.27301E+01	1.3757E+00	1.1970E+04	6.0170E-02	0.000E+00	2.338E+01
5.667876E-02	1.26150E+01	1.2296E+00	1.0007E+04	7.2877E-02	0.000E+00	2.187E+01
6.058959E-02	1.24840E+01	1.1224E+00	8.5458E+03	8.7863E-02	0.000E+00	2.046E+01
6.477028E-02	1.23506E+01	1.0443E+00	7.4379E+03	1.0545E-01	0.000E+00	1.914E+01
6.923942E-02	1.22161E+01	9.8836E-01	6.5849E+03	1.2598E-01	0.000E+00	1.791E+01
7.401695E-02	1.20790E+01	9.4929E-01	5.9164E+03	1.4984E-01	0.000E+00	1.675E+01
7.912411E-02	1.19368E+01	9.2428E-01	5.3887E+03	1.7742E-01	0.000E+00	1.567E+01
8.458368E-02	1.17864E+01	9.0958E-01	4.9607E+03	2.0915E-01	0.000E+00	1.466E+01
9.041995E-02	1.16299E+01	9.0237E-01	4.6037E+03	2.4546E-01	0.000E+00	1.371E+01
9.665893E-02	1.14486E+01	9.0088E-01	4.2995E+03	2.8683E-01	0.000E+00	1.283E+01
1.033284E-01	1.12422E+01	9.0376E-01	4.0348E+03	3.3373E-01	0.000E+00	1.200E+01
1.104581E-01	1.10023E+01	9.0996E-01	3.8003E+03	3.8662E-01	0.000E+00	1.122E+01
1.180797E-01	1.07172E+01	9.1865E-01	3.5889E+03	4.4598E-01	0.000E+00	1.050E+01
1.262272E-01	1.03714E+01	9.2912E-01	3.3955E+03	5.1229E-01	0.000E+00	9.822E+00
1.349368E-01	9.94174E+00	9.4071E-01	3.2160E+03	5.8598E-01	0.000E+00	9.188E+00
1.442475E-01	9.39145E+00	9.5287E-01	3.0473E+03	6.6748E-01	0.000E+00	8.595E+00
1.542005E-01	8.65667E+00	9.6510E-01	2.8872E+03	7.5718E-01	0.000E+00	8.040E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.648404E-01	7.59071E+00	9.7697E-01	2.7340E+03	8.5541E-01	0.000E+00	7.521E+00
1.762144E-01	5.62572E+00	9.8807E-01	2.5866E+03	9.6245E-01	0.000E+00	7.036E+00
1.764000E-01	5.57321E+00	9.8824E-01	2.5844E+03	9.6421E-01	0.000E+00	7.029E+00
1.787520E-01	4.67369E+00	9.9032E-01	2.5557E+03	9.8656E-01	0.000E+00	6.936E+00
1.791000E-01	4.45684E+00	9.9062E-01	2.5515E+03	9.8987E-01	0.000E+00	6.923E+00
1.798200E-01	3.60635E+00	9.9124E-01	2.5429E+03	9.9672E-01	0.000E+00	6.895E+00
1.809000E-01	3.89674E+00	2.3162E+00	5.9064E+03	1.0070E+00	0.000E+00	6.854E+00
1.814880E-01	3.85670E+00	2.3505E+00	5.9744E+03	1.0126E+00	0.000E+00	6.832E+00
1.822176E-01	3.43839E+00	2.3941E+00	6.0608E+03	1.0196E+00	0.000E+00	6.804E+00
1.833120E-01	3.83947E+00	3.3624E+00	8.4616E+03	1.0300E+00	0.000E+00	6.764E+00
1.836000E-01	3.89979E+00	3.3916E+00	8.5217E+03	1.0328E+00	0.000E+00	6.753E+00
1.860480E-01	4.02739E+00	3.6524E+00	9.0560E+03	1.0562E+00	0.000E+00	6.664E+00
1.883732E-01	3.95244E+00	3.9221E+00	9.6048E+03	1.0785E+00	0.000E+00	6.582E+00
2.013709E-01	3.06524E+00	5.8955E+00	1.3506E+04	1.2037E+00	0.000E+00	6.157E+00
2.152655E-01	2.61432E+00	8.5578E+00	1.8339E+04	1.3382E+00	0.000E+00	5.760E+00
2.301188E-01	2.94879E+00	1.1475E+01	2.3003E+04	1.4818E+00	0.000E+00	5.388E+00
2.459970E-01	4.10791E+00	1.4289E+01	2.6796E+04	1.6343E+00	0.000E+00	5.040E+00
2.629708E-01	5.95134E+00	1.6688E+01	2.9274E+04	1.7957E+00	0.000E+00	4.715E+00
2.811158E-01	8.21365E+00	1.8468E+01	3.0306E+04	1.9653E+00	0.000E+00	4.410E+00
3.005128E-01	1.05480E+01	1.9558E+01	3.0022E+04	2.1428E+00	0.000E+00	4.126E+00
3.212482E-01	1.23356E+01	1.9988E+01	2.8702E+04	2.3275E+00	0.000E+00	3.859E+00
3.238900E-01	1.24034E+01	2.0000E+01	2.8485E+04	2.3506E+00	0.000E+00	3.828E+00
3.288475E-01	1.19981E+01	2.0000E+01	2.8056E+04	2.3938E+00	0.000E+00	3.770E+00
3.301695E-01	1.10640E+01	1.9996E+01	2.7937E+04	2.4053E+00	0.000E+00	3.755E+00
3.321525E-01	1.22979E+01	2.2058E+01	3.0635E+04	2.4224E+00	0.000E+00	3.733E+00
3.373160E-01	1.36414E+01	2.2040E+01	3.0142E+04	2.4668E+00	0.000E+00	3.676E+00
3.424790E-01	1.41694E+01	2.1998E+01	2.9631E+04	2.5107E+00	0.000E+00	3.620E+00
3.434143E-01	1.40923E+01	2.1989E+01	2.9537E+04	2.5187E+00	0.000E+00	3.610E+00
3.438558E-01	1.39242E+01	2.1984E+01	2.9493E+04	2.5224E+00	0.000E+00	3.606E+00
3.459210E-01	1.46887E+01	2.2860E+01	3.0485E+04	2.5399E+00	0.000E+00	3.584E+00
3.510840E-01	1.57956E+01	2.2798E+01	2.9955E+04	2.5832E+00	0.000E+00	3.531E+00
3.671099E-01	1.80251E+01	2.2504E+01	2.8278E+04	2.7154E+00	0.000E+00	3.377E+00
3.924405E-01	2.05907E+01	2.1810E+01	2.5637E+04	2.9168E+00	0.000E+00	3.159E+00
4.195189E-01	2.24759E+01	2.0892E+01	2.2973E+04	3.1216E+00	0.000E+00	2.955E+00
4.216940E-01	2.25688E+01	2.0814E+01	2.2769E+04	3.1376E+00	0.000E+00	2.940E+00
4.281485E-01	2.26184E+01	2.0580E+01	2.2174E+04	3.1847E+00	0.000E+00	2.896E+00
4.298697E-01	2.22665E+01	2.0518E+01	2.2018E+04	3.1971E+00	0.000E+00	2.884E+00
4.324515E-01	2.29066E+01	2.1338E+01	2.2762E+04	3.2157E+00	0.000E+00	2.867E+00
4.389060E-01	2.37239E+01	2.1102E+01	2.2179E+04	3.2617E+00	0.000E+00	2.825E+00
4.484657E-01	2.45159E+01	2.0752E+01	2.1346E+04	3.3288E+00	0.000E+00	2.765E+00
4.794098E-01	2.63946E+01	1.9628E+01	1.8887E+04	3.5370E+00	0.000E+00	2.586E+00
5.124891E-01	2.78803E+01	1.8475E+01	1.6629E+04	3.7449E+00	0.000E+00	2.419E+00
5.478508E-01	2.91158E+01	1.7321E+01	1.4584E+04	3.9511E+00	0.000E+00	2.263E+00
5.856525E-01	3.01279E+01	1.6183E+01	1.2747E+04	4.1541E+00	0.000E+00	2.117E+00
6.260625E-01	3.09657E+01	1.5083E+01	1.1114E+04	4.3524E+00	0.000E+00	1.980E+00
6.692609E-01	3.16583E+01	1.4029E+01	9.6697E+03	4.5447E+00	0.000E+00	1.853E+00
7.154399E-01	3.22301E+01	1.3025E+01	8.3981E+03	4.7293E+00	0.000E+00	1.733E+00
7.648052E-01	3.26986E+01	1.2066E+01	7.2777E+03	4.9050E+00	0.000E+00	1.621E+00
8.175768E-01	3.30705E+01	1.1155E+01	6.2940E+03	5.0703E+00	0.000E+00	1.516E+00
8.739896E-01	3.33583E+01	1.0297E+01	5.4351E+03	5.2240E+00	0.000E+00	1.419E+00
9.342948E-01	3.35740E+01	9.4945E+00	4.6879E+03	5.3648E+00	0.000E+00	1.327E+00
9.987612E-01	3.37337E+01	8.7469E+00	4.0400E+03	5.4916E+00	0.000E+00	1.241E+00
1.067676E+00	3.38779E+01	7.9335E+00	3.4278E+03	5.6036E+00	0.000E+00	1.161E+00
1.141345E+00	3.38850E+01	7.2000E+00	2.9101E+03	5.6998E+00	0.000E+00	1.086E+00
1.220098E+00	3.38089E+01	6.5408E+00	2.4730E+03	5.7795E+00	0.000E+00	1.016E+00
1.304285E+00	3.36698E+01	5.9490E+00	2.1041E+03	5.8423E+00	0.000E+00	9.506E-01
1.394281E+00	3.34666E+01	5.3904E+00	1.7835E+03	5.8877E+00	0.000E+00	8.892E-01
1.490486E+00	3.31750E+01	4.8740E+00	1.5085E+03	5.9155E+00	0.000E+00	8.318E-01
1.593329E+00	3.27836E+01	4.4137E+00	1.2779E+03	5.9257E+00	0.000E+00	7.781E-01
1.703269E+00	3.22630E+01	4.0029E+00	1.0841E+03	5.9185E+00	0.000E+00	7.279E-01
1.820795E+00	3.15430E+01	3.6307E+00	9.1986E+02	5.8939E+00	0.000E+00	6.809E-01
1.946430E+00	3.04556E+01	3.2965E+00	7.8128E+02	5.8526E+00	0.000E+00	6.370E-01
2.080733E+00	2.84688E+01	2.9969E+00	6.6443E+02	5.7950E+00	0.000E+00	5.959E-01
2.177854E+00	2.50258E+01	2.8100E+00	5.9520E+02	5.7466E+00	0.000E+00	5.693E-01
2.211189E+00	2.10778E+01	2.7507E+00	5.7386E+02	5.7289E+00	0.000E+00	5.607E-01

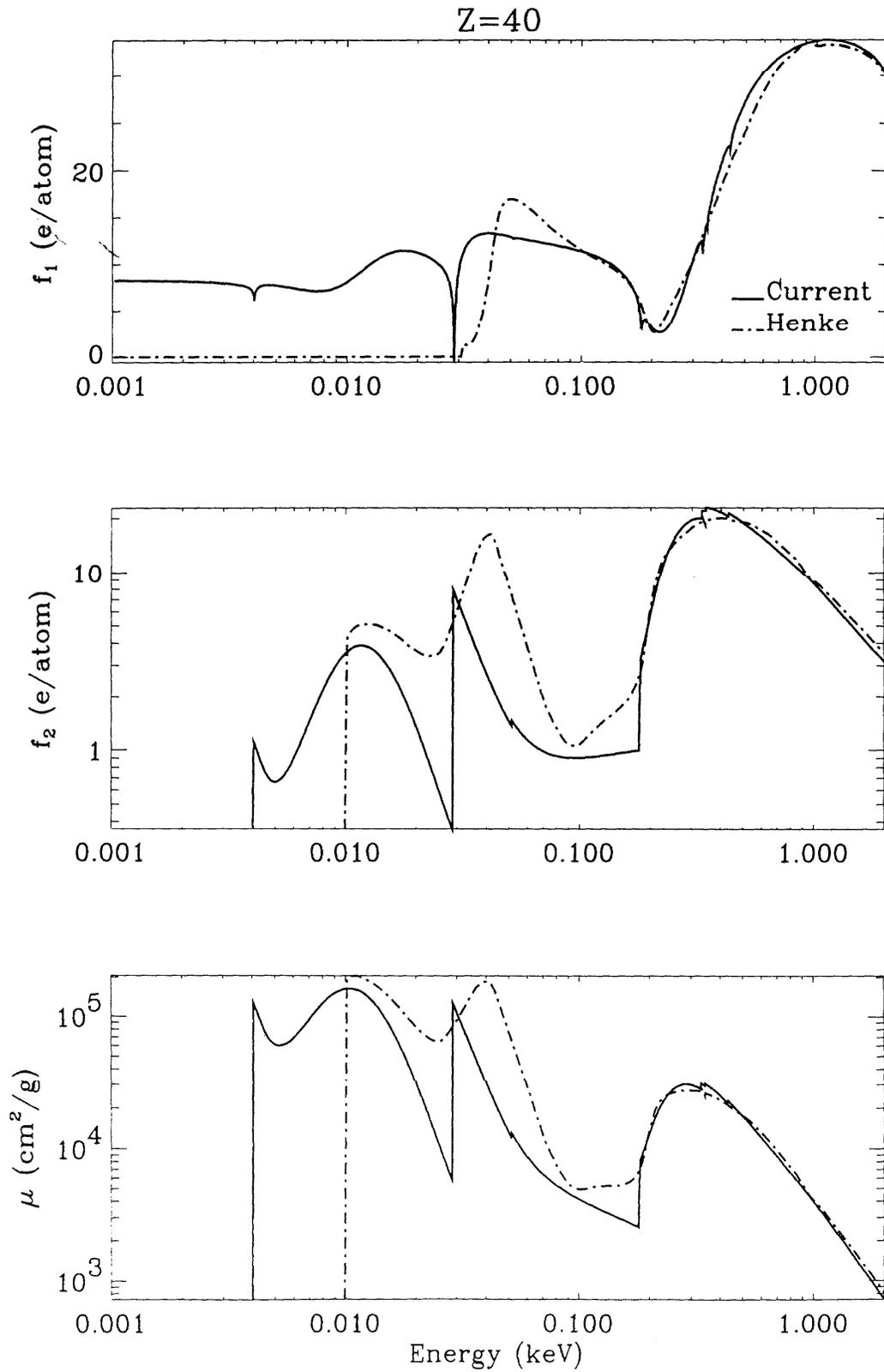
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 307

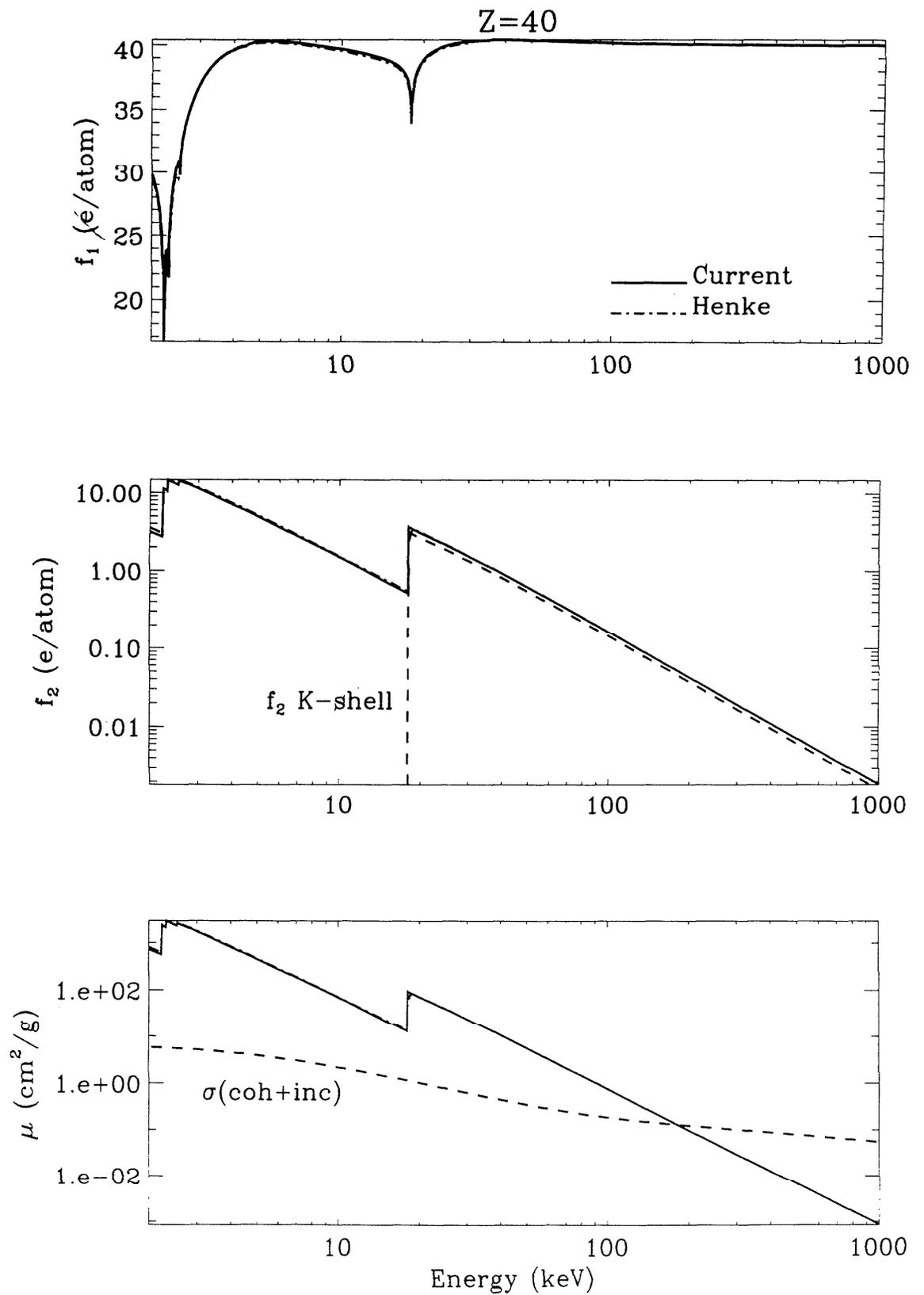
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.220078E+00	1.66305E+01	2.7353E+00	5.6836E+02	5.7241E+00	0.000E+00	5.585E-01
2.224304E+00	1.62010E+01	1.1335E+01	2.3508E+03	5.7218E+00	0.000E+00	5.574E-01
2.233412E+00	2.08476E+01	1.1245E+01	2.3226E+03	5.7169E+00	0.000E+00	5.551E-01
2.260566E+00	2.38230E+01	1.0983E+01	2.2413E+03	5.7018E+00	0.000E+00	5.485E-01
2.266746E+00	2.40772E+01	1.0925E+01	2.2234E+03	5.6984E+00	0.000E+00	5.470E-01
2.295166E+00	2.39079E+01	1.0663E+01	2.1432E+03	5.6823E+00	0.000E+00	5.402E-01
2.304393E+00	2.21098E+01	1.0581E+01	2.1181E+03	5.6770E+00	0.000E+00	5.380E-01
2.318233E+00	2.47235E+01	1.4670E+01	2.9191E+03	5.6690E+00	0.000E+00	5.348E-01
2.352834E+00	2.75108E+01	1.4271E+01	2.7981E+03	5.6487E+00	0.000E+00	5.270E-01
2.377781E+00	2.85758E+01	1.4007E+01	2.7174E+03	5.6339E+00	0.000E+00	5.214E-01
2.480968E+00	3.07315E+01	1.3041E+01	2.4248E+03	5.5706E+00	0.000E+00	4.997E-01
2.518942E+00	3.05892E+01	1.2728E+01	2.3310E+03	5.5467E+00	0.000E+00	4.922E-01
2.529068E+00	2.97840E+01	1.2648E+01	2.3070E+03	5.5402E+00	0.000E+00	4.902E-01
2.541848E+00	3.08105E+01	1.4446E+01	2.6218E+03	5.5321E+00	0.000E+00	4.878E-01
2.544258E+00	3.09762E+01	1.4426E+01	2.6156E+03	5.5306E+00	0.000E+00	4.873E-01
2.582232E+00	3.23607E+01	1.4114E+01	2.5214E+03	5.5061E+00	0.000E+00	4.801E-01
2.717235E+00	3.45926E+01	1.3113E+01	2.2262E+03	5.4174E+00	0.000E+00	4.563E-01
2.904724E+00	3.63503E+01	1.1927E+01	1.8941E+03	5.2910E+00	0.000E+00	4.268E-01
3.105150E+00	3.75776E+01	1.0765E+01	1.5993E+03	5.1539E+00	0.000E+00	3.993E-01
3.319406E+00	3.84098E+01	9.6735E+00	1.3444E+03	5.0073E+00	0.000E+00	3.735E-01
3.548443E+00	3.89875E+01	8.6866E+00	1.1293E+03	4.8525E+00	0.000E+00	3.494E-01
3.793288E+00	3.93928E+01	7.8053E+00	9.4921E+02	4.6907E+00	0.000E+00	3.269E-01
4.055024E+00	3.96799E+01	7.0192E+00	7.9851E+02	4.5230E+00	0.000E+00	3.058E-01
4.334821E+00	3.98855E+01	6.3175E+00	6.7230E+02	4.3506E+00	0.000E+00	2.860E-01
4.633924E+00	4.01747E+01	5.6673E+00	5.6418E+02	4.1749E+00	0.000E+00	2.676E-01
4.953664E+00	4.02531E+01	5.0616E+00	4.7136E+02	3.9968E+00	0.000E+00	2.503E-01
5.295467E+00	4.03220E+01	4.5149E+00	3.9331E+02	3.8175E+00	0.000E+00	2.341E-01
5.660855E+00	4.03110E+01	4.0262E+00	3.2810E+02	3.6380E+00	0.000E+00	2.190E-01
6.051453E+00	4.02733E+01	3.5936E+00	2.7394E+02	3.4593E+00	0.000E+00	2.049E-01
6.469004E+00	4.02179E+01	3.2086E+00	2.2881E+02	3.2822E+00	0.000E+00	1.917E-01
6.915365E+00	4.01495E+01	2.8651E+00	1.9113E+02	3.1077E+00	0.000E+00	1.793E-01
7.392525E+00	4.00724E+01	2.5609E+00	1.5980E+02	2.9364E+00	0.000E+00	1.677E-01
7.902609E+00	3.99904E+01	2.2911E+00	1.3374E+02	2.7689E+00	0.000E+00	1.569E-01
8.447890E+00	3.99071E+01	2.0510E+00	1.1200E+02	2.6060E+00	0.000E+00	1.468E-01
9.030794E+00	3.98312E+01	1.8332E+00	9.3641E+01	2.4480E+00	0.000E+00	1.373E-01
9.653919E+00	3.97383E+01	1.6261E+00	7.7700E+01	2.2955E+00	0.000E+00	1.284E-01
1.032004E+01	3.96345E+01	1.4376E+00	6.4262E+01	2.1487E+00	0.000E+00	1.201E-01
1.103212E+01	3.95203E+01	1.2709E+00	5.3142E+01	2.0079E+00	0.000E+00	1.124E-01
1.179334E+01	3.93936E+01	1.1197E+00	4.3798E+01	1.8734E+00	0.000E+00	1.051E-01
1.260708E+01	3.92506E+01	9.8744E-01	3.6131E+01	1.7452E+00	0.000E+00	9.834E-02
1.347697E+01	3.90847E+01	8.7156E-01	2.9833E+01	1.6235E+00	0.000E+00	9.200E-02
1.440688E+01	3.88813E+01	7.6995E-01	2.4654E+01	1.5083E+00	0.000E+00	8.606E-02
1.540095E+01	3.86073E+01	6.8082E-01	2.0393E+01	1.3996E+00	0.000E+00	8.050E-02
1.646362E+01	3.81655E+01	6.0256E-01	1.6884E+01	1.2973E+00	0.000E+00	7.531E-02
1.759961E+01	3.69666E+01	5.3379E-01	1.3991E+01	1.2012E+00	0.000E+00	7.045E-02
1.763765E+01	3.68730E+01	5.3171E-01	1.3907E+01	1.1982E+00	0.000E+00	7.030E-02
1.790761E+01	3.55375E+01	5.1731E-01	1.3326E+01	1.1772E+00	0.000E+00	6.924E-02
1.797960E+01	3.39278E+01	5.1357E-01	1.3177E+01	1.1718E+00	0.000E+00	6.896E-02
1.808759E+01	3.55694E+01	3.6815E+00	9.3892E+01	1.1636E+00	8.094E+01	6.855E-02
1.835755E+01	3.70539E+01	3.5783E+00	8.9920E+01	1.1437E+00	7.749E+01	6.754E-02
1.881398E+01	3.79492E+01	3.4138E+00	8.3703E+01	1.1113E+00	7.210E+01	6.590E-02
2.011215E+01	3.89585E+01	3.0491E+00	6.9936E+01	1.0273E+00	6.030E+01	6.165E-02
2.149988E+01	3.94548E+01	2.7406E+00	5.8803E+01	9.4915E-01	5.080E+01	5.767E-02
2.298338E+01	3.97696E+01	2.4665E+00	4.9506E+01	8.7651E-01	4.285E+01	5.395E-02
2.456923E+01	3.99873E+01	2.2109E+00	4.1511E+01	8.0919E-01	3.597E+01	5.046E-02
2.626450E+01	4.01362E+01	1.9773E+00	3.4728E+01	7.4693E-01	3.011E+01	4.721E-02
2.807676E+01	4.02404E+01	1.7610E+00	2.8934E+01	6.8948E-01	2.513E+01	4.416E-02
3.001405E+01	4.03063E+01	1.5667E+00	2.4079E+01	6.3658E-01	2.096E+01	4.131E-02
3.208502E+01	4.03483E+01	1.3939E+00	2.0041E+01	5.8797E-01	1.748E+01	3.864E-02
3.429889E+01	4.03736E+01	1.2404E+00	1.6682E+01	5.4338E-01	1.457E+01	3.615E-02
3.666551E+01	4.04228E+01	1.1015E+00	1.3859E+01	5.0255E-01	1.212E+01	3.381E-02
3.919543E+01	4.04242E+01	9.7302E-01	1.1452E+01	4.6524E-01	1.002E+01	3.163E-02
4.189992E+01	4.04164E+01	8.5957E-01	9.4637E+00	4.3118E-01	8.285E+00	2.959E-02
4.479101E+01	4.04028E+01	7.5942E-01	7.8213E+00	4.0015E-01	6.850E+00	2.768E-02
4.788159E+01	4.03857E+01	6.7097E-01	6.4643E+00	3.7190E-01	5.663E+00	2.589E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
5.118542E+01	4.03663E+01	5.9279E-01	5.3425E+00	3.4622E-01	4.682E+00	2.422E-02
5.471721E+01	4.03456E+01	5.2368E-01	4.4150E+00	3.2290E-01	3.870E+00	2.266E-02
5.849270E+01	4.03244E+01	4.6240E-01	3.6467E+00	3.0174E-01	3.200E+00	2.120E-02
6.252870E+01	4.03032E+01	4.0832E-01	3.0124E+00	2.8254E-01	2.645E+00	1.983E-02
6.684318E+01	4.02823E+01	3.6059E-01	2.4885E+00	2.6513E-01	2.187E+00	1.855E-02
7.145536E+01	4.02622E+01	3.1845E-01	2.0559E+00	2.4934E-01	1.808E+00	1.735E-02
7.638578E+01	4.02432E+01	2.8126E-01	1.6986E+00	2.3503E-01	1.495E+00	1.623E-02
8.165640E+01	4.02252E+01	2.4752E-01	1.3983E+00	2.2204E-01	1.231E+00	1.518E-02
8.729069E+01	4.02075E+01	2.1714E-01	1.1475E+00	2.1025E-01	1.010E+00	1.420E-02
9.331374E+01	4.01904E+01	1.9051E-01	9.4179E-01	1.9953E-01	8.285E-01	1.329E-02
9.975239E+01	4.01742E+01	1.6714E-01	7.7296E-01	1.8976E-01	6.798E-01	1.243E-02
1.066353E+02	4.01590E+01	1.4666E-01	6.3443E-01	1.8086E-01	5.578E-01	1.163E-02
1.139931E+02	4.01449E+01	1.2868E-01	5.2075E-01	1.7272E-01	4.577E-01	1.088E-02
1.218587E+02	4.01318E+01	1.1292E-01	4.2747E-01	1.6525E-01	3.755E-01	1.017E-02
1.302669E+02	4.01196E+01	9.9091E-02	3.5090E-01	1.5839E-01	3.081E-01	9.518E-03
1.392553E+02	4.01085E+01	8.6960E-02	2.8807E-01	1.5207E-01	2.528E-01	8.903E-03
1.488640E+02	4.00982E+01	7.6317E-02	2.3649E-01	1.4621E-01	2.074E-01	8.329E-03
1.591356E+02	4.00888E+01	6.6979E-02	1.9416E-01	1.4077E-01	1.702E-01	7.791E-03
1.701159E+02	4.00803E+01	5.8786E-02	1.5941E-01	1.3569E-01	1.397E-01	7.288E-03
1.818539E+02	4.00724E+01	5.1598E-02	1.3089E-01	1.3093E-01	1.146E-01	6.818E-03
1.944018E+02	4.00653E+01	4.5290E-02	1.0747E-01	1.2645E-01	9.402E-02	6.378E-03
2.078156E+02	4.00588E+01	3.9755E-02	8.8246E-02	1.2222E-01	7.715E-02	5.966E-03
2.221548E+02	4.00530E+01	3.4897E-02	7.2464E-02	1.1821E-01	6.330E-02	5.581E-03
2.374835E+02	4.00477E+01	3.0634E-02	5.9506E-02	1.1439E-01	5.194E-02	5.221E-03
2.538699E+02	4.00428E+01	2.6893E-02	4.8867E-02	1.1073E-01	4.262E-02	4.884E-03
2.713869E+02	4.00385E+01	2.3609E-02	4.0131E-02	1.0722E-01	3.497E-02	4.569E-03
2.901126E+02	4.00346E+01	2.0727E-02	3.2959E-02	1.0384E-01	2.869E-02	4.274E-03
3.101304E+02	4.00310E+01	1.8198E-02	2.7069E-02	1.0057E-01	2.354E-02	3.998E-03
3.315294E+02	4.00278E+01	1.5978E-02	2.2232E-02	9.7404E-02	1.932E-02	3.740E-03
3.544049E+02	4.00249E+01	1.4029E-02	1.8260E-02	9.4330E-02	1.585E-02	3.498E-03
3.788588E+02	4.00223E+01	1.2318E-02	1.4998E-02	9.1338E-02	1.300E-02	3.273E-03
4.050001E+02	4.00200E+01	1.0816E-02	1.2319E-02	8.8421E-02	1.067E-02	3.061E-03
4.329451E+02	4.00179E+01	9.4972E-03	1.0119E-02	8.5572E-02	8.755E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 311

Nb Z = 41

atomic weight = 9.290640E+01 g/mol, nominal density ρ (g/cm³) = 8.5500E+00

$\mu_{\text{ph}}(\text{barns/atom}) = \mu(\text{cm}^2/\text{g}) \times 1.54275E+02$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 4.52932E+05$

edges. Edge energies (keV):

K		1.89856E+00	L	I	2.69770E+00	L	II	2.46470E+00	L	III	2.37050E+00
M	I	4.68400E-00	M	II	3.78400E-00	M	III	3.63000E-00	M	IV	2.07400E-01
N	V	2.04600E-00	N	I	5.81000E-02	N	II	3.39000E-02	N	III	3.39000E-02
	IV	3.20000E-03									

relativistic correction estimate $f_{\text{rel}}(\text{H82,3/5CL}) = -3.2408E-01$, $-2.0280E-01$ e/atom

nuclear Thomson correction $f_{\text{NT}} = -9.9257E-03$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	1.00659E+01	4.4264E+00	1.8754E+05	1.7617E-04	0.000E+00	1.160E+02
1.142761E-02	1.05322E+01	4.2928E+00	1.7014E+05	2.3941E-04	0.000E+00	1.085E+02
1.221612E-02	1.09518E+01	4.0896E+00	1.5163E+05	3.2363E-04	0.000E+00	1.015E+02
1.305903E-02	1.13120E+01	3.8319E+00	1.3290E+05	4.3519E-04	0.000E+00	9.494E+01
1.396010E-02	1.16045E+01	3.5347E+00	1.1468E+05	5.8216E-04	0.000E+00	8.881E+01
1.492335E-02	1.18247E+01	3.2159E+00	9.7604E+04	7.7472E-04	0.000E+00	8.308E+01
1.595306E-02	1.19742E+01	2.8920E+00	8.2109E+04	1.0257E-03	0.000E+00	7.772E+01
1.705382E-02	1.20579E+01	2.5762E+00	6.8422E+04	1.3509E-03	0.000E+00	7.270E+01
1.823053E-02	1.20820E+01	2.2779E+00	5.6593E+04	1.7703E-03	0.000E+00	6.801E+01
1.948844E-02	1.20526E+01	2.0030E+00	4.6553E+04	2.3081E-03	0.000E+00	6.362E+01
2.083314E-02	1.19742E+01	1.7549E+00	3.8153E+04	2.9942E-03	0.000E+00	5.951E+01
2.227063E-02	1.18479E+01	1.5345E+00	3.1207E+04	3.8649E-03	0.000E+00	5.567E+01
2.380730E-02	1.16699E+01	1.3411E+00	2.5514E+04	4.9640E-03	0.000E+00	5.208E+01
2.545001E-02	1.14272E+01	1.1731E+00	2.0877E+04	6.3442E-03	0.000E+00	4.872E+01
2.720606E-02	1.10887E+01	1.0283E+00	1.7119E+04	8.0684E-03	0.000E+00	4.557E+01
2.908327E-02	1.05769E+01	9.0410E-01	1.4080E+04	1.0211E-02	0.000E+00	4.263E+01
3.109002E-02	9.64960E+00	7.9807E-01	1.1627E+04	1.2861E-02	0.000E+00	3.988E+01
3.323523E-02	6.61650E+00	7.0772E-01	9.6449E+03	1.6120E-02	0.000E+00	3.731E+01
3.573050E-02	3.18596E+00	6.8959E-01	9.2598E+03	1.6937E-02	0.000E+00	3.676E+01
3.86610E-02	-1.19368E+00	6.8479E-01	9.1585E+03	1.7165E-02	0.000E+00	3.661E+01
4.06950E-02	3.70199E+00	9.4040E+00	1.2502E+04	1.7510E-02	0.000E+00	3.639E+01
4.357800E-02	8.02069E+00	8.8157E+00	1.1548E+05	1.8392E-02	0.000E+00	3.586E+01
4.552846E-02	1.07915E+01	7.8365E+00	9.9903E+04	2.0109E-02	0.000E+00	3.490E+01
4.797993E-02	1.32373E+01	5.8871E+00	7.0207E+04	2.4966E-02	0.000E+00	3.264E+01
4.060054E-02	1.39977E+01	4.5061E+00	5.0270E+04	3.0850E-02	0.000E+00	3.054E+01
4.340198E-02	1.42144E+01	3.5327E+00	3.6867E+04	3.7943E-02	0.000E+00	2.857E+01
4.639671E-02	1.42065E+01	2.8358E+00	2.7684E+04	4.6449E-02	0.000E+00	2.672E+01
4.959809E-02	1.40978E+01	2.3295E+00	2.1273E+04	5.6600E-02	0.000E+00	2.500E+01
5.302035E-02	1.39394E+01	1.9564E+00	1.6713E+04	6.8654E-02	0.000E+00	2.338E+01
5.667876E-02	1.37336E+01	1.6780E+00	1.3409E+04	8.2895E-02	0.000E+00	2.187E+01
5.693800E-02	1.37147E+01	1.6617E+00	1.3219E+04	8.3957E-02	0.000E+00	2.178E+01
5.780950E-02	1.36248E+01	1.6096E+00	1.2611E+04	8.7577E-02	0.000E+00	2.145E+01
5.804190E-02	1.35549E+01	1.5964E+00	1.2458E+04	8.8555E-02	0.000E+00	2.136E+01
5.839050E-02	1.35974E+01	1.6935E+00	1.3137E+04	9.0033E-02	0.000E+00	2.123E+01
5.926200E-02	1.36097E+01	1.6519E+00	1.2625E+04	9.3781E-02	0.000E+00	2.092E+01
6.058959E-02	1.35818E+01	1.5957E+00	1.1929E+04	9.9639E-02	0.000E+00	2.046E+01
6.477028E-02	1.34584E+01	1.4641E+00	1.0239E+04	1.1923E-01	0.000E+00	1.914E+01
6.923942E-02	1.33287E+01	1.3708E+00	8.9672E+03	1.4203E-01	0.000E+00	1.791E+01
7.401695E-02	1.32008E+01	1.3053E+00	7.9874E+03	1.6845E-01	0.000E+00	1.675E+01
7.912411E-02	1.30742E+01	1.2606E+00	7.2162E+03	1.9890E-01	0.000E+00	1.567E+01
8.458368E-02	1.29466E+01	1.2317E+00	6.5954E+03	2.3383E-01	0.000E+00	1.466E+01
9.041995E-02	1.28148E+01	1.2146E+00	6.0840E+03	2.7371E-01	0.000E+00	1.371E+01
9.665893E-02	1.26746E+01	1.2064E+00	5.6530E+03	3.1901E-01	0.000E+00	1.283E+01
1.033284E-01	1.25133E+01	1.2049E+00	5.2818E+03	3.7022E-01	0.000E+00	1.200E+01
1.104581E-01	1.23409E+01	1.2085E+00	4.9554E+03	4.2783E-01	0.000E+00	1.122E+01
1.180797E-01	1.21424E+01	1.2156E+00	4.6630E+03	4.9234E-01	0.000E+00	1.059E+01
1.262272E-01	1.19086E+01	1.2254E+00	4.3969E+03	5.6420E-01	0.000E+00	9.822E+00
1.349368E-01	1.16273E+01	1.2367E+00	4.1513E+03	6.4388E-01	0.000E+00	9.188E+00
1.442475E-01	1.12817E+01	1.2489E+00	3.9216E+03	7.3179E-01	0.000E+00	8.595E+00
1.542005E-01	1.08466E+01	1.2611E+00	3.7043E+03	8.2832E-01	0.000E+00	8.040E+00
1.648404E-01	1.02823E+01	1.2727E+00	3.4969E+03	9.3379E-01	0.000E+00	7.521E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.762144E-01	9.51839E+00	1.2830E+00	3.2978E+03	1.0485E+00	0.000E+00	7.036E+00
1.883732E-01	8.38955E+00	1.2916E+00	3.1057E+03	1.1725E+00	0.000E+00	6.582E+00
2.005080E-01	6.42876E+00	1.2978E+00	2.9316E+03	1.2972E+00	0.000E+00	6.184E+00
2.013709E-01	6.18902E+00	1.2981E+00	2.9198E+03	1.3061E+00	0.000E+00	6.157E+00
2.032520E-01	5.47097E+00	1.2988E+00	2.8944E+03	1.3255E+00	0.000E+00	6.100E+00
2.035770E-01	5.28557E+00	1.2990E+00	2.8900E+03	1.3288E+00	0.000E+00	6.090E+00
2.043954E-01	4.41950E+00	1.2992E+00	2.8791E+03	1.3372E+00	0.000E+00	6.066E+00
2.056230E-01	4.71064E+00	2.6448E+00	5.8257E+03	1.3499E+00	0.000E+00	6.030E+00
2.063630E-01	4.65902E+00	2.6845E+00	5.8921E+03	1.3575E+00	0.000E+00	6.008E+00
2.071926E-01	4.22092E+00	2.7303E+00	5.9685E+03	1.3661E+00	0.000E+00	5.984E+00
2.084370E-01	4.61993E+00	3.7235E+00	8.0911E+03	1.3789E+00	0.000E+00	5.948E+00
2.086920E-01	4.66799E+00	3.7474E+00	8.1332E+03	1.3815E+00	0.000E+00	5.941E+00
2.115480E-01	4.79309E+00	4.0300E+00	8.6283E+03	1.4109E+00	0.000E+00	5.861E+00
2.152655E-01	4.64634E+00	4.4399E+00	9.3418E+03	1.4492E+00	0.000E+00	5.760E+00
2.301188E-01	3.68255E+00	6.6351E+00	1.3060E+04	1.6017E+00	0.000E+00	5.388E+00
2.459970E-01	3.31170E+00	9.5437E+00	1.7572E+04	1.7634E+00	0.000E+00	5.040E+00
2.629708E-01	3.84660E+00	1.2665E+01	2.1814E+04	1.9341E+00	0.000E+00	4.715E+00
2.811158E-01	5.28323E+00	1.5581E+01	2.5104E+04	2.1132E+00	0.000E+00	4.410E+00
3.005128E-01	7.40735E+00	1.7948E+01	2.7052E+04	2.3003E+00	0.000E+00	4.126E+00
3.212482E-01	9.86435E+00	1.9577E+01	2.7601E+04	2.4945E+00	0.000E+00	3.859E+00
3.434143E-01	1.21514E+01	2.0429E+01	2.6943E+04	2.6952E+00	0.000E+00	3.610E+00
3.557400E-01	1.28368E+01	2.0588E+01	2.6213E+04	2.8035E+00	0.000E+00	3.485E+00
3.611850E-01	1.23859E+01	2.0601E+01	2.5834E+04	2.8506E+00	0.000E+00	3.433E+00
3.626370E-01	1.13570E+01	2.0599E+01	2.5729E+04	2.8631E+00	0.000E+00	3.419E+00
3.648150E-01	1.27166E+01	2.2873E+01	2.8398E+04	2.8818E+00	0.000E+00	3.399E+00
3.671099E-01	1.35048E+01	2.2871E+01	2.8217E+04	2.9014E+00	0.000E+00	3.377E+00
3.702600E-01	1.41594E+01	2.2859E+01	2.7963E+04	2.9281E+00	0.000E+00	3.349E+00
3.708320E-01	1.42535E+01	2.2856E+01	2.7916E+04	2.9329E+00	0.000E+00	3.343E+00
3.765080E-01	1.48151E+01	2.2811E+01	2.7441E+04	2.9807E+00	0.000E+00	3.293E+00
3.780216E-01	1.45420E+01	2.2794E+01	2.7311E+04	2.9933E+00	0.000E+00	3.280E+00
3.802920E-01	1.53787E+01	2.3757E+01	2.8295E+04	3.0122E+00	0.000E+00	3.260E+00
3.859680E-01	1.65851E+01	2.3685E+01	2.7795E+04	3.0591E+00	0.000E+00	3.212E+00
3.924405E-01	1.75798E+01	2.3579E+01	2.7213E+04	3.1119E+00	0.000E+00	3.159E+00
4.195189E-01	2.06793E+01	2.2919E+01	2.4745E+04	3.3258E+00	0.000E+00	2.955E+00
4.484657E-01	2.29922E+01	2.1970E+01	2.2189E+04	3.5416E+00	0.000E+00	2.765E+00
4.590320E-01	2.35572E+01	2.1592E+01	2.1305E+04	3.6172E+00	0.000E+00	2.701E+00
4.660580E-01	2.36325E+01	2.1335E+01	2.0734E+04	3.6665E+00	0.000E+00	2.660E+00
4.679316E-01	2.32794E+01	2.1266E+01	2.0585E+04	3.6795E+00	0.000E+00	2.650E+00
4.707420E-01	2.39415E+01	2.2096E+01	2.1260E+04	3.6990E+00	0.000E+00	2.634E+00
4.777680E-01	2.47959E+01	2.1838E+01	2.0702E+04	3.7470E+00	0.000E+00	2.595E+00
4.794098E-01	2.49438E+01	2.1777E+01	2.0574E+04	3.7582E+00	0.000E+00	2.586E+00
5.124891E-01	2.71205E+01	2.0561E+01	1.8172E+04	3.9740E+00	0.000E+00	2.419E+00
5.478508E-01	2.87590E+01	1.9311E+01	1.5966E+04	4.1876E+00	0.000E+00	2.263E+00
5.856525E-01	3.00837E+01	1.8064E+01	1.3971E+04	4.3975E+00	0.000E+00	2.117E+00
6.260625E-01	3.11435E+01	1.6848E+01	1.2189E+04	4.6021E+00	0.000E+00	1.980E+00
6.692609E-01	3.20317E+01	1.5670E+01	1.0605E+04	4.8001E+00	0.000E+00	1.853E+00
7.154399E-01	3.27381E+01	1.4545E+01	9.2084E+03	4.9898E+00	0.000E+00	1.733E+00
7.648052E-01	3.33512E+01	1.3480E+01	7.9828E+03	5.1699E+00	0.000E+00	1.621E+00
8.175768E-01	3.38339E+01	1.2471E+01	6.9088E+03	5.3388E+00	0.000E+00	1.516E+00
8.739896E-01	3.42181E+01	1.1516E+01	5.9680E+03	5.4954E+00	0.000E+00	1.419E+00
9.342948E-01	3.45185E+01	1.0619E+01	5.1479E+03	5.6384E+00	0.000E+00	1.327E+00
9.987612E-01	3.48154E+01	9.7821E+00	4.4361E+03	5.7667E+00	0.000E+00	1.241E+00
1.067676E+00	3.51027E+01	8.8727E+00	3.7640E+03	5.8793E+00	0.000E+00	1.161E+00
1.141345E+00	3.51326E+01	8.0514E+00	3.1951E+03	5.9755E+00	0.000E+00	1.086E+00
1.220098E+00	3.50842E+01	7.3122E+00	2.7145E+03	6.0545E+00	0.000E+00	1.016E+00
1.304285E+00	3.49759E+01	6.6472E+00	2.3083E+03	6.1158E+00	0.000E+00	9.506E-01
1.394281E+00	3.48140E+01	6.0491E+00	1.9651E+03	6.1591E+00	0.000E+00	8.892E-01
1.490486E+00	3.45998E+01	5.4997E+00	1.6713E+03	6.1841E+00	0.000E+00	8.318E-01
1.593329E+00	3.43066E+01	4.9797E+00	1.4156E+03	6.1910E+00	0.000E+00	7.781E-01
1.703269E+00	3.39135E+01	4.5124E+00	1.1999E+03	6.1797E+00	0.000E+00	7.279E-01
1.820795E+00	3.33913E+01	4.0948E+00	1.0186E+03	6.1507E+00	0.000E+00	6.809E-01
1.946430E+00	3.26700E+01	3.7178E+00	8.6513E+02	6.1043E+00	0.000E+00	6.370E-01
2.080733E+00	3.15783E+01	3.3776E+00	7.3523E+02	6.0412E+00	0.000E+00	5.959E-01
2.224304E+00	2.95666E+01	3.0723E+00	6.2561E+02	5.9621E+00	0.000E+00	5.574E-01
2.323090E+00	2.62700E+01	2.8904E+00	5.6353E+02	5.9024E+00	0.000E+00	5.337E-01

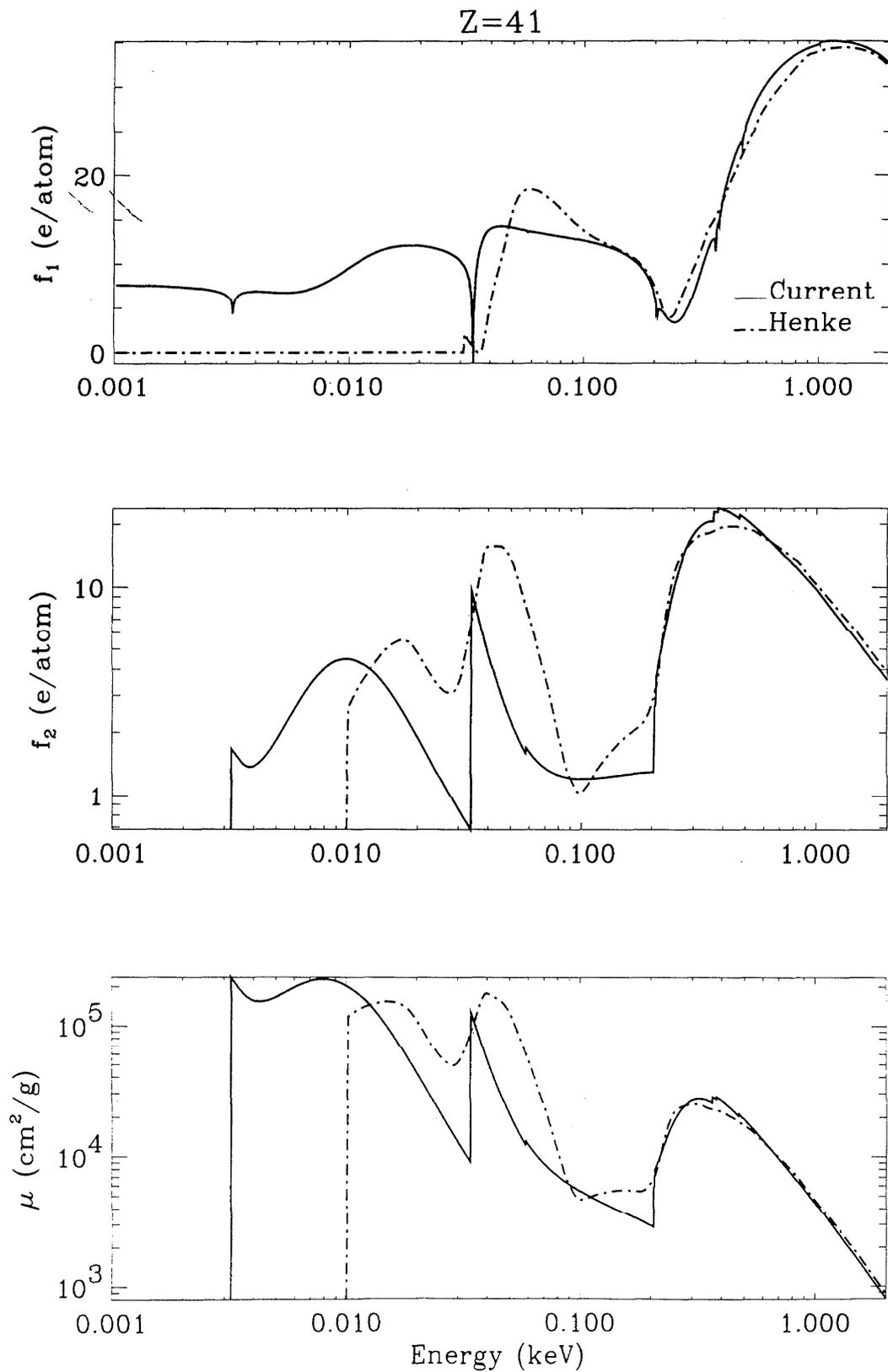
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 313

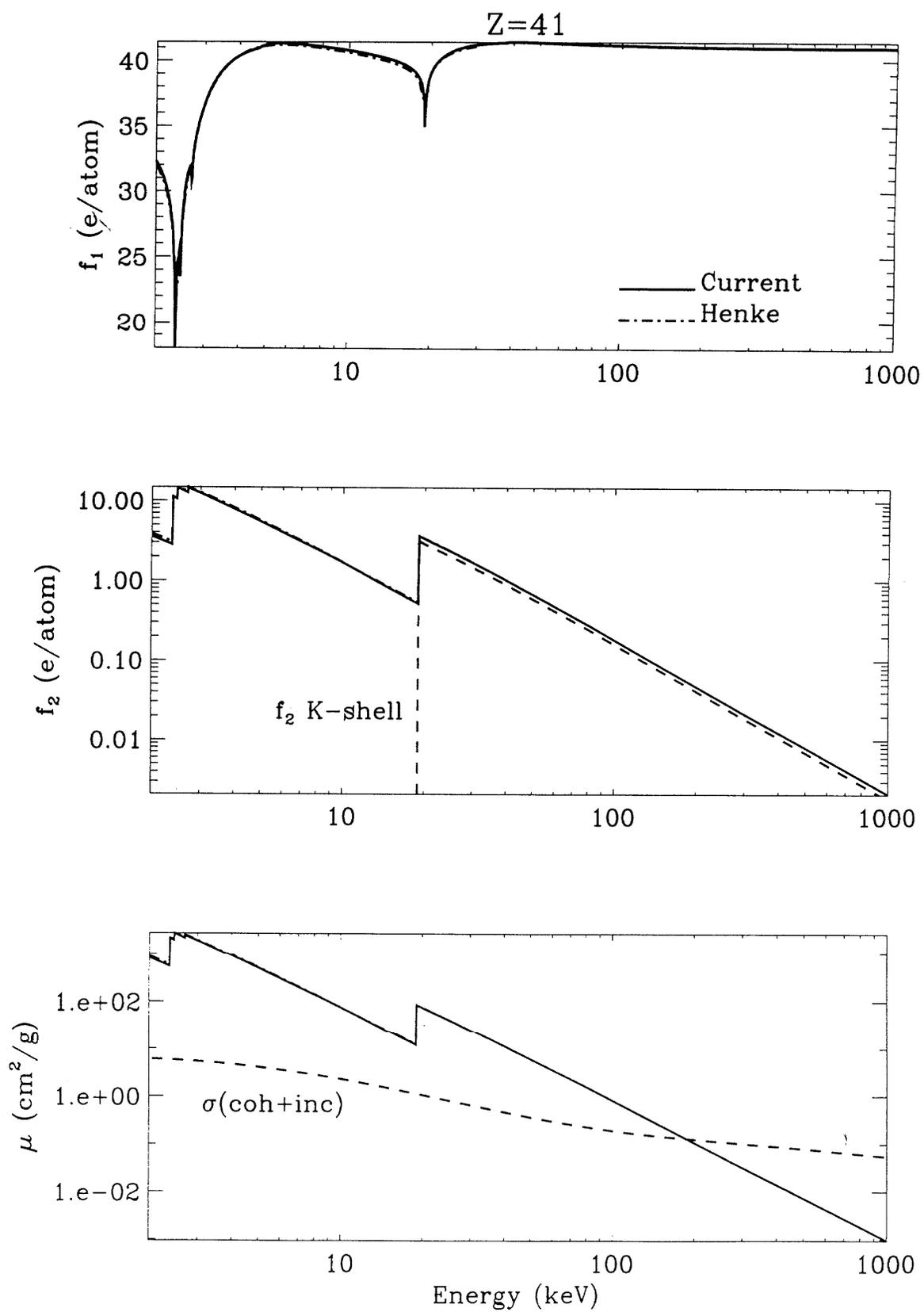
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
2.358648E+00	2.23765E+01	2.8297E+00	5.4338E+02	5.8801E+00	0.000E+00	5.257E-01
2.368130E+00	1.79815E+01	2.8139E+00	5.3819E+02	5.8741E+00	0.000E+00	5.236E-01
2.377781E+00	2.08709E+01	1.1274E+01	2.1476E+03	5.8679E+00	0.000E+00	5.214E-01
2.382353E+00	2.21655E+01	1.1232E+01	2.1354E+03	5.8650E+00	0.000E+00	5.204E-01
2.415406E+00	2.53224E+01	1.0933E+01	2.0501E+03	5.8437E+00	0.000E+00	5.133E-01
2.417910E+00	2.54136E+01	1.0911E+01	2.0438E+03	5.8420E+00	0.000E+00	5.128E-01
2.452376E+00	2.52771E+01	1.0612E+01	1.9600E+03	5.8194E+00	0.000E+00	5.056E-01
2.462235E+00	2.34796E+01	1.0530E+01	1.9369E+03	5.8129E+00	0.000E+00	5.035E-01
2.477023E+00	2.60450E+01	1.4574E+01	2.6650E+03	5.8031E+00	0.000E+00	5.005E-01
2.513994E+00	2.87649E+01	1.4182E+01	2.5551E+03	5.7784E+00	0.000E+00	4.932E-01
2.541848E+00	2.98378E+01	1.3909E+01	2.4784E+03	5.7595E+00	0.000E+00	4.878E-01
2.643746E+00	3.17857E+01	1.3024E+01	2.2314E+03	5.6894E+00	0.000E+00	4.690E-01
2.684212E+00	3.16513E+01	1.2715E+01	2.1456E+03	5.6612E+00	0.000E+00	4.619E-01
2.695002E+00	3.08499E+01	1.2636E+01	2.1236E+03	5.6536E+00	0.000E+00	4.601E-01
2.711189E+00	3.20413E+01	1.4411E+01	2.4074E+03	5.6422E+00	0.000E+00	4.573E-01
2.717235E+00	3.23528E+01	1.4364E+01	2.3943E+03	5.6380E+00	0.000E+00	4.563E-01
2.751654E+00	3.34274E+01	1.4102E+01	2.3213E+03	5.6137E+00	0.000E+00	4.506E-01
2.904724E+00	3.57728E+01	1.3054E+01	2.0355E+03	5.5044E+00	0.000E+00	4.268E-01
3.105150E+00	3.75651E+01	1.1824E+01	1.7247E+03	5.3600E+00	0.000E+00	3.993E-01
3.319406E+00	3.87342E+01	1.0626E+01	1.4500E+03	5.2060E+00	0.000E+00	3.735E-01
3.548445E+00	3.95227E+01	9.5442E+00	1.2182E+03	5.0436E+00	0.000E+00	3.494E-01
3.793288E+00	4.00708E+01	8.5721E+00	1.0235E+03	4.8741E+00	0.000E+00	3.269E-01
4.055024E+00	4.04564E+01	7.7022E+00	8.6031E+02	4.6987E+00	0.000E+00	3.058E-01
4.334821E+00	4.07284E+01	6.9255E+00	7.2362E+02	4.5187E+00	0.000E+00	2.860E-01
4.633924E+00	4.09221E+01	6.2323E+00	6.0916E+02	4.3353E+00	0.000E+00	2.676E-01
4.953664E+00	4.11966E+01	5.5898E+00	5.1109E+02	4.1497E+00	0.000E+00	2.503E-01
5.295467E+00	4.12671E+01	4.9939E+00	4.2714E+02	3.9629E+00	0.000E+00	2.341E-01
5.660855E+00	4.13296E+01	4.4558E+00	3.5652E+02	3.7760E+00	0.000E+00	2.190E-01
6.051453E+00	4.13149E+01	3.9755E+00	2.9756E+02	3.5901E+00	0.000E+00	2.049E-01
6.469004E+00	4.12750E+01	3.5503E+00	2.4857E+02	3.4060E+00	0.000E+00	1.917E-01
6.915365E+00	4.12187E+01	3.1728E+00	2.0781E+02	3.2245E+00	0.000E+00	1.793E-01
7.392525E+00	4.11509E+01	2.8352E+00	1.7371E+02	3.0465E+00	0.000E+00	1.677E-01
7.902609E+00	4.10753E+01	2.5355E+00	1.4532E+02	2.8726E+00	0.000E+00	1.569E-01
8.447890E+00	4.09963E+01	2.2696E+00	1.2168E+02	2.7034E+00	0.000E+00	1.468E-01
9.030794E+00	4.09235E+01	2.0284E+00	1.0173E+02	2.5394E+00	0.000E+00	1.373E-01
9.653919E+00	4.08335E+01	1.7989E+00	8.4401E+01	2.3810E+00	0.000E+00	1.284E-01
1.032004E+01	4.07336E+01	1.5966E+00	7.0071E+01	2.2287E+00	0.000E+00	1.201E-01
1.103212E+01	4.06260E+01	1.4125E+00	5.7992E+01	2.0826E+00	0.000E+00	1.124E-01
1.179334E+01	4.05090E+01	1.2492E+00	4.7978E+01	1.9430E+00	0.000E+00	1.051E-01
1.260708E+01	4.03794E+01	1.1014E+00	3.9569E+01	1.8100E+00	0.000E+00	9.834E-02
1.347697E+01	4.02325E+01	9.7189E-01	3.2663E+01	1.6837E+00	0.000E+00	9.200E-02
1.440688E+01	4.00610E+01	8.5843E-01	2.6988E+01	1.5642E+00	0.000E+00	8.606E-02
1.540095E+01	3.98477E+01	7.5891E-01	2.2319E+01	1.4513E+00	0.000E+00	8.050E-02
1.646362E+01	3.95528E+01	6.7149E-01	1.8473E+01	1.3451E+00	0.000E+00	7.531E-02
1.759961E+01	3.90503E+01	5.9468E-01	1.5304E+01	1.2454E+00	0.000E+00	7.045E-02
1.860589E+01	3.78959E+01	5.3780E-01	1.3092E+01	1.1672E+00	0.000E+00	6.664E-02
1.881398E+01	3.71442E+01	5.2714E-01	1.2690E+01	1.1520E+00	0.000E+00	6.590E-02
1.889067E+01	3.65692E+01	5.2329E-01	1.2547E+01	1.1465E+00	0.000E+00	6.563E-02
1.896661E+01	3.49713E+01	5.1953E-01	1.2407E+01	1.1412E+00	0.000E+00	6.537E-02
1.908053E+01	3.65985E+01	3.6636E+00	8.6967E+01	1.1331E+00	7.477E+01	6.498E-02
1.936531E+01	3.80702E+01	3.5646E+00	8.3372E+01	1.1136E+00	7.167E+01	6.402E-02
2.011215E+01	3.92483E+01	3.3283E+00	7.4955E+01	1.0649E+00	6.442E+01	6.165E-02
2.149988E+01	4.00917E+01	2.9812E+00	6.2803E+01	9.8367E-01	5.405E+01	5.767E-02
2.298338E+01	4.05400E+01	2.6792E+00	5.2799E+01	9.0822E-01	4.552E+01	5.395E-02
2.456923E+01	4.08303E+01	2.4080E+00	4.4392E+01	8.3827E-01	3.834E+01	5.046E-02
2.626450E+01	4.10302E+01	2.1563E+00	3.7185E+01	7.7357E-01	3.214E+01	4.721E-02
2.807676E+01	4.11681E+01	1.9214E+00	3.0997E+01	7.1386E-01	2.684E+01	4.416E-02
3.001405E+01	4.12581E+01	1.7100E+00	2.5805E+01	6.5886E-01	2.240E+01	4.131E-02
3.208502E+01	4.13169E+01	1.5220E+00	2.1483E+01	6.0831E-01	1.868E+01	3.864E-02
3.429889E+01	4.13540E+01	1.3548E+00	1.7891E+01	5.6192E-01	1.559E+01	3.615E-02
3.666551E+01	4.13762E+01	1.2062E+00	1.4900E+01	5.1944E-01	1.300E+01	3.381E-02
3.919543E+01	4.14228E+01	1.0700E+00	1.2364E+01	4.8060E-01	1.080E+01	3.163E-02
4.189992E+01	4.14217E+01	9.4541E-01	1.0220E+01	4.4514E-01	8.934E+00	2.959E-02
4.479101E+01	4.14125E+01	8.3542E-01	8.4478E+00	4.1282E-01	7.387E+00	2.768E-02
4.788159E+01	4.13981E+01	7.3828E-01	6.9837E+00	3.8340E-01	6.109E+00	2.589E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
5.118542E+01	4.13804E+01	6.5247E-01	5.7736E+00	3.5664E-01	5.051E+00	2.422E-02
5.471721E+01	4.13607E+01	5.7661E-01	4.7730E+00	3.3233E-01	4.177E+00	2.266E-02
5.849270E+01	4.13401E+01	5.0951E-01	3.9453E+00	3.1026E-01	3.454E+00	2.120E-02
6.252870E+01	4.13189E+01	4.5000E-01	3.2596E+00	2.9024E-01	2.856E+00	1.983E-02
6.684318E+01	4.12979E+01	3.9747E-01	2.6933E+00	2.7209E-01	2.362E+00	1.855E-02
7.145536E+01	4.12773E+01	3.5110E-01	2.2255E+00	2.5562E-01	1.953E+00	1.735E-02
7.638578E+01	4.12575E+01	3.1015E-01	1.8391E+00	2.4069E-01	1.615E+00	1.623E-02
8.165640E+01	4.12389E+01	2.7365E-01	1.5179E+00	2.2715E-01	1.334E+00	1.518E-02
8.729069E+01	4.12208E+01	2.4026E-01	1.2467E+00	2.1484E-01	1.095E+00	1.420E-02
9.331374E+01	4.12031E+01	2.1090E-01	1.0237E+00	2.0366E-01	8.992E-01	1.329E-02
9.975239E+01	4.11862E+01	1.8514E-01	8.4063E-01	1.9349E-01	7.383E-01	1.243E-02
1.066353E+02	4.11703E+01	1.6253E-01	6.9034E-01	1.8421E-01	6.061E-01	1.163E-02
1.139931E+02	4.11553E+01	1.4269E-01	5.6695E-01	1.7573E-01	4.976E-01	1.088E-02
1.218587E+02	4.11415E+01	1.2528E-01	4.6564E-01	1.6796E-01	4.086E-01	1.017E-02
1.302669E+02	4.11286E+01	1.0999E-01	3.8245E-01	1.6083E-01	3.354E-01	9.518E-03
1.392553E+02	4.11167E+01	9.6581E-02	3.1413E-01	1.5425E-01	2.754E-01	8.903E-03
1.488640E+02	4.11058E+01	8.4806E-02	2.5803E-01	1.4817E-01	2.261E-01	8.329E-03
1.591356E+02	4.10958E+01	7.4470E-02	2.1196E-01	1.4253E-01	1.856E-01	7.791E-03
1.701159E+02	4.10866E+01	6.5397E-02	1.7412E-01	1.3728E-01	1.524E-01	7.288E-03
1.818539E+02	4.10783E+01	5.7431E-02	1.4304E-01	1.3237E-01	1.251E-01	6.818E-03
1.944018E+02	4.10706E+01	5.0438E-02	1.1751E-01	1.2775E-01	1.027E-01	6.378E-03
2.078156E+02	4.10637E+01	4.4297E-02	9.6546E-02	1.2340E-01	8.434E-02	5.966E-03
2.221548E+02	4.10574E+01	3.8906E-02	7.9322E-02	1.1927E-01	6.924E-02	5.581E-03
2.374835E+02	4.10517E+01	3.4172E-02	6.5174E-02	1.1535E-01	5.685E-02	5.221E-03
2.538699E+02	4.10465E+01	3.0015E-02	5.3551E-02	1.1161E-01	4.667E-02	4.884E-03
2.713869E+02	4.10418E+01	2.6365E-02	4.4002E-02	1.0803E-01	3.832E-02	4.569E-03
2.901126E+02	4.10375E+01	2.3159E-02	3.6157E-02	1.0458E-01	3.146E-02	4.274E-03
3.101304E+02	4.10337E+01	2.0344E-02	2.9712E-02	1.0126E-01	2.583E-02	3.998E-03
3.315294E+02	4.10303E+01	1.7872E-02	2.4416E-02	9.8042E-02	2.121E-02	3.740E-03
3.544049E+02	4.10271E+01	1.5700E-02	2.0065E-02	9.4927E-02	1.741E-02	3.498E-03
3.788588E+02	4.10243E+01	1.3793E-02	1.6490E-02	9.1901E-02	1.429E-02	3.273E-03
4.050001E+02	4.10218E+01	1.2118E-02	1.3552E-02	8.8955E-02	1.173E-02	3.061E-03
4.329451E+02	4.10195E+01	1.0647E-02	1.1138E-02	8.6084E-02	9.634E-03	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 317

Mo Z = 42

Atomic weight = 9.594000E+01 g/mol, nominal density ρ (g/cm³) = 1.0200E+01

μ_{ph} (barns/atom) = μ (cm²/g) \times 1.59312E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.38611E+05

4 edges. Edge energies (keV):

K		1.99995E+00	L	I	2.86550E+00	L	II	2.62510E+00	L	III	2.52020E+00
M	I	5.04600E-00	M	II	4.09700E-00	M	III	3.92300E-00	M	IV	2.30300E-01
N	V	2.27000E-00	N	I	6.18000E-02	N	II	3.48000E-02	N	III	3.48000E-02
O	IV	1.80000E-03	O	V	1.80000E-03						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -3.4394E-01, -2.1540E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.0086E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{ph} cm ² /g	λ nm
1.069000E-02	5.43077E+00	4.2268E+00	1.7343E+05	2.1141E-04	0.000E+00	1.160E+02
1.142761E-02	5.65740E+00	4.3599E+00	1.6734E+05	2.8599E-04	0.000E+00	1.085E+02
1.221612E-02	5.89493E+00	4.4827E+00	1.6095E+05	3.8486E-04	0.000E+00	1.015E+02
1.305903E-02	6.14160E+00	4.5937E+00	1.5429E+05	5.1525E-04	0.000E+00	9.494E+01
1.396010E-02	6.39538E+00	4.6917E+00	1.4741E+05	6.8627E-04	0.000E+00	8.881E+01
1.492335E-02	6.65388E+00	4.7757E+00	1.4036E+05	9.0938E-04	0.000E+00	8.308E+01
1.595306E-02	6.91442E+00	4.8450E+00	1.3321E+05	1.1989E-03	0.000E+00	7.772E+01
1.705382E-02	7.17398E+00	4.8990E+00	1.2600E+05	1.5727E-03	0.000E+00	7.270E+01
1.823053E-02	7.42913E+00	4.9378E+00	1.1880E+05	2.0526E-03	0.000E+00	6.801E+01
1.948844E-02	7.67590E+00	4.9614E+00	1.1166E+05	2.6657E-03	0.000E+00	6.362E+01
2.083314E-02	7.90949E+00	4.9703E+00	1.0464E+05	3.4448E-03	0.000E+00	5.951E+01
2.227063E-02	8.12377E+00	4.9652E+00	9.7787E+04	4.4296E-03	0.000E+00	5.567E+01
2.380730E-02	8.31018E+00	4.9470E+00	9.1140E+04	5.6682E-03	0.000E+00	5.208E+01
2.545001E-02	8.45545E+00	4.9167E+00	8.4736E+04	7.2178E-03	0.000E+00	4.872E+01
2.720606E-02	8.53633E+00	4.8757E+00	7.8604E+04	9.1468E-03	0.000E+00	4.557E+01
2.908327E-02	8.50468E+00	4.8251E+00	7.2768E+04	1.1536E-02	0.000E+00	4.263E+01
3.109002E-02	8.23348E+00	4.7664E+00	6.7243E+04	1.4479E-02	0.000E+00	3.988E+01
3.323523E-02	7.71095E+00	4.7010E+00	6.2040E+04	1.8088E-02	0.000E+00	3.731E+01
3.410400E-02	5.77629E+00	4.6591E+00	5.9921E+04	1.9689E-02	0.000E+00	3.635E+01
3.462600E-02	2.90324E+00	4.6174E+00	5.8489E+04	2.0690E-02	0.000E+00	3.581E+01
3.476520E-02	-7.78485E-01	4.6063E+00	5.8115E+04	2.0962E-02	0.000E+00	3.566E+01
3.497400E-02	3.36242E+00	1.1959E+01	1.4998E+05	2.1373E-02	0.000E+00	3.545E+01
3.552846E-02	7.19047E+00	1.1443E+01	1.4127E+05	2.2490E-02	0.000E+00	3.490E+01
3.797993E-02	1.12789E+01	9.5682E+00	1.1050E+05	2.7833E-02	0.000E+00	3.264E+01
4.060054E-02	1.26164E+01	8.1374E+00	8.7909E+04	3.4285E-02	0.000E+00	3.054E+01
4.340198E-02	1.32362E+01	7.0647E+00	7.1394E+04	4.2038E-02	0.000E+00	2.857E+01
4.639671E-02	1.35538E+01	6.2404E+00	5.8993E+04	5.1308E-02	0.000E+00	2.672E+01
4.959809E-02	1.37210E+01	5.5908E+00	4.9441E+04	6.2338E-02	0.000E+00	2.500E+01
5.302035E-02	1.38042E+01	5.0665E+00	4.1912E+04	7.5397E-02	0.000E+00	2.338E+01
5.667876E-02	1.38311E+01	4.6336E+00	3.5857E+04	9.0782E-02	0.000E+00	2.187E+01
6.058959E-02	1.37870E+01	4.2690E+00	3.0904E+04	1.0882E-01	0.000E+00	2.046E+01
6.149100E-02	1.37286E+01	4.1958E+00	2.9929E+04	1.1321E-01	0.000E+00	2.016E+01
6.173820E-02	1.36601E+01	4.1764E+00	2.9671E+04	1.1442E-01	0.000E+00	2.008E+01
6.210900E-02	1.37257E+01	4.2808E+00	3.0231E+04	1.1626E-01	0.000E+00	1.996E+01
6.303600E-02	1.37810E+01	4.2156E+00	2.9332E+04	1.2092E-01	0.000E+00	1.967E+01
6.477028E-02	1.38132E+01	4.1021E+00	2.7778E+04	1.2987E-01	0.000E+00	1.914E+01
6.923942E-02	1.38363E+01	3.8525E+00	2.4404E+04	1.5430E-01	0.000E+00	1.791E+01
7.401695E-02	1.38351E+01	3.6366E+00	2.1550E+04	1.8254E-01	0.000E+00	1.675E+01
7.912411E-02	1.38196E+01	3.4473E+00	1.9109E+04	2.1500E-01	0.000E+00	1.567E+01
8.458368E-02	1.37912E+01	3.2799E+00	1.7008E+04	2.5215E-01	0.000E+00	1.466E+01
9.041995E-02	1.37496E+01	3.1308E+00	1.5187E+04	2.9446E-01	0.000E+00	1.371E+01
9.665893E-02	1.36931E+01	2.9973E+00	1.3601E+04	3.4241E-01	0.000E+00	1.283E+01
1.033284E-01	1.36193E+01	2.8770E+00	1.2212E+04	3.9649E-01	0.000E+00	1.200E+01
1.104581E-01	1.35141E+01	2.7682E+00	1.0992E+04	4.5720E-01	0.000E+00	1.122E+01
1.180797E-01	1.33944E+01	2.6694E+00	9.9154E+03	5.2502E-01	0.000E+00	1.050E+01
1.262272E-01	1.32439E+01	2.5793E+00	8.9625E+03	6.0042E-01	0.000E+00	9.822E+00
1.349368E-01	1.30549E+01	2.4969E+00	8.1162E+03	6.8385E-01	0.000E+00	9.188E+00
1.442475E-01	1.28173E+01	2.4212E+00	7.3621E+03	7.7571E-01	0.000E+00	8.595E+00
1.542005E-01	1.25165E+01	2.3510E+00	6.6872E+03	8.7638E-01	0.000E+00	8.040E+00
1.648404E-01	1.21311E+01	2.2854E+00	6.0810E+03	9.8616E-01	0.000E+00	7.521E+00
1.762144E-01	1.16281E+01	2.2236E+00	5.5347E+03	1.1053E+00	0.000E+00	7.036E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.883732E-01	1.09533E+01	2.1649E+00	5.0407E+03	1.2340E+00	0.000E+00	6.582E+00
2.013709E-01	9.99069E+00	2.1085E+00	4.5926E+03	1.3722E+00	0.000E+00	6.157E+00
2.152655E-01	8.43463E+00	2.0539E+00	4.1849E+03	1.5201E+00	0.000E+00	5.760E+00
2.224600E-01	7.04766E+00	2.0275E+00	3.9975E+03	1.5965E+00	0.000E+00	5.573E+00
2.256940E-01	5.83330E+00	2.0160E+00	3.9179E+03	1.6307E+00	0.000E+00	5.493E+00
2.258650E-01	5.72490E+00	2.0154E+00	3.9137E+03	1.6325E+00	0.000E+00	5.489E+00
2.267730E-01	4.69403E+00	2.0122E+00	3.8919E+03	1.6421E+00	0.000E+00	5.467E+00
2.281350E-01	5.09083E+00	3.6403E+00	6.9988E+03	1.6565E+00	0.000E+00	5.435E+00
2.291485E-01	5.02968E+00	3.6929E+00	7.0686E+03	1.6672E+00	0.000E+00	5.411E+00
2.301188E-01	4.41639E+00	3.7449E+00	7.1378E+03	1.6775E+00	0.000E+00	5.388E+00
2.314515E-01	5.00987E+00	4.9447E+00	9.3705E+03	1.6915E+00	0.000E+00	5.357E+00
2.315400E-01	5.03178E+00	4.9530E+00	9.3826E+03	1.6925E+00	0.000E+00	5.355E+00
2.349060E-01	5.28899E+00	5.2834E+00	9.8650E+03	1.7279E+00	0.000E+00	5.278E+00
2.459970E-01	4.84517E+00	6.6278E+00	1.1817E+04	1.8441E+00	0.000E+00	5.040E+00
2.629708E-01	4.24159E+00	9.4064E+00	1.5689E+04	2.0196E+00	0.000E+00	4.715E+00
2.811158E-01	4.54616E+00	1.2567E+01	1.9607E+04	2.2035E+00	0.000E+00	4.410E+00
3.005128E-01	5.81417E+00	1.5621E+01	2.2799E+04	2.3953E+00	0.000E+00	4.126E+00
3.212482E-01	7.86636E+00	1.8172E+01	2.4811E+04	2.5942E+00	0.000E+00	3.859E+00
3.434143E-01	1.03493E+01	1.9977E+01	2.5514E+04	2.7993E+00	0.000E+00	3.610E+00
3.671099E-01	1.27662E+01	2.0964E+01	2.5047E+04	3.0098E+00	0.000E+00	3.377E+00
3.844540E-01	1.37735E+01	2.1198E+01	2.4184E+04	3.1579E+00	0.000E+00	3.225E+00
3.903385E-01	1.32606E+01	2.1204E+01	2.3826E+04	3.2071E+00	0.000E+00	3.176E+00
3.919077E-01	1.21417E+01	2.1200E+01	2.3726E+04	3.2201E+00	0.000E+00	3.164E+00
3.924405E-01	1.13840E+01	2.3659E+01	2.6442E+04	3.2245E+00	0.000E+00	3.159E+00
3.942615E-01	1.36060E+01	2.3656E+01	2.6317E+04	3.2395E+00	0.000E+00	3.145E+00
4.001460E-01	1.51521E+01	2.3628E+01	2.5900E+04	3.2877E+00	0.000E+00	3.098E+00
4.015060E-01	1.53665E+01	2.3618E+01	2.5801E+04	3.2987E+00	0.000E+00	3.088E+00
4.076515E-01	1.59187E+01	2.3555E+01	2.5344E+04	3.3483E+00	0.000E+00	3.041E+00
4.092903E-01	1.56122E+01	2.3534E+01	2.5219E+04	3.3614E+00	0.000E+00	3.029E+00
4.117485E-01	1.65015E+01	2.4569E+01	2.6172E+04	3.3809E+00	0.000E+00	3.011E+00
4.178940E-01	1.77696E+01	2.4476E+01	2.5690E+04	3.4295E+00	0.000E+00	2.967E+00
4.195189E-01	1.80296E+01	2.4448E+01	2.5561E+04	3.4422E+00	0.000E+00	2.955E+00
4.484657E-01	2.14691E+01	2.3758E+01	2.3236E+04	3.6616E+00	0.000E+00	2.765E+00
4.794098E-01	2.39738E+01	2.2755E+01	2.0819E+04	3.8815E+00	0.000E+00	2.586E+00
4.945080E-01	2.47940E+01	2.2216E+01	1.9705E+04	3.9834E+00	0.000E+00	2.507E+00
5.020770E-01	2.48741E+01	2.1940E+01	1.9166E+04	4.0332E+00	0.000E+00	2.469E+00
5.040954E-01	2.45128E+01	2.1866E+01	1.9025E+04	4.0463E+00	0.000E+00	2.460E+00
5.071230E-01	2.51922E+01	2.2711E+01	1.9643E+04	4.0659E+00	0.000E+00	2.445E+00
5.124891E-01	2.58644E+01	2.2514E+01	1.9268E+04	4.1003E+00	0.000E+00	2.419E+00
5.146920E-01	2.60690E+01	2.2433E+01	1.9117E+04	4.1143E+00	0.000E+00	2.409E+00
5.478508E-01	2.82255E+01	2.1221E+01	1.6990E+04	4.3166E+00	0.000E+00	2.263E+00
5.856525E-01	2.99319E+01	1.9898E+01	1.4902E+04	4.5289E+00	0.000E+00	2.117E+00
6.260625E-01	3.12977E+01	1.8585E+01	1.3020E+04	4.7356E+00	0.000E+00	1.980E+00
6.692609E-01	3.24106E+01	1.7309E+01	1.1344E+04	4.9352E+00	0.000E+00	1.853E+00
7.154399E-01	3.33261E+01	1.6076E+01	9.8554E+03	5.1263E+00	0.000E+00	1.733E+00
7.648052E-01	3.40693E+01	1.4895E+01	8.5423E+03	5.3073E+00	0.000E+00	1.621E+00
8.175768E-01	3.46737E+01	1.3782E+01	7.3939E+03	5.4769E+00	0.000E+00	1.516E+00
8.739896E-01	3.51699E+01	1.2732E+01	6.3896E+03	5.6338E+00	0.000E+00	1.419E+00
9.342948E-01	3.55813E+01	1.1746E+01	5.5143E+03	5.7768E+00	0.000E+00	1.327E+00
9.987612E-01	3.59549E+01	1.0827E+01	4.7547E+03	5.9048E+00	0.000E+00	1.241E+00
1.067676E+00	3.61742E+01	9.8128E+00	4.0312E+03	6.0168E+00	0.000E+00	1.161E+00
1.141345E+00	3.62585E+01	8.9000E+00	3.4202E+03	6.1120E+00	0.000E+00	1.086E+00
1.220098E+00	3.62574E+01	8.0802E+00	2.9047E+03	6.1898E+00	0.000E+00	1.016E+00
1.304285E+00	3.61943E+01	7.3440E+00	2.4697E+03	6.2497E+00	0.000E+00	9.506E-01
1.394281E+00	3.60724E+01	6.6828E+00	2.1023E+03	6.2913E+00	0.000E+00	8.892E-01
1.490486E+00	3.59002E+01	6.0889E+00	1.7918E+03	6.3145E+00	0.000E+00	8.318E-01
1.593329E+00	3.56798E+01	5.5491E+00	1.5276E+03	6.3193E+00	0.000E+00	7.781E-01
1.703269E+00	3.53859E+01	5.0351E+00	1.2966E+03	6.3058E+00	0.000E+00	7.279E-01
1.820795E+00	3.49914E+01	4.5682E+00	1.1004E+03	6.2743E+00	0.000E+00	6.809E-01
1.946430E+00	3.44650E+01	4.1501E+00	9.3520E+02	6.2254E+00	0.000E+00	6.370E-01
2.080733E+00	3.37340E+01	3.7728E+00	7.9529E+02	6.1597E+00	0.000E+00	5.959E-01
2.224304E+00	3.26163E+01	3.4311E+00	6.7658E+02	6.0778E+00	0.000E+00	5.574E-01
2.377781E+00	3.05017E+01	3.1240E+00	5.7626E+02	5.9807E+00	0.000E+00	5.214E-01
2.469796E+00	2.75231E+01	2.9632E+00	5.2624E+02	5.9190E+00	0.000E+00	5.020E-01
2.507599E+00	2.37090E+01	2.9015E+00	5.0752E+02	5.8931E+00	0.000E+00	4.944E-01

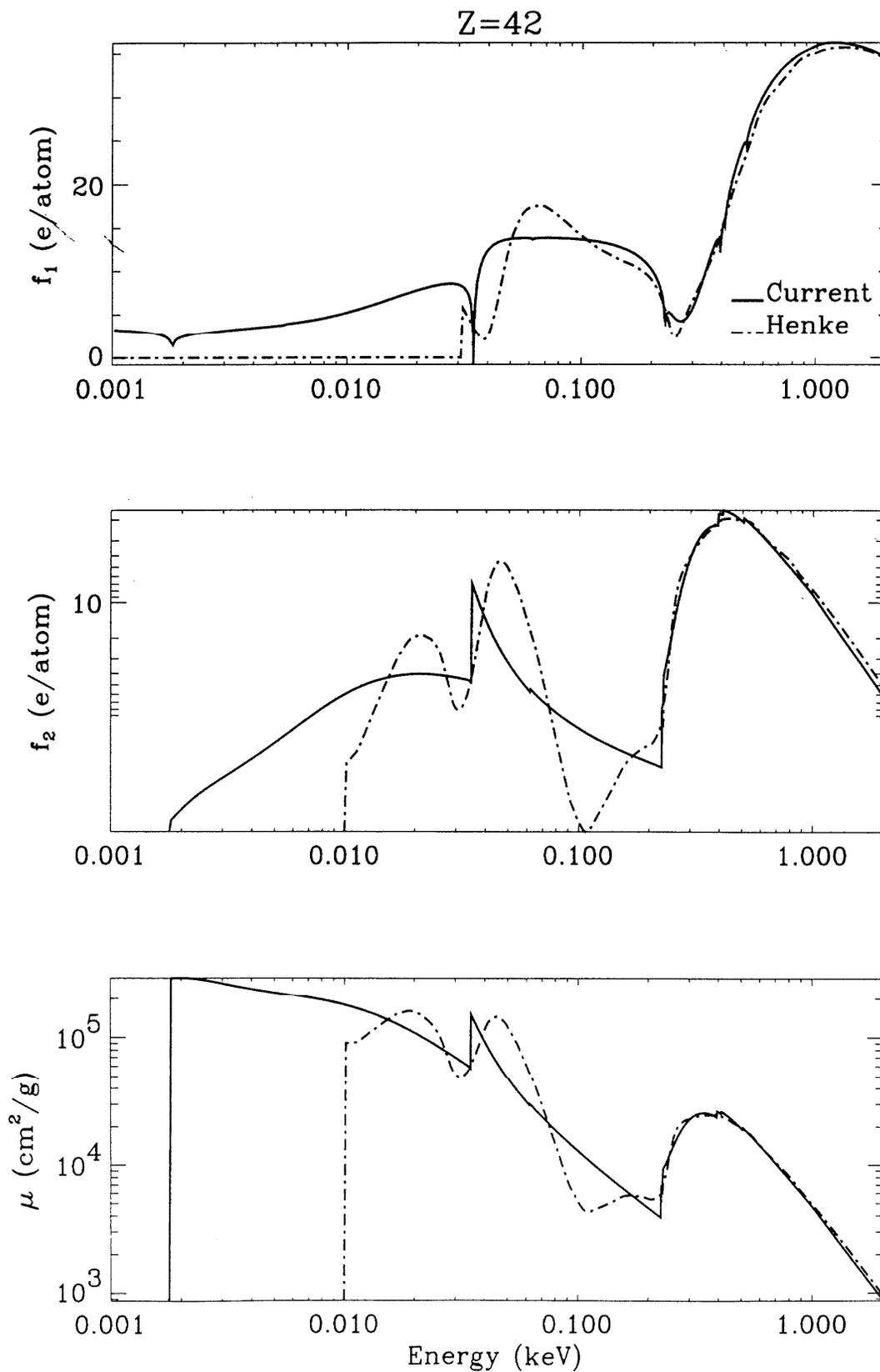
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 319

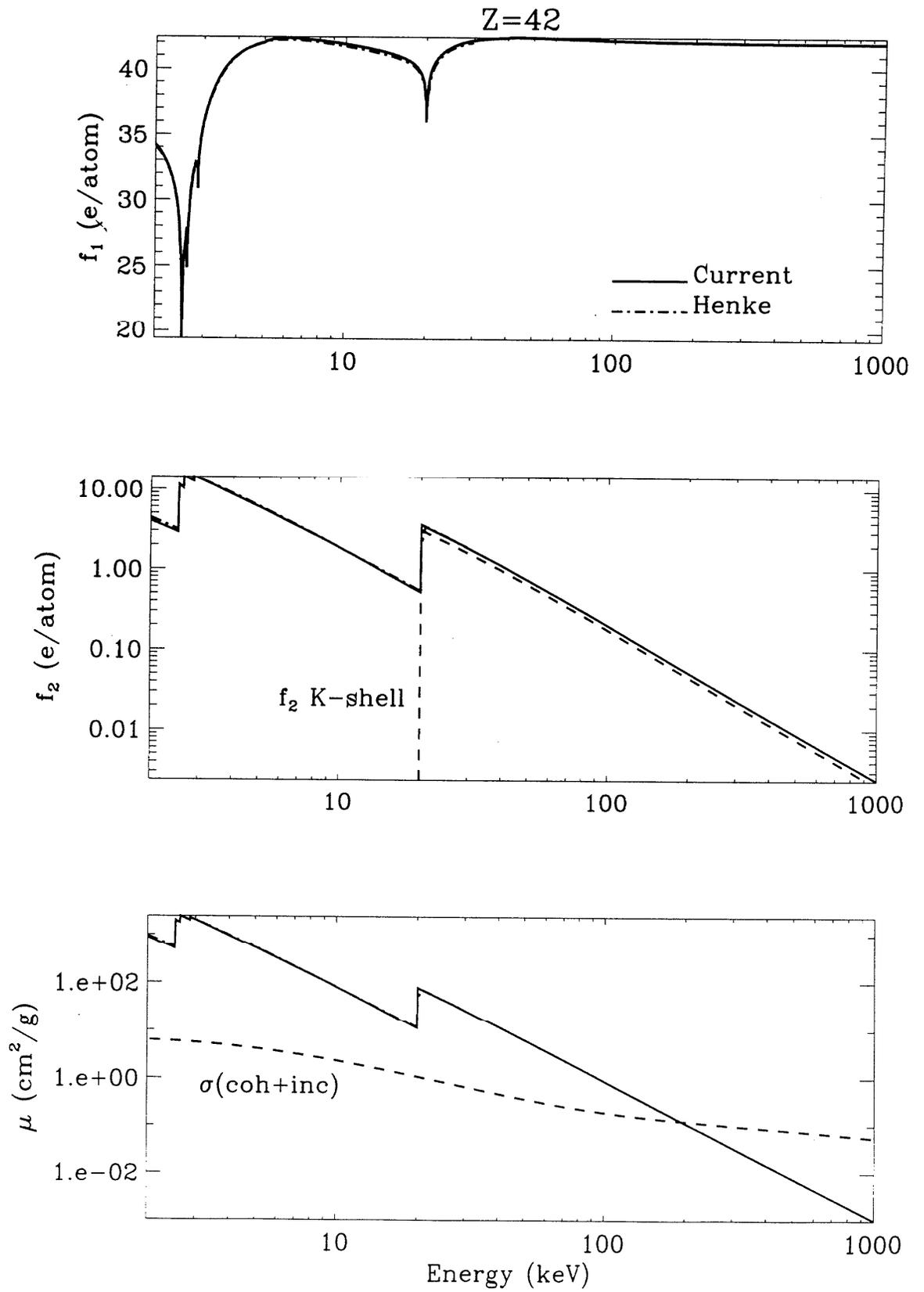
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
2.517680E+00	1.94030E+01	2.8855E+00	5.0269E+02	5.8861E+00	0.000E+00	4.925E-01
2.532801E+00	2.35006E+01	1.1137E+01	1.9287E+03	5.8757E+00	0.000E+00	4.895E-01
2.541848E+00	2.48690E+01	1.1065E+01	1.9093E+03	5.8694E+00	0.000E+00	4.878E-01
2.572598E+00	2.67832E+01	1.0825E+01	1.8456E+03	5.8479E+00	0.000E+00	4.819E-01
2.611974E+00	2.66161E+01	1.0530E+01	1.7682E+03	5.8201E+00	0.000E+00	4.747E-01
2.622475E+00	2.48332E+01	1.0453E+01	1.7483E+03	5.8127E+00	0.000E+00	4.728E-01
2.638225E+00	2.73320E+01	1.4436E+01	2.3999E+03	5.8015E+00	0.000E+00	4.700E-01
2.677602E+00	2.99784E+01	1.4071E+01	2.3049E+03	5.7733E+00	0.000E+00	4.630E-01
2.717235E+00	3.12991E+01	1.3727E+01	2.2158E+03	5.7448E+00	0.000E+00	4.563E-01
2.808190E+00	3.28300E+01	1.3020E+01	2.0335E+03	5.6788E+00	0.000E+00	4.415E-01
2.851172E+00	3.27180E+01	1.2718E+01	1.9565E+03	5.6474E+00	0.000E+00	4.349E-01
2.862634E+00	3.19251E+01	1.2640E+01	1.9367E+03	5.6391E+00	0.000E+00	4.331E-01
2.879827E+00	3.31218E+01	1.4410E+01	2.1948E+03	5.6265E+00	0.000E+00	4.305E-01
2.904724E+00	3.40687E+01	1.4233E+01	2.1491E+03	5.6082E+00	0.000E+00	4.268E-01
2.922810E+00	3.45276E+01	1.4106E+01	2.1169E+03	5.5949E+00	0.000E+00	4.242E-01
3.105150E+00	3.71639E+01	1.2897E+01	1.8217E+03	5.4607E+00	0.000E+00	3.993E-01
3.319406E+00	3.88104E+01	1.1637E+01	1.5377E+03	5.3035E+00	0.000E+00	3.735E-01
3.548445E+00	3.99027E+01	1.0453E+01	1.2921E+03	5.1380E+00	0.000E+00	3.494E-01
3.793288E+00	4.06420E+01	9.3804E+00	1.0846E+03	4.9653E+00	0.000E+00	3.269E-01
4.055024E+00	4.11562E+01	8.4242E+00	9.1121E+02	4.7867E+00	0.000E+00	3.058E-01
4.334821E+00	4.15188E+01	7.5706E+00	7.6602E+02	4.6035E+00	0.000E+00	2.860E-01
4.633924E+00	4.17742E+01	6.8064E+00	6.4424E+02	4.4169E+00	0.000E+00	2.676E-01
4.953664E+00	4.19551E+01	6.1245E+00	5.4228E+02	4.2281E+00	0.000E+00	2.503E-01
5.295467E+00	4.22145E+01	5.4907E+00	4.5478E+02	4.0382E+00	0.000E+00	2.341E-01
5.660855E+00	4.22760E+01	4.9080E+00	3.8028E+02	3.8482E+00	0.000E+00	2.190E-01
6.051453E+00	4.23318E+01	4.3807E+00	3.1751E+02	3.6592E+00	0.000E+00	2.049E-01
6.469004E+00	4.23136E+01	3.9113E+00	2.6519E+02	3.4720E+00	0.000E+00	1.917E-01
6.915365E+00	4.22721E+01	3.4954E+00	2.2170E+02	3.2875E+00	0.000E+00	1.793E-01
7.392525E+00	4.22157E+01	3.1265E+00	1.8550E+02	3.1066E+00	0.000E+00	1.677E-01
7.902609E+00	4.21495E+01	2.7961E+00	1.5519E+02	2.9297E+00	0.000E+00	1.569E-01
8.447890E+00	4.20778E+01	2.5023E+00	1.2992E+02	2.7577E+00	0.000E+00	1.468E-01
9.030794E+00	4.20075E+01	2.2363E+00	1.0862E+02	2.5909E+00	0.000E+00	1.373E-01
9.653919E+00	4.19204E+01	1.9837E+00	9.0127E+01	2.4298E+00	0.000E+00	1.284E-01
1.032004E+01	4.18235E+01	1.7606E+00	7.4827E+01	2.2748E+00	0.000E+00	1.201E-01
1.103212E+01	4.17208E+01	1.5633E+00	6.2152E+01	2.1261E+00	0.000E+00	1.124E-01
1.179334E+01	4.16110E+01	1.3840E+00	5.1472E+01	1.9840E+00	0.000E+00	1.051E-01
1.260708E+01	4.14919E+01	1.2244E+00	4.2598E+01	1.8485E+00	0.000E+00	9.834E-02
1.347697E+01	4.13594E+01	1.0802E+00	3.5156E+01	1.7199E+00	0.000E+00	9.200E-02
1.440688E+01	4.12086E+01	9.5392E-01	2.9042E+01	1.5981E+00	0.000E+00	8.606E-02
1.540095E+01	4.10305E+01	8.4315E-01	2.4013E+01	1.4831E+00	0.000E+00	8.050E-02
1.646362E+01	4.08051E+01	7.4588E-01	1.9871E+01	1.3747E+00	0.000E+00	7.531E-02
1.759961E+01	4.04829E+01	6.6041E-01	1.6459E+01	1.2730E+00	0.000E+00	7.043E-02
1.881398E+01	3.98893E+01	5.8527E-01	1.3644E+01	1.1777E+00	0.000E+00	6.590E-02
1.959951E+01	3.89193E+01	5.4374E-01	1.2168E+01	1.1224E+00	0.000E+00	6.326E-02
1.989950E+01	3.76005E+01	5.2913E-01	1.1663E+01	1.1025E+00	0.000E+00	6.231E-02
1.997950E+01	3.60126E+01	5.2534E-01	1.1533E+01	1.0973E+00	0.000E+00	6.206E-02
2.011215E+01	3.77527E+01	3.6454E+00	7.9499E+01	1.0887E+00	6.818E+01	6.165E-02
2.039949E+01	3.90911E+01	3.5517E+00	7.6366E+01	1.0706E+00	6.548E+01	6.078E-02
2.149988E+01	4.05117E+01	3.2372E+00	6.6041E+01	1.0058E+00	5.664E+01	5.767E-02
2.298338E+01	4.12203E+01	2.9040E+00	5.5470E+01	9.2865E-01	4.760E+01	5.395E-02
2.456923E+01	4.16227E+01	2.6105E+00	4.6603E+01	8.5712E-01	4.010E+01	5.046E-02
2.626450E+01	4.18901E+01	2.3438E+00	3.9141E+01	7.9092E-01	3.373E+01	4.721E-02
2.807676E+01	4.20745E+01	2.0896E+00	3.2644E+01	7.2979E-01	2.818E+01	4.416E-02
3.001405E+01	4.21944E+01	1.8604E+00	2.7187E+01	6.7346E-01	2.353E+01	4.131E-02
3.208502E+01	4.22738E+01	1.6566E+00	2.2646E+01	6.2164E-01	1.964E+01	3.864E-02
3.429889E+01	4.23257E+01	1.4753E+00	1.8866E+01	5.7408E-01	1.639E+01	3.615E-02
3.666551E+01	4.23582E+01	1.3140E+00	1.5718E+01	5.3049E-01	1.368E+01	3.381E-02
3.919543E+01	4.23775E+01	1.1704E+00	1.3097E+01	4.9061E-01	1.142E+01	3.163E-02
4.189992E+01	4.24210E+01	1.0370E+00	1.0855E+01	4.5419E-01	9.475E+00	2.959E-02
4.479101E+01	4.24178E+01	9.1661E-01	8.9758E+00	4.2097E-01	7.838E+00	2.768E-02
4.788159E+01	4.24073E+01	8.1030E-01	7.4226E+00	3.9070E-01	6.484E+00	2.589E-02
5.118542E+01	4.23921E+01	7.1637E-01	6.1386E+00	3.6316E-01	5.363E+00	2.422E-02
5.471721E+01	4.23741E+01	6.3337E-01	5.0770E+00	3.3813E-01	4.437E+00	2.266E-02
5.849270E+01	4.23543E+01	5.5996E-01	4.1989E+00	3.1540E-01	3.670E+00	2.120E-02
6.252870E+01	4.23337E+01	4.9496E-01	3.4719E+00	2.9476E-01	3.036E+00	1.983E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.684318E+01	4.23128E+01	4.3732E-01	2.8696E+00	2.7604E-01	2.512E+00	1.855E-02
7.145536E+01	4.22920E+01	3.8642E-01	2.3719E+00	2.5905E-01	2.078E+00	1.735E-02
7.638578E+01	4.22718E+01	3.4147E-01	1.9607E+00	2.4364E-01	1.719E+00	1.623E-02
8.165640E+01	4.22527E+01	3.0134E-01	1.6186E+00	2.2966E-01	1.420E+00	1.518E-02
8.729069E+01	4.22342E+01	2.6504E-01	1.3318E+00	2.1696E-01	1.168E+00	1.420E-02
9.331374E+01	4.22160E+01	2.3277E-01	1.0941E+00	2.0541E-01	9.597E-01	1.329E-02
9.975239E+01	4.21984E+01	2.0445E-01	8.9895E-01	1.9491E-01	7.884E-01	1.243E-02
1.066353E+02	4.21817E+01	1.7958E-01	7.3863E-01	1.8533E-01	6.477E-01	1.163E-02
1.139931E+02	4.21660E+01	1.5774E-01	6.0693E-01	1.7658E-01	5.321E-01	1.088E-02
1.218587E+02	4.21514E+01	1.3856E-01	4.9874E-01	1.6858E-01	4.371E-01	1.017E-02
1.302669E+02	4.21378E+01	1.2172E-01	4.0985E-01	1.6123E-01	3.591E-01	9.518E-03
1.392553E+02	4.21253E+01	1.0694E-01	3.3682E-01	1.5446E-01	2.950E-01	8.903E-03
1.488640E+02	4.21137E+01	9.3950E-02	2.7681E-01	1.4822E-01	2.423E-01	8.329E-03
1.591356E+02	4.21030E+01	8.2544E-02	2.2751E-01	1.4243E-01	1.991E-01	7.791E-03
1.701159E+02	4.20933E+01	7.2525E-02	1.8699E-01	1.3705E-01	1.635E-01	7.288E-03
1.818539E+02	4.20843E+01	6.3725E-02	1.5370E-01	1.3203E-01	1.343E-01	6.818E-03
1.944018E+02	4.20762E+01	5.5995E-02	1.2634E-01	1.2732E-01	1.104E-01	6.378E-03
2.078156E+02	4.20688E+01	4.9205E-02	1.0385E-01	1.2289E-01	9.066E-02	5.966E-03
2.221548E+02	4.20620E+01	4.3239E-02	8.5370E-02	1.1870E-01	7.448E-02	5.581E-03
2.374835E+02	4.20559E+01	3.7999E-02	7.0180E-02	1.1474E-01	6.118E-02	5.221E-03
2.538699E+02	4.20503E+01	3.3394E-02	5.7695E-02	1.1096E-01	5.026E-02	4.884E-03
2.713869E+02	4.20453E+01	2.9348E-02	4.7433E-02	1.0735E-01	4.129E-02	4.569E-03
2.901126E+02	4.20407E+01	2.5794E-02	3.8997E-02	1.0389E-01	3.392E-02	4.274E-03
3.101304E+02	4.20366E+01	2.2671E-02	3.2063E-02	1.0056E-01	2.786E-02	3.998E-03
3.315294E+02	4.20328E+01	1.9926E-02	2.6362E-02	9.7356E-02	2.289E-02	3.740E-03
3.544049E+02	4.20295E+01	1.7514E-02	2.1676E-02	9.4256E-02	1.880E-02	3.498E-03
3.788588E+02	4.20264E+01	1.5395E-02	1.7823E-02	9.1251E-02	1.545E-02	3.273E-03
4.050001E+02	4.20237E+01	1.3533E-02	1.4656E-02	8.8334E-02	1.269E-02	3.061E-03
4.329451E+02	4.20212E+01	1.1896E-02	1.2051E-02	8.5498E-02	1.042E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 323

Tc Z = 43

Atomic weight = 9.800000E+01 g/mol, nominal density ρ (g/cm³) = 1.1480E+01

μ_{κ} (barns/atom) = μ (cm²/g) \times 1.62733E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.29391E+05

4 edges. Edge energies (keV):

K		2.10440E+00	L	I	3.04250E+00	L	II	2.79320E+00	L	III	2.67690E+00
M	I	5.47600E-00	M	II	4.44900E-00	M	III	4.25000E-00	M	IV	2.56400E-01
M	V	2.52900E-00	N	I	6.84000E-02	N	II	3.89000E-02	N	III	3.89000E-02
N	IV	7.01158E-03	N	V	6.72942E-03						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -3.6457E-01, -2.2800E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.0350E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{κ} cm ² /g	λ nm
6.594833E-03	4.82558E+00	0.0000E+00	0.0000E+00	1.3816E-05	0.000E+00	1.880E+02
6.695774E-03	4.59453E+00	0.0000E+00	0.0000E+00	1.4971E-05	0.000E+00	1.852E+02
6.722692E-03	4.41601E+00	0.0000E+00	0.0000E+00	1.5292E-05	0.000E+00	1.844E+02
6.763068E-03	4.50917E+00	2.8287E-01	1.7960E+04	1.5782E-05	0.000E+00	1.833E+02
6.864010E-03	4.44636E+00	2.7410E-01	1.7147E+04	1.7059E-05	0.000E+00	1.806E+02
6.871351E-03	4.43283E+00	2.7348E-01	1.7090E+04	1.7155E-05	0.000E+00	1.804E+02
6.976524E-03	3.99241E+00	2.6479E-01	1.6297E+04	1.8575E-05	0.000E+00	1.777E+02
7.004571E-03	3.43742E+00	2.6254E-01	1.6094E+04	1.8968E-05	0.000E+00	1.770E+02
7.046640E-03	4.02391E+00	1.3562E+00	8.2638E+04	1.9570E-05	0.000E+00	1.759E+02
7.151814E-03	4.52865E+00	1.3160E+00	7.9014E+04	2.1138E-05	0.000E+00	1.734E+02
1.069000E-02	3.69822E+00	1.9224E+00	7.7220E+04	1.5426E-04	0.000E+00	1.160E+02
1.142761E-02	3.35022E+00	2.4517E+00	9.2123E+04	2.1050E-04	0.000E+00	1.085E+02
1.221612E-02	3.04621E+00	3.1433E+00	1.1049E+05	2.8572E-04	0.000E+00	1.015E+02
1.305903E-02	2.83967E+00	4.0047E+00	1.3168E+05	3.8576E-04	0.000E+00	9.494E+01
1.396010E-02	2.79407E+00	5.0239E+00	1.5453E+05	5.1807E-04	0.000E+00	8.881E+01
1.492335E-02	2.97422E+00	6.1624E+00	1.7731E+05	6.9213E-04	0.000E+00	8.308E+01
1.595306E-02	3.43337E+00	7.3533E+00	1.9792E+05	9.1985E-04	0.000E+00	7.772E+01
1.705382E-02	4.19913E+00	8.5056E+00	2.1416E+05	1.2162E-03	0.000E+00	7.270E+01
1.823053E-02	5.26243E+00	9.5168E+00	2.2415E+05	1.5997E-03	0.000E+00	6.801E+01
1.948844E-02	6.57362E+00	1.0290E+01	2.2673E+05	2.0933E-03	0.000E+00	6.362E+01
2.083314E-02	8.05140E+00	1.0753E+01	2.2163E+05	2.7254E-03	0.000E+00	5.951E+01
2.227063E-02	9.59139E+00	1.0869E+01	2.0957E+05	3.5305E-03	0.000E+00	5.567E+01
2.380730E-02	1.10679E+01	1.0643E+01	1.9197E+05	4.5504E-03	0.000E+00	5.208E+01
2.545001E-02	1.23918E+01	1.0118E+01	1.7071E+05	5.8358E-03	0.000E+00	4.872E+01
2.720606E-02	1.34889E+01	9.3601E+00	1.4773E+05	7.4471E-03	0.000E+00	4.557E+01
2.908327E-02	1.43111E+01	8.4491E+00	1.2474E+05	9.4566E-03	0.000E+00	4.263E+01
3.109002E-02	1.48282E+01	7.4627E+00	1.0307E+05	1.1950E-02	0.000E+00	3.988E+01
3.323523E-02	1.50121E+01	6.4738E+00	8.3640E+04	1.5026E-02	0.000E+00	3.731E+01
3.552846E-02	1.47684E+01	5.5364E+00	6.6912E+04	1.8804E-02	0.000E+00	3.490E+01
3.797993E-02	1.33431E+01	4.6841E+00	5.2957E+04	2.3419E-02	0.000E+00	3.264E+01
3.812200E-02	1.31246E+01	4.6393E+00	5.2256E+04	2.3705E-02	0.000E+00	3.252E+01
3.870550E-02	1.11702E+01	4.4606E+00	4.9484E+04	2.4902E-02	0.000E+00	3.203E+01
3.886110E-02	8.71925E+00	4.4142E+00	4.8775E+04	2.5227E-02	0.000E+00	3.190E+01
3.909450E-02	1.14330E+01	9.2224E+00	1.0129E+05	2.5719E-02	0.000E+00	3.171E+01
3.967800E-02	1.38226E+01	8.7692E+00	9.4900E+04	2.6973E-02	0.000E+00	3.125E+01
4.060054E-02	1.51868E+01	8.1102E+00	8.5773E+04	2.9028E-02	0.000E+00	3.054E+01
4.340198E-02	1.65957E+01	6.4701E+00	6.4011E+04	3.5810E-02	0.000E+00	2.857E+01
4.639671E-02	1.69305E+01	5.2237E+00	4.8345E+04	4.3969E-02	0.000E+00	2.672E+01
4.959809E-02	1.69190E+01	4.2849E+00	3.7096E+04	5.3735E-02	0.000E+00	2.500E+01
5.302035E-02	1.67624E+01	3.5682E+00	2.8998E+04	6.5365E-02	0.000E+00	2.338E+01
5.667876E-02	1.65406E+01	3.0159E+00	2.2848E+04	7.9148E-02	0.000E+00	2.187E+01
6.058959E-02	1.62876E+01	2.5871E+00	1.8335E+04	9.5398E-02	0.000E+00	2.046E+01
6.477028E-02	1.60082E+01	2.2526E+00	1.4934E+04	1.1446E-01	0.000E+00	1.914E+01
6.703200E-02	1.58314E+01	2.1100E+00	1.3516E+04	1.2549E-01	0.000E+00	1.850E+01
6.805800E-02	1.56989E+01	2.0523E+00	1.2948E+04	1.3065E-01	0.000E+00	1.822E+01
6.833160E-02	1.55940E+01	2.0376E+00	1.2804E+04	1.3205E-01	0.000E+00	1.814E+01
6.874200E-02	1.56614E+01	2.1929E+00	1.3698E+04	1.3415E-01	0.000E+00	1.804E+01
6.923942E-02	1.56855E+01	2.1696E+00	1.3455E+04	1.3672E-01	0.000E+00	1.791E+01
6.976800E-02	1.56858E+01	2.1457E+00	1.3206E+04	1.3948E-01	0.000E+00	1.777E+01
7.401695E-02	1.55655E+01	1.9838E+00	1.1508E+04	1.6257E-01	0.000E+00	1.675E+01
7.912411E-02	1.53932E+01	1.8436E+00	1.0005E+04	1.9246E-01	0.000E+00	1.567E+01
8.458368E-02	1.52214E+01	1.7381E+00	8.8235E+03	2.2683E-01	0.000E+00	1.466E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
9.041995E-02	1.50539E+01	1.6596E+00	7.8812E+03	2.6617E-01	0.000E+00	1.371E+01
9.665893E-02	1.48894E+01	1.6023E+00	7.1179E+03	3.1098E-01	0.000E+00	1.283E+01
1.033284E-01	1.47251E+01	1.5616E+00	6.4894E+03	3.6176E-01	0.000E+00	1.200E+01
1.104581E-01	1.45568E+01	1.5338E+00	5.9625E+03	4.1904E-01	0.000E+00	1.122E+01
1.180797E-01	1.43659E+01	1.5160E+00	5.5130E+03	4.8332E-01	0.000E+00	1.050E+01
1.262272E-01	1.41734E+01	1.5058E+00	5.1223E+03	5.5511E-01	0.000E+00	9.822E+00
1.349368E-01	1.39586E+01	1.5076E+00	4.7976E+03	6.3490E-01	0.000E+00	9.188E+00
1.442475E-01	1.37169E+01	1.5202E+00	4.5252E+03	7.2314E-01	0.000E+00	8.595E+00
1.542005E-01	1.34373E+01	1.5352E+00	4.2751E+03	8.2025E-01	0.000E+00	8.040E+00
1.648404E-01	1.31040E+01	1.5516E+00	4.0418E+03	9.2659E-01	0.000E+00	7.521E+00
1.762144E-01	1.26951E+01	1.5680E+00	3.8208E+03	1.0425E+00	0.000E+00	7.036E+00
1.883732E-01	1.21779E+01	1.5835E+00	3.6095E+03	1.1681E+00	0.000E+00	6.582E+00
2.013709E-01	1.14995E+01	1.5974E+00	3.4062E+03	1.3037E+00	0.000E+00	6.157E+00
2.152655E-01	1.05653E+01	1.6090E+00	3.2095E+03	1.4493E+00	0.000E+00	5.760E+00
2.301188E-01	9.14953E+00	1.6179E+00	3.0189E+03	1.6048E+00	0.000E+00	5.388E+00
2.459970E-01	6.38418E+00	1.6235E+00	2.8338E+03	1.7700E+00	0.000E+00	5.040E+00
2.478420E-01	5.80494E+00	1.6239E+00	2.8134E+03	1.7891E+00	0.000E+00	5.003E+00
2.512720E-01	4.08107E+00	1.6245E+00	2.7761E+03	1.8245E+00	0.000E+00	4.934E+00
2.516355E-01	3.76123E+00	1.6246E+00	2.7722E+03	1.8283E+00	0.000E+00	4.927E+00
2.526471E-01	2.03092E+00	1.6247E+00	2.7613E+03	1.8387E+00	0.000E+00	4.907E+00
2.541645E-01	2.86996E+00	4.4826E+00	7.5729E+03	1.8544E+00	0.000E+00	4.878E+00
2.551180E-01	2.87946E+00	4.5451E+00	7.6498E+03	1.8642E+00	0.000E+00	4.860E+00
2.561436E-01	2.07427E+00	4.6135E+00	7.7340E+03	1.8747E+00	0.000E+00	4.840E+00
2.576820E-01	3.14086E+00	6.6747E+00	1.1122E+04	1.8905E+00	0.000E+00	4.812E+00
2.579580E-01	3.26901E+00	6.7057E+00	1.1162E+04	1.8934E+00	0.000E+00	4.806E+00
2.615280E-01	4.00850E+00	7.1221E+00	1.1693E+04	1.9300E+00	0.000E+00	4.741E+00
2.629708E-01	4.13181E+00	7.2981E+00	1.1917E+04	1.9447E+00	0.000E+00	4.715E+00
2.811158E-01	4.40739E+00	9.9312E+00	1.5169E+04	2.1285E+00	0.000E+00	4.410E+00
3.005128E-01	5.07732E+00	1.3083E+01	1.8694E+04	2.3208E+00	0.000E+00	4.126E+00
3.212482E-01	6.59798E+00	1.6043E+01	2.1444E+04	2.5209E+00	0.000E+00	3.859E+00
3.434143E-01	8.79609E+00	1.8465E+01	2.3088E+04	2.7280E+00	0.000E+00	3.610E+00
3.671099E-01	1.13486E+01	2.0151E+01	2.3570E+04	2.9413E+00	0.000E+00	3.377E+00
3.924405E-01	1.38240E+01	2.1056E+01	2.3038E+04	3.1595E+00	0.000E+00	3.159E+00
4.165000E-01	1.51673E+01	2.1258E+01	2.1916E+04	3.3574E+00	0.000E+00	2.977E+00
4.195189E-01	1.50733E+01	2.1248E+01	2.1748E+04	3.3816E+00	0.000E+00	2.955E+00
4.228750E-01	1.45720E+01	2.1230E+01	2.1557E+04	3.4084E+00	0.000E+00	2.932E+00
4.245750E-01	1.33707E+01	2.1217E+01	2.1458E+04	3.4218E+00	0.000E+00	2.920E+00
4.271230E-01	1.49086E+01	2.3814E+01	2.3941E+04	3.4419E+00	0.000E+00	2.903E+00
4.335000E-01	1.65109E+01	2.3757E+01	2.3531E+04	3.4918E+00	0.000E+00	2.860E+00
4.360020E-01	1.68695E+01	2.3727E+01	2.3368E+04	3.5112E+00	0.000E+00	2.844E+00
4.426755E-01	1.73684E+01	2.3633E+01	2.2924E+04	3.5624E+00	0.000E+00	2.801E+00
4.444551E-01	1.70243E+01	2.3604E+01	2.2804E+04	3.5760E+00	0.000E+00	2.790E+00
4.471245E-01	1.79400E+01	2.4669E+01	2.3713E+04	3.5962E+00	0.000E+00	2.773E+00
4.484657E-01	1.82734E+01	2.4670E+01	2.3621E+04	3.6063E+00	0.000E+00	2.765E+00
4.537980E-01	1.92209E+01	2.4574E+01	2.3253E+04	3.6463E+00	0.000E+00	2.732E+00
4.794098E-01	2.21872E+01	2.3978E+01	2.1477E+04	3.8322E+00	0.000E+00	2.586E+00
5.124891E-01	2.48222E+01	2.2983E+01	1.9257E+04	4.0577E+00	0.000E+00	2.419E+00
5.366480E-01	2.60979E+01	2.2175E+01	1.7743E+04	4.2125E+00	0.000E+00	2.310E+00
5.448620E-01	2.61559E+01	2.1894E+01	1.7254E+04	4.2633E+00	0.000E+00	2.276E+00
5.470524E-01	2.57769E+01	2.1819E+01	1.7126E+04	4.2766E+00	0.000E+00	2.266E+00
5.478508E-01	2.55775E+01	2.2778E+01	1.7853E+04	4.2815E+00	0.000E+00	2.263E+00
5.503380E-01	2.64692E+01	2.2693E+01	1.7706E+04	4.2966E+00	0.000E+00	2.253E+00
5.585520E-01	2.73518E+01	2.2410E+01	1.7228E+04	4.3458E+00	0.000E+00	2.220E+00
5.856525E-01	2.90479E+01	2.1484E+01	1.5752E+04	4.5019E+00	0.000E+00	2.117E+00
6.260625E-01	3.08296E+01	2.0157E+01	1.3825E+04	4.7174E+00	0.000E+00	1.980E+00
6.692609E-01	3.22455E+01	1.8842E+01	1.2089E+04	4.9262E+00	0.000E+00	1.853E+00
7.154399E-01	3.34075E+01	1.7572E+01	1.0546E+04	5.1270E+00	0.000E+00	1.733E+00
7.648052E-01	3.43822E+01	1.6319E+01	9.1620E+03	5.3181E+00	0.000E+00	1.621E+00
8.175768E-01	3.51671E+01	1.5113E+01	7.9373E+03	5.4980E+00	0.000E+00	1.516E+00
8.739896E-01	3.57977E+01	1.3979E+01	6.8680E+03	5.6653E+00	0.000E+00	1.419E+00
9.342948E-01	3.63196E+01	1.2921E+01	5.9383E+03	5.8188E+00	0.000E+00	1.327E+00
9.987612E-01	3.67772E+01	1.1935E+01	5.1312E+03	5.9572E+00	0.000E+00	1.241E+00
1.067676E+00	3.71357E+01	1.0834E+01	4.3572E+03	6.0794E+00	0.000E+00	1.161E+00
1.141345E+00	3.73028E+01	9.8127E+00	3.6917E+03	6.1847E+00	0.000E+00	1.086E+00
1.220098E+00	3.73608E+01	8.9011E+00	3.1326E+03	6.2721E+00	0.000E+00	1.016E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 325

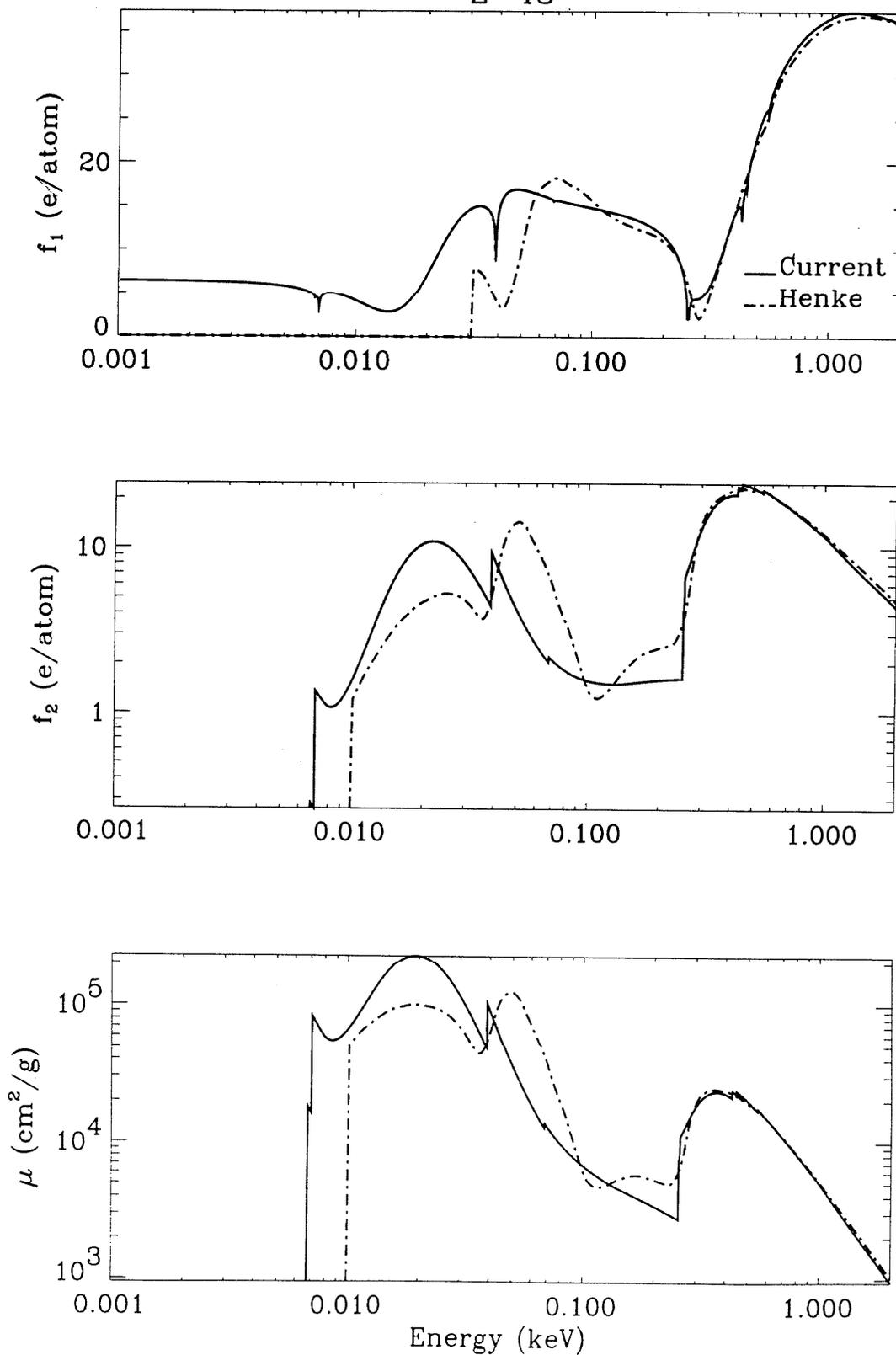
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

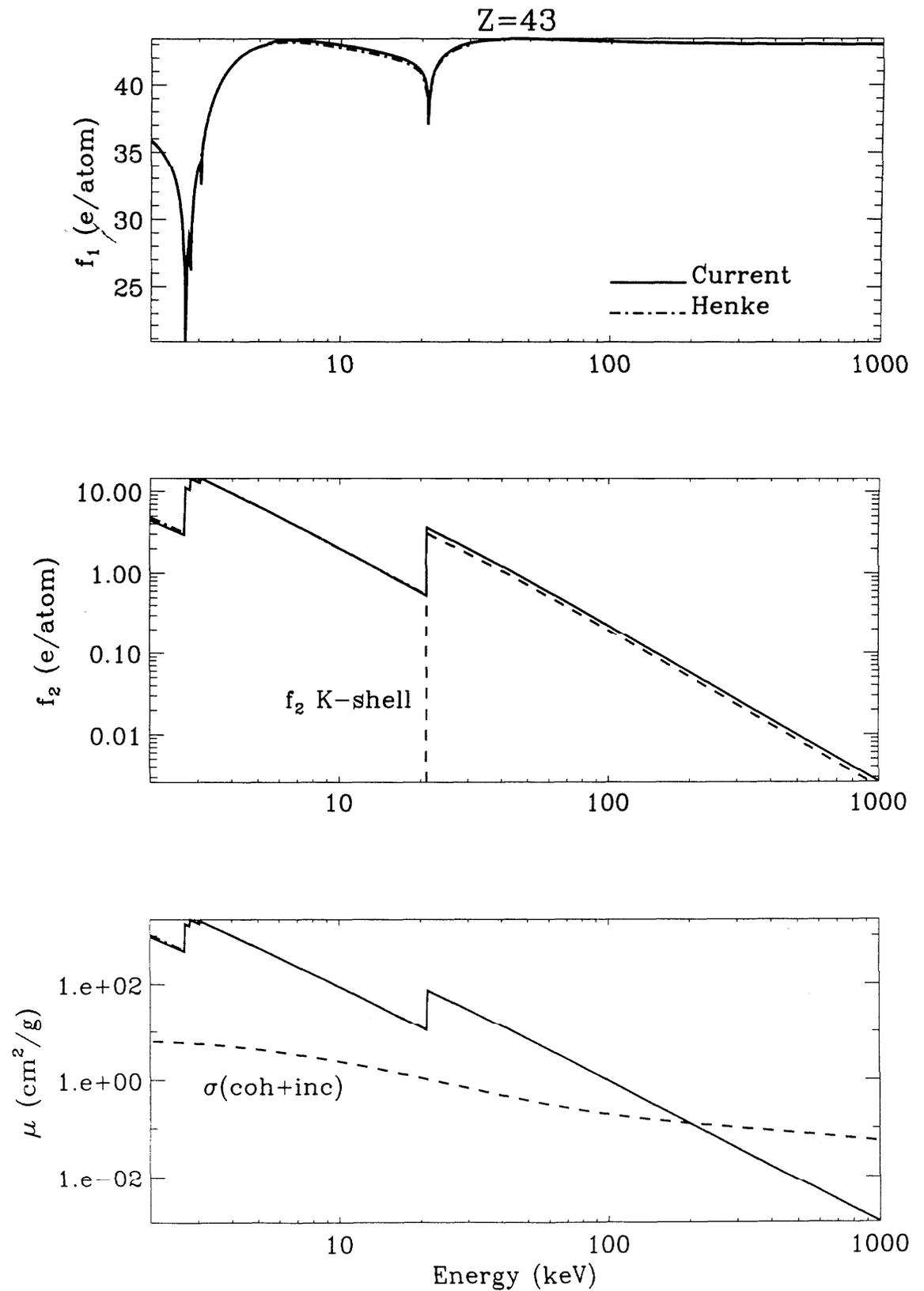
E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.304285E+00	3.73470E+01	8.0867E+00	2.6623E+03	6.3411E+00	0.000E+00	9.506E-01
1.394281E+00	3.72693E+01	7.3578E+00	2.2659E+03	6.3914E+00	0.000E+00	8.892E-01
1.490486E+00	3.71397E+01	6.7054E+00	1.9317E+03	6.4225E+00	0.000E+00	8.318E-01
1.593329E+00	3.69636E+01	6.1210E+00	1.6496E+03	6.4346E+00	0.000E+00	7.781E-01
1.703269E+00	3.67440E+01	5.5959E+00	1.4107E+03	6.4277E+00	0.000E+00	7.279E-01
1.820795E+00	3.64560E+01	5.0865E+00	1.1995E+03	6.4020E+00	0.000E+00	6.809E-01
1.946430E+00	3.60649E+01	4.6190E+00	1.0190E+03	6.3581E+00	0.000E+00	6.370E-01
2.080733E+00	3.55373E+01	4.2000E+00	8.6673E+02	6.2965E+00	0.000E+00	5.959E-01
2.224304E+00	3.47971E+01	3.8225E+00	7.3791E+02	6.2179E+00	0.000E+00	5.574E-01
2.377781E+00	3.36483E+01	3.4791E+00	6.2827E+02	6.1232E+00	0.000E+00	5.214E-01
2.541848E+00	3.13904E+01	3.1701E+00	5.3551E+02	6.0134E+00	0.000E+00	4.878E-01
2.623362E+00	2.87881E+01	3.0348E+00	4.9673E+02	5.9565E+00	0.000E+00	4.726E-01
2.663515E+00	2.50323E+01	2.9720E+00	4.7912E+02	5.9281E+00	0.000E+00	4.655E-01
2.674223E+00	2.07808E+01	2.9556E+00	4.7458E+02	5.9205E+00	0.000E+00	4.636E-01
2.690284E+00	2.48440E+01	1.1112E+01	1.7735E+03	5.9090E+00	0.000E+00	4.609E-01
2.717235E+00	2.75114E+01	1.0908E+01	1.7238E+03	5.8896E+00	0.000E+00	4.563E-01
2.730438E+00	2.80698E+01	1.0811E+01	1.7001E+03	5.8801E+00	0.000E+00	4.541E-01
2.737336E+00	2.82666E+01	1.0760E+01	1.6879E+03	5.8751E+00	0.000E+00	4.529E-01
2.779234E+00	2.80038E+01	1.0462E+01	1.6163E+03	5.8448E+00	0.000E+00	4.461E-01
2.790407E+00	2.62259E+01	1.0384E+01	1.5980E+03	5.8367E+00	0.000E+00	4.443E-01
2.807166E+00	2.86758E+01	1.4318E+01	2.1901E+03	5.8245E+00	0.000E+00	4.417E-01
2.849064E+00	3.12570E+01	1.3966E+01	2.1049E+03	5.7938E+00	0.000E+00	4.352E-01
2.904724E+00	3.28473E+01	1.3532E+01	2.0004E+03	5.7530E+00	0.000E+00	4.268E-01
2.981650E+00	3.39650E+01	1.3001E+01	1.8724E+03	5.6962E+00	0.000E+00	4.158E-01
3.027288E+00	3.38793E+01	1.2694E+01	1.8006E+03	5.6624E+00	0.000E+00	4.096E-01
3.039458E+00	3.30922E+01	1.2611E+01	1.7816E+03	5.6534E+00	0.000E+00	4.079E-01
3.057713E+00	3.42883E+01	1.4368E+01	2.0177E+03	5.6398E+00	0.000E+00	4.055E-01
3.105150E+00	3.57277E+01	1.4032E+01	1.9404E+03	5.6046E+00	0.000E+00	3.993E-01
3.319406E+00	3.84624E+01	1.2651E+01	1.6365E+03	5.4460E+00	0.000E+00	3.735E-01
3.548445E+00	3.99967E+01	1.1386E+01	1.3778E+03	5.2782E+00	0.000E+00	3.494E-01
3.793288E+00	4.10105E+01	1.0235E+01	1.1585E+03	5.1027E+00	0.000E+00	3.269E-01
4.055024E+00	4.17156E+01	9.1995E+00	9.7414E+02	4.9208E+00	0.000E+00	3.058E-01
4.334821E+00	4.22095E+01	8.2654E+00	8.1874E+02	4.7338E+00	0.000E+00	2.860E-01
4.633924E+00	4.25576E+01	7.4299E+00	6.8848E+02	4.5429E+00	0.000E+00	2.676E-01
4.953664E+00	4.28030E+01	6.6808E+00	5.7910E+02	4.3495E+00	0.000E+00	2.503E-01
5.295467E+00	4.29757E+01	6.0099E+00	4.8732E+02	4.1546E+00	0.000E+00	2.341E-01
5.660855E+00	4.32230E+01	5.3838E+00	4.0838E+02	3.9594E+00	0.000E+00	2.190E-01
6.051453E+00	4.32768E+01	4.8130E+00	3.4152E+02	3.7650E+00	0.000E+00	2.049E-01
6.469004E+00	4.33256E+01	4.2974E+00	2.8525E+02	3.5723E+00	0.000E+00	1.917E-01
6.915365E+00	4.33043E+01	3.8397E+00	2.3842E+02	3.3823E+00	0.000E+00	1.793E-01
7.392525E+00	4.32619E+01	3.4340E+00	1.9946E+02	3.1957E+00	0.000E+00	1.677E-01
7.902609E+00	4.32061E+01	3.0740E+00	1.6703E+02	3.0135E+00	0.000E+00	1.569E-01
8.447890E+00	4.31423E+01	2.7519E+00	1.3987E+02	2.8357E+00	0.000E+00	1.468E-01
9.030794E+00	4.30782E+01	2.4588E+00	1.1691E+02	2.6635E+00	0.000E+00	1.373E-01
9.653919E+00	4.30003E+01	2.1809E+00	9.7003E+01	2.4972E+00	0.000E+00	1.284E-01
1.032004E+01	4.29078E+01	1.9363E+00	8.0563E+01	2.3370E+00	0.000E+00	1.201E-01
1.103212E+01	4.28080E+01	1.7198E+00	6.6936E+01	2.1834E+00	0.000E+00	1.124E-01
1.179334E+01	4.27034E+01	1.5276E+00	5.5619E+01	2.0365E+00	0.000E+00	1.051E-01
1.260708E+01	4.25915E+01	1.3533E+00	4.6092E+01	1.8966E+00	0.000E+00	9.834E-02
1.347697E+01	4.24704E+01	1.1976E+00	3.8155E+01	1.7637E+00	0.000E+00	9.200E-02
1.440688E+01	4.23348E+01	1.0573E+00	3.1512E+01	1.6378E+00	0.000E+00	8.606E-02
1.540095E+01	4.21793E+01	9.3432E-01	2.6050E+01	1.5190E+00	0.000E+00	8.050E-02
1.646362E+01	4.19933E+01	8.2640E-01	2.1554E+01	1.4071E+00	0.000E+00	7.531E-02
1.759961E+01	4.17525E+01	7.3162E-01	1.7850E+01	1.3020E+00	0.000E+00	7.045E-02
1.881398E+01	4.13935E+01	6.4823E-01	1.4794E+01	1.2037E+00	0.000E+00	6.590E-02
2.011215E+01	4.06536E+01	5.7486E-01	1.2273E+01	1.1118E+00	0.000E+00	6.165E-02
2.062312E+01	3.99411E+01	5.4960E-01	1.1443E+01	1.0789E+00	0.000E+00	6.012E-02
2.093878E+01	3.86303E+01	5.3488E-01	1.0969E+01	1.0594E+00	0.000E+00	5.921E-02
2.102296E+01	3.70523E+01	5.3106E-01	1.0847E+01	1.0544E+00	0.000E+00	5.898E-02
2.114922E+01	3.86579E+01	3.6354E+00	7.3809E+01	1.0468E+00	6.314E+01	5.862E-02
2.146488E+01	4.01100E+01	3.5390E+00	7.0796E+01	1.0283E+00	6.056E+01	5.776E-02
2.149988E+01	4.01953E+01	3.5286E+00	7.0472E+01	1.0263E+00	6.028E+01	5.767E-02
2.298338E+01	4.17384E+01	3.1461E+00	5.8778E+01	9.4677E-01	5.031E+01	5.395E-02
2.456923E+01	4.23426E+01	2.8263E+00	4.9395E+01	8.7306E-01	4.235E+01	5.046E-02
2.626450E+01	4.27056E+01	2.5402E+00	4.1529E+01	8.0489E-01	3.566E+01	4.721E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
2.807676E+01	4.29520E+01	2.2694E+00	3.4707E+01	7.4198E-01	2.988E+01	4.416E-02
3.001405E+01	4.31118E+01	2.0210E+00	2.8912E+01	6.8404E-01	2.495E+01	4.131E-02
3.208502E+01	4.32180E+01	1.7999E+00	2.4088E+01	6.3079E-01	2.083E+01	3.864E-02
3.429889E+01	4.32885E+01	1.6032E+00	2.0071E+01	5.8195E-01	1.739E+01	3.615E-02
3.666551E+01	4.33341E+01	1.4282E+00	1.6726E+01	5.3724E-01	1.452E+01	3.381E-02
3.919543E+01	4.33624E+01	1.2725E+00	1.3940E+01	4.9637E-01	1.213E+01	3.163E-02
4.189992E+01	4.33789E+01	1.1338E+00	1.1620E+01	4.5907E-01	1.012E+01	2.959E-02
4.479101E+01	4.34189E+01	1.0031E+00	9.6163E+00	4.2510E-01	8.384E+00	2.768E-02
4.788159E+01	4.34135E+01	8.8705E-01	7.9548E+00	3.9418E-01	6.938E+00	2.589E-02
5.118542E+01	4.34018E+01	7.8449E-01	6.5810E+00	3.6609E-01	5.742E+00	2.422E-02
5.471721E+01	4.33859E+01	6.9384E-01	5.4449E+00	3.4058E-01	4.751E+00	2.266E-02
5.849270E+01	4.33675E+01	6.1369E-01	4.5051E+00	3.1745E-01	3.932E+00	2.120E-02
6.252870E+01	4.33477E+01	5.4278E-01	3.7273E+00	2.9648E-01	3.254E+00	1.983E-02
6.684318E+01	4.33271E+01	4.7993E-01	3.0830E+00	2.7749E-01	2.693E+00	1.855E-02
7.145536E+01	4.33064E+01	4.2419E-01	2.5490E+00	2.6028E-01	2.228E+00	1.735E-02
7.638578E+01	4.32860E+01	3.7495E-01	2.1077E+00	2.4470E-01	1.844E+00	1.623E-02
8.165640E+01	4.32669E+01	3.3100E-01	1.7405E+00	2.3058E-01	1.524E+00	1.518E-02
8.729069E+01	4.32479E+01	2.9131E-01	1.4330E+00	2.1778E-01	1.255E+00	1.420E-02
9.331374E+01	4.32291E+01	2.5624E-01	1.1791E+00	2.0616E-01	1.033E+00	1.329E-02
9.975239E+01	4.32109E+01	2.2515E-01	9.6919E-01	1.9561E-01	8.491E-01	1.243E-02
1.066353E+02	4.31935E+01	1.9785E-01	7.9669E-01	1.8601E-01	6.979E-01	1.163E-02
1.139931E+02	4.31771E+01	1.7387E-01	6.5493E-01	1.7725E-01	5.737E-01	1.088E-02
1.218587E+02	4.31617E+01	1.5280E-01	5.3841E-01	1.6924E-01	4.715E-01	1.017E-02
1.302669E+02	4.31474E+01	1.3429E-01	4.4265E-01	1.6191E-01	3.876E-01	9.518E-03
1.392553E+02	4.31342E+01	1.1803E-01	3.6393E-01	1.5516E-01	3.186E-01	8.903E-03
1.488640E+02	4.31219E+01	1.0374E-01	2.9923E-01	1.4894E-01	2.619E-01	8.329E-03
1.591356E+02	4.31106E+01	9.1183E-02	2.4604E-01	1.4318E-01	2.153E-01	7.791E-03
1.701159E+02	4.31002E+01	8.0151E-02	2.0231E-01	1.3782E-01	1.769E-01	7.288E-03
1.818539E+02	4.30907E+01	7.0456E-02	1.6636E-01	1.3282E-01	1.454E-01	6.818E-03
1.944018E+02	4.30820E+01	6.1936E-02	1.3680E-01	1.2814E-01	1.196E-01	6.378E-03
2.078156E+02	4.30741E+01	5.4449E-02	1.1250E-01	1.2373E-01	9.827E-02	5.966E-03
2.221548E+02	4.30669E+01	4.7869E-02	9.2523E-02	1.1956E-01	8.078E-02	5.581E-03
2.374835E+02	4.30603E+01	4.2085E-02	7.6093E-02	1.1560E-01	6.640E-02	5.221E-03
2.538699E+02	4.30543E+01	3.7001E-02	6.2583E-02	1.1182E-01	5.458E-02	4.884E-03
2.713869E+02	4.30489E+01	3.2533E-02	5.1474E-02	1.0821E-01	4.486E-02	4.569E-03
2.901126E+02	4.30440E+01	2.8605E-02	4.2338E-02	1.0474E-01	3.687E-02	4.274E-03
3.101304E+02	4.30396E+01	2.5152E-02	3.4824E-02	1.0139E-01	3.031E-02	3.998E-03
3.315294E+02	4.30356E+01	2.2117E-02	2.8645E-02	9.8160E-02	2.491E-02	3.740E-03
3.544049E+02	4.30319E+01	1.9448E-02	2.3563E-02	9.5028E-02	2.048E-02	3.498E-03
3.788588E+02	4.30287E+01	1.7102E-02	1.9383E-02	9.1984E-02	1.683E-02	3.273E-03
4.050001E+02	4.30257E+01	1.5040E-02	1.5945E-02	8.9022E-02	1.384E-02	3.061E-03
4.329451E+02	4.30230E+01	1.3226E-02	1.3117E-02	8.6133E-02	1.137E-02	2.864E-03

Z=43





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 329

Ru Z = 44

Atomic weight = 1.010700E+02 g/mol, nominal density ρ (g/cm³) = 1.2390E+01

μ_{ph} (barns/atom) = μ (cm²/g) \times 1.67831E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.16348E+05

4 edges. Edge energies (keV):

K		2.21172E+00	L	I	3.22400E+00	L	II	2.96690E+00	L	III	2.83790E+00
M	I	5.85000E-00	M	II	4.82800E-00	M	III	4.60600E-00	M	IV	2.83600E-01
M	V	2.79400E-00	N	I	7.49000E-02	N	II	4.31000E-02	N	III	4.31000E-02
N	IV	2.00000E-03	N	V	2.00000E-03						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -3.8596E-01, -2.4060E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.0508E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	1.00155E+00	5.1187E+00	1.9936E+05	1.3341E-04	0.000E+00	1.160E+02
1.142761E-02	1.21062E+00	5.4437E+00	1.9833E+05	1.8296E-04	0.000E+00	1.085E+02
1.221612E-02	1.45119E+00	5.7730E+00	1.9675E+05	2.4954E-04	0.000E+00	1.015E+02
1.305903E-02	1.72392E+00	6.1017E+00	1.9453E+05	3.3851E-04	0.000E+00	9.494E+01
1.396010E-02	2.02883E+00	6.4268E+00	1.9168E+05	4.5674E-04	0.000E+00	8.881E+01
1.492335E-02	2.36557E+00	6.7445E+00	1.8816E+05	6.1299E-04	0.000E+00	8.308E+01
1.595306E-02	2.73311E+00	7.0507E+00	1.8401E+05	8.1834E-04	0.000E+00	7.772E+01
1.705382E-02	3.12973E+00	7.3418E+00	1.7924E+05	1.0867E-03	0.000E+00	7.270E+01
1.823053E-02	3.55307E+00	7.6143E+00	1.7390E+05	1.4356E-03	0.000E+00	6.801E+01
1.948844E-02	4.00016E+00	7.8653E+00	1.6803E+05	1.8866E-03	0.000E+00	6.362E+01
2.083314E-02	4.46753E+00	8.0923E+00	1.6172E+05	2.4665E-03	0.000E+00	5.951E+01
2.227063E-02	4.95122E+00	8.2934E+00	1.5505E+05	3.2081E-03	0.000E+00	5.567E+01
2.380730E-02	5.44688E+00	8.4674E+00	1.4808E+05	4.1514E-03	0.000E+00	5.208E+01
2.545001E-02	5.94974E+00	8.6137E+00	1.4092E+05	5.3449E-03	0.000E+00	4.872E+01
2.720606E-02	6.45448E+00	8.7324E+00	1.3364E+05	6.8469E-03	0.000E+00	4.557E+01
2.908327E-02	6.95483E+00	8.8241E+00	1.2632E+05	8.7270E-03	0.000E+00	4.263E+01
3.109002E-02	7.44255E+00	8.8900E+00	1.1905E+05	1.1068E-02	0.000E+00	3.988E+01
3.323523E-02	7.90470E+00	8.9319E+00	1.1189E+05	1.3968E-02	0.000E+00	3.731E+01
3.552846E-02	8.31580E+00	8.9519E+00	1.0490E+05	1.7542E-02	0.000E+00	3.490E+01
3.797993E-02	8.60832E+00	8.9057E+00	9.7628E+04	2.1922E-02	0.000E+00	3.264E+01
4.060054E-02	8.40350E+00	8.6080E+00	8.8273E+04	2.7264E-02	0.000E+00	3.054E+01
4.223800E-02	7.19875E+00	8.4221E+00	8.3018E+04	3.0954E-02	0.000E+00	2.935E+01
4.288450E-02	4.95206E+00	8.3490E+00	8.1057E+04	3.2487E-02	0.000E+00	2.891E+01
4.305690E-02	1.97649E+00	8.3296E+00	8.0545E+04	3.2903E-02	0.000E+00	2.880E+01
4.331550E-02	5.41269E+00	1.4303E+01	1.3748E+05	3.3533E-02	0.000E+00	2.862E+01
4.340198E-02	6.14069E+00	1.4235E+01	1.3656E+05	3.3745E-02	0.000E+00	2.857E+01
4.396200E-02	8.52148E+00	1.3811E+01	1.3080E+05	3.5137E-02	0.000E+00	2.820E+01
4.639671E-02	1.17689E+01	1.2250E+01	1.0993E+05	4.1566E-02	0.000E+00	2.672E+01
4.959809E-02	1.32029E+01	1.0748E+01	9.0227E+04	5.0959E-02	0.000E+00	2.500E+01
5.302035E-02	1.39004E+01	9.6507E+00	7.5783E+04	6.2179E-02	0.000E+00	2.338E+01
5.667876E-02	1.43271E+01	8.8029E+00	6.4664E+04	7.5516E-02	0.000E+00	2.187E+01
6.058959E-02	1.46223E+01	8.1135E+00	5.5753E+04	9.1287E-02	0.000E+00	2.046E+01
6.477028E-02	1.48381E+01	7.5299E+00	4.8403E+04	1.0984E-01	0.000E+00	1.914E+01
6.923942E-02	1.49907E+01	7.0211E+00	4.2219E+04	1.3157E-01	0.000E+00	1.791E+01
7.340200E-02	1.50472E+01	6.6222E+00	3.7562E+04	1.5350E-01	0.000E+00	1.689E+01
7.401693E-02	1.50352E+01	6.5681E+00	3.6946E+04	1.5688E-01	0.000E+00	1.675E+01
7.452550E-02	1.50028E+01	6.5243E+00	3.6449E+04	1.5969E-01	0.000E+00	1.664E+01
7.482510E-02	1.49268E+01	6.4988E+00	3.6161E+04	1.6136E-01	0.000E+00	1.657E+01
7.527450E-02	1.50174E+01	6.6227E+00	3.6630E+04	1.6388E-01	0.000E+00	1.647E+01
7.639800E-02	1.51110E+01	6.5353E+00	3.5616E+04	1.7026E-01	0.000E+00	1.623E+01
7.912411E-02	1.52164E+01	6.3367E+00	3.3344E+04	1.8621E-01	0.000E+00	1.567E+01
8.458368E-02	1.53454E+01	5.9877E+00	2.9474E+04	2.2003E-01	0.000E+00	1.466E+01
9.041995E-02	1.54374E+01	5.6701E+00	2.6109E+04	2.5884E-01	0.000E+00	1.371E+01
9.665893E-02	1.55029E+01	5.3793E+00	2.3171E+04	3.0316E-01	0.000E+00	1.283E+01
1.033284E-01	1.55443E+01	5.1122E+00	2.0599E+04	3.5351E-01	0.000E+00	1.200E+01
1.104581E-01	1.55624E+01	4.8664E+00	1.8343E+04	4.1043E-01	0.000E+00	1.122E+01
1.180797E-01	1.55564E+01	4.6398E+00	1.6360E+04	4.7446E-01	0.000E+00	1.050E+01
1.262272E-01	1.55248E+01	4.4308E+00	1.4614E+04	5.4614E-01	0.000E+00	9.822E+00
1.349368E-01	1.54530E+01	4.2376E+00	1.3075E+04	6.2597E-01	0.000E+00	9.188E+00
1.442475E-01	1.53607E+01	4.0589E+00	1.1715E+04	7.1445E-01	0.000E+00	8.595E+00
1.542005E-01	1.52304E+01	3.8933E+00	1.0512E+04	8.1202E-01	0.000E+00	8.040E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.64840E-01	1.50544E+01	3.7394E+00	9.4448E+03	9.1909E-01	0.000E+00	7.521E+00
1.762144E-01	1.48216E+01	3.5959E+00	8.4961E+03	1.0360E+00	0.000E+00	7.036E+00
1.883732E-01	1.45159E+01	3.4611E+00	7.6497E+03	1.1630E+00	0.000E+00	6.582E+00
2.013709E-01	1.41129E+01	3.3336E+00	6.8925E+03	1.3003E+00	0.000E+00	6.157E+00
2.152655E-01	1.35743E+01	3.2125E+00	6.2133E+03	1.4480E+00	0.000E+00	5.760E+00
2.301188E-01	1.28364E+01	3.0966E+00	5.6026E+03	1.6060E+00	0.000E+00	5.388E+00
2.459970E-01	1.17634E+01	2.9852E+00	5.0525E+03	1.7742E+00	0.000E+00	5.040E+00
2.629708E-01	9.99936E+00	2.8775E+00	4.5559E+03	1.9523E+00	0.000E+00	4.715E+00
2.738120E-01	7.92428E+00	2.8139E+00	4.2787E+03	2.0649E+00	0.000E+00	4.528E+00
2.779280E-01	6.16444E+00	2.7907E+00	4.1805E+03	2.1073E+00	0.000E+00	4.461E+00
2.780030E-01	6.10788E+00	2.7902E+00	4.1788E+03	2.1080E+00	0.000E+00	4.460E+00
2.791206E-01	4.61041E+00	2.7840E+00	4.1527E+03	2.1195E+00	0.000E+00	4.442E+00
2.807970E-01	5.30456E+00	5.2239E+00	7.7457E+03	2.1367E+00	0.000E+00	4.415E+00
2.811158E-01	5.34954E+00	5.2405E+00	7.7615E+03	2.1400E+00	0.000E+00	4.410E+00
2.821820E-01	5.26510E+00	5.2969E+00	7.8154E+03	2.1509E+00	0.000E+00	4.394E+00
2.833164E-01	4.50713E+00	5.3584E+00	7.8745E+03	2.1625E+00	0.000E+00	4.376E+00
2.850180E-01	5.36581E+00	7.1567E+00	1.0454E+04	2.1799E+00	0.000E+00	4.350E+00
2.892720E-01	5.99852E+00	7.5805E+00	1.0911E+04	2.2233E+00	0.000E+00	4.286E+00
3.005128E-01	6.05492E+00	8.8910E+00	1.2318E+04	2.3367E+00	0.000E+00	4.126E+00
3.212482E-01	5.99312E+00	1.1975E+01	1.5520E+04	2.5417E+00	0.000E+00	3.859E+00
3.434143E-01	6.94055E+00	1.5257E+01	1.8498E+04	2.7543E+00	0.000E+00	3.610E+00
3.671099E-01	8.82922E+00	1.8158E+01	2.0594E+04	2.9734E+00	0.000E+00	3.377E+00
3.924405E-01	1.13403E+01	2.0327E+01	2.1565E+04	3.1979E+00	0.000E+00	3.159E+00
4.195189E-01	1.39957E+01	2.1614E+01	2.1450E+04	3.4268E+00	0.000E+00	2.955E+00
4.484657E-01	1.59267E+01	2.2049E+01	2.0470E+04	3.6586E+00	0.000E+00	2.765E+00
4.513880E-01	1.59534E+01	2.2050E+01	2.0339E+04	3.6813E+00	0.000E+00	2.747E+00
4.582970E-01	1.53295E+01	2.2028E+01	2.0012E+04	3.7344E+00	0.000E+00	2.705E+00
4.601394E-01	1.40529E+01	2.2017E+01	1.9922E+04	3.7484E+00	0.000E+00	2.694E+00
4.629030E-01	1.56982E+01	2.4785E+01	2.2293E+04	3.7693E+00	0.000E+00	2.678E+00
4.698120E-01	1.74209E+01	2.4722E+01	2.1909E+04	3.8212E+00	0.000E+00	2.639E+00
4.731440E-01	1.78891E+01	2.4682E+01	2.1719E+04	3.8459E+00	0.000E+00	2.620E+00
4.794098E-01	1.84095E+01	2.4590E+01	2.1356E+04	3.8920E+00	0.000E+00	2.586E+00
4.803860E-01	1.84097E+01	2.4574E+01	2.1298E+04	3.8991E+00	0.000E+00	2.581E+00
4.823172E-01	1.80427E+01	2.4541E+01	2.1185E+04	3.9131E+00	0.000E+00	2.571E+00
4.852140E-01	1.90159E+01	2.5694E+01	2.2047E+04	3.9341E+00	0.000E+00	2.555E+00
4.924560E-01	2.03756E+01	2.5556E+01	2.1606E+04	3.9860E+00	0.000E+00	2.518E+00
5.124891E-01	2.27608E+01	2.5078E+01	2.0374E+04	4.1253E+00	0.000E+00	2.419E+00
5.478508E-01	2.56936E+01	2.4006E+01	1.8244E+04	4.3571E+00	0.000E+00	2.263E+00
5.733000E-01	2.70826E+01	2.3139E+01	1.6804E+04	4.5132E+00	0.000E+00	2.163E+00
5.820750E-01	2.71746E+01	2.2832E+01	1.6331E+04	4.5649E+00	0.000E+00	2.130E+00
5.844150E-01	2.68006E+01	2.2750E+01	1.6208E+04	4.5786E+00	0.000E+00	2.122E+00
5.856525E-01	2.69064E+01	2.3702E+01	1.6850E+04	4.5857E+00	0.000E+00	2.117E+00
5.879250E-01	2.75104E+01	2.3622E+01	1.6729E+04	4.5989E+00	0.000E+00	2.109E+00
5.967000E-01	2.84278E+01	2.3314E+01	1.6268E+04	4.6490E+00	0.000E+00	2.078E+00
6.260625E-01	3.02296E+01	2.2293E+01	1.4825E+04	4.8095E+00	0.000E+00	1.980E+00
6.692609E-01	3.20850E+01	2.0854E+01	1.2973E+04	5.0267E+00	0.000E+00	1.853E+00
7.154399E-01	3.35416E+01	1.9435E+01	1.1310E+04	5.2358E+00	0.000E+00	1.733E+00
7.648052E-01	3.47170E+01	1.8073E+01	9.8386E+03	5.4350E+00	0.000E+00	1.621E+00
8.175768E-01	3.56847E+01	1.6761E+01	8.5354E+03	5.6229E+00	0.000E+00	1.516E+00
8.739896E-01	3.64799E+01	1.5496E+01	7.3822E+03	5.7980E+00	0.000E+00	1.419E+00
9.342948E-01	3.71117E+01	1.4312E+01	6.3779E+03	5.9588E+00	0.000E+00	1.327E+00
9.987612E-01	3.76704E+01	1.3210E+01	5.5067E+03	6.1041E+00	0.000E+00	1.241E+00
1.067676E+00	3.80802E+01	1.2096E+01	4.7168E+03	6.2328E+00	0.000E+00	1.161E+00
1.141345E+00	3.83830E+01	1.1038E+01	4.0266E+03	6.3439E+00	0.000E+00	1.086E+00
1.220098E+00	3.85496E+01	9.9896E+00	3.4089E+03	6.4366E+00	0.000E+00	1.016E+00
1.304285E+00	3.86027E+01	9.0550E+00	2.8905E+03	6.5102E+00	0.000E+00	9.506E-01
1.394281E+00	3.85796E+01	8.2212E+00	2.4549E+03	6.5644E+00	0.000E+00	8.892E-01
1.490486E+00	3.84965E+01	7.4755E+00	2.0882E+03	6.5988E+00	0.000E+00	8.318E-01
1.593329E+00	3.83601E+01	6.8087E+00	1.7792E+03	6.6133E+00	0.000E+00	7.781E-01
1.703269E+00	3.81767E+01	6.2118E+00	1.5184E+03	6.6080E+00	0.000E+00	7.279E-01
1.820795E+00	3.79482E+01	5.6769E+00	1.2981E+03	6.5832E+00	0.000E+00	6.809E-01
1.946430E+00	3.76565E+01	5.1681E+00	1.1055E+03	6.5394E+00	0.000E+00	6.370E-01
2.080733E+00	3.72619E+01	4.6920E+00	9.3886E+02	6.4772E+00	0.000E+00	5.959E-01
2.224304E+00	3.67266E+01	4.2654E+00	7.9841E+02	6.3972E+00	0.000E+00	5.574E-01
2.377781E+00	3.59697E+01	3.8813E+00	6.7961E+02	6.3005E+00	0.000E+00	5.214E-01

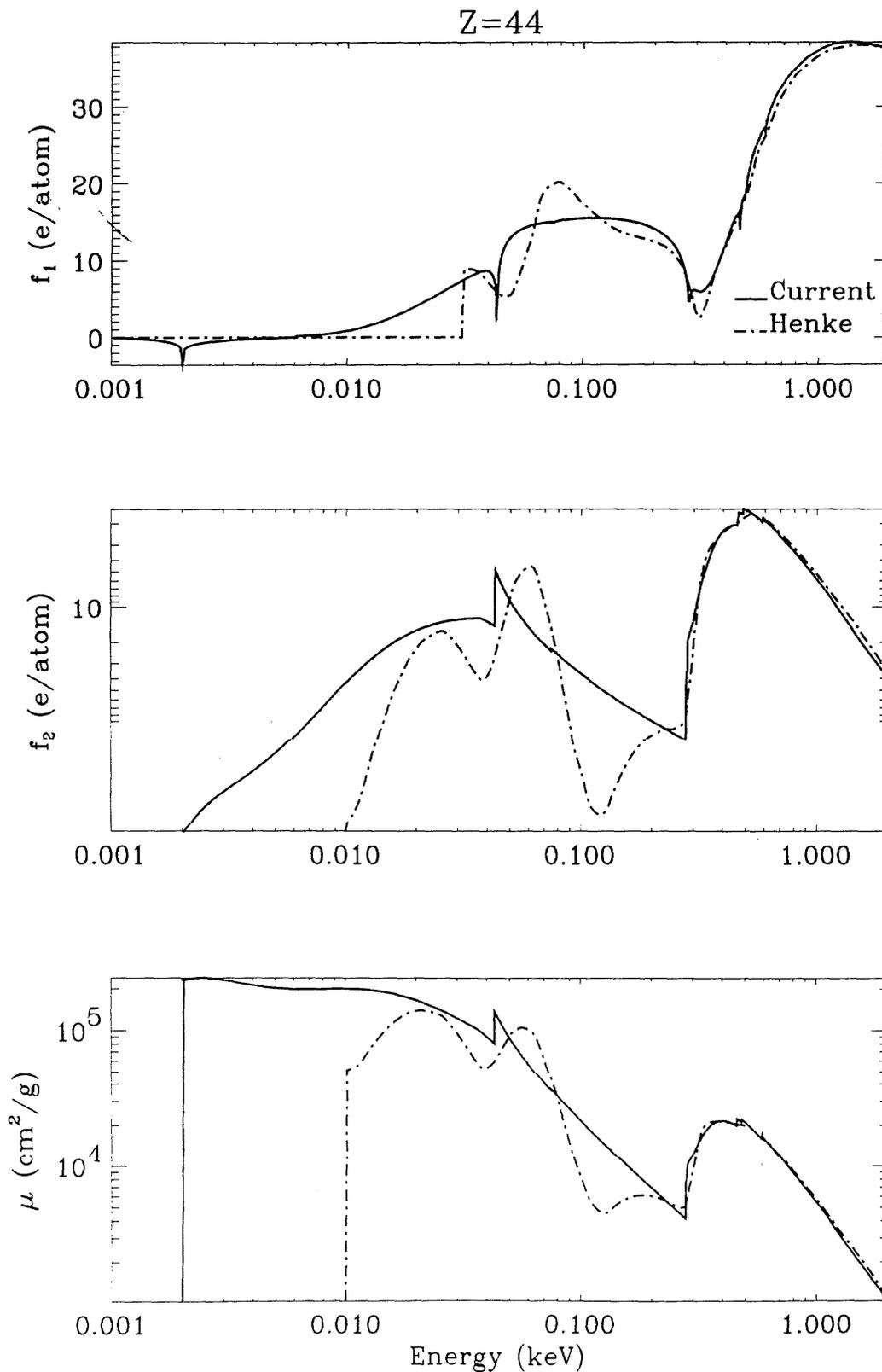
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 331

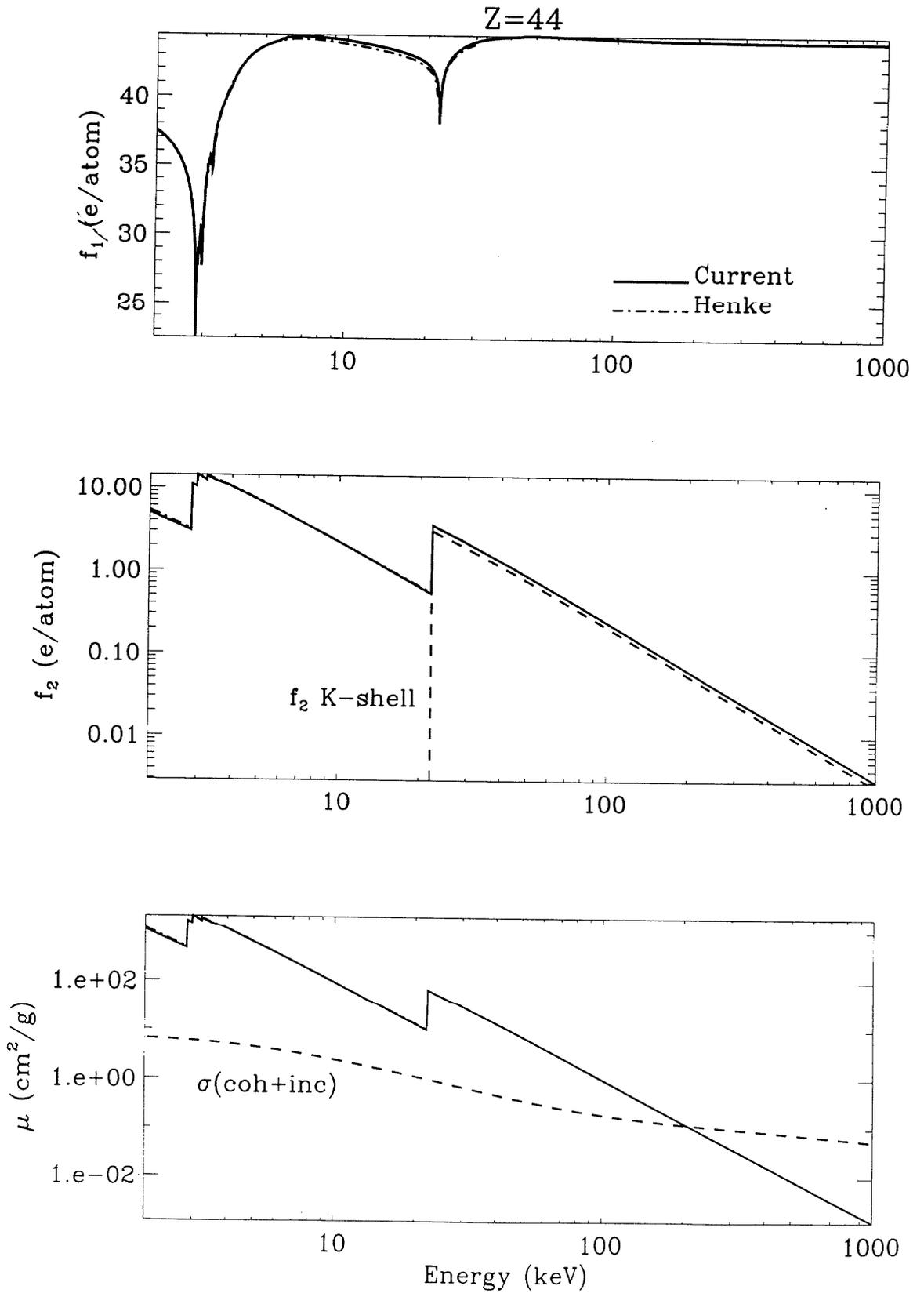
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.541848E+00	3.47747E+01	3.5320E+00	5.7854E+02	6.1881E+00	0.000E+00	4.878E-01
2.717235E+00	3.22942E+01	3.2179E+00	4.9306E+02	6.0609E+00	0.000E+00	4.563E-01
2.781142E+00	3.02369E+01	3.1159E+00	4.6646E+02	6.0134E+00	0.000E+00	4.458E-01
2.823710E+00	2.65904E+01	3.0513E+00	4.4990E+02	5.9815E+00	0.000E+00	4.391E-01
2.835062E+00	2.24727E+01	3.0344E+00	4.4563E+02	5.9730E+00	0.000E+00	4.373E-01
2.852089E+00	2.63780E+01	1.0932E+01	1.5959E+03	5.9602E+00	0.000E+00	4.347E-01
2.894658E+00	2.95073E+01	1.0698E+01	1.5387E+03	5.9280E+00	0.000E+00	4.283E-01
2.904724E+00	2.97685E+01	1.0643E+01	1.5256E+03	5.9204E+00	0.000E+00	4.268E-01
2.907562E+00	2.98248E+01	1.0628E+01	1.5219E+03	5.9182E+00	0.000E+00	4.264E-01
2.952066E+00	2.94490E+01	1.0395E+01	1.4660E+03	5.8844E+00	0.000E+00	4.200E-01
2.963933E+00	2.76815E+01	1.0334E+01	1.4516E+03	5.8754E+00	0.000E+00	4.183E-01
2.981735E+00	2.99606E+01	1.4292E+01	1.9956E+03	5.8618E+00	0.000E+00	4.158E-01
3.026238E+00	3.27712E+01	1.4151E+01	1.9469E+03	5.8279E+00	0.000E+00	4.097E-01
3.105150E+00	3.49892E+01	1.3295E+01	1.7826E+03	5.7676E+00	0.000E+00	3.993E-01
3.159520E+00	3.56507E+01	1.2738E+01	1.6785E+03	5.7261E+00	0.000E+00	3.924E-01
3.207880E+00	3.55236E+01	1.2272E+01	1.5928E+03	5.6891E+00	0.000E+00	3.865E-01
3.220776E+00	3.47222E+01	1.2154E+01	1.5711E+03	5.6793E+00	0.000E+00	3.850E-01
3.240120E+00	3.58840E+01	1.3854E+01	1.7803E+03	5.6645E+00	0.000E+00	3.827E-01
3.288480E+00	3.71842E+01	1.3431E+01	1.7005E+03	5.6276E+00	0.000E+00	3.770E-01
3.319406E+00	3.76671E+01	1.3184E+01	1.6536E+03	5.6041E+00	0.000E+00	3.735E-01
3.548445E+00	3.95868E+01	1.1858E+01	1.3914E+03	5.4310E+00	0.000E+00	3.494E-01
3.793288E+00	4.08496E+01	1.1047E+01	1.2125E+03	5.2499E+00	0.000E+00	3.269E-01
4.055024E+00	4.20086E+01	1.0035E+01	1.0303E+03	5.0621E+00	0.000E+00	3.058E-01
4.334821E+00	4.27363E+01	9.0167E+00	8.6603E+02	4.8689E+00	0.000E+00	2.860E-01
4.633924E+00	4.32299E+01	8.0998E+00	7.2775E+02	4.6717E+00	0.000E+00	2.676E-01
4.953664E+00	4.35730E+01	7.2799E+00	6.1186E+02	4.4718E+00	0.000E+00	2.503E-01
5.295467E+00	4.38127E+01	6.5464E+00	5.1470E+02	4.2704E+00	0.000E+00	2.341E-01
5.660855E+00	4.39808E+01	5.8883E+00	4.3308E+02	4.0687E+00	0.000E+00	2.190E-01
6.051453E+00	4.42178E+01	5.2718E+00	3.6271E+02	3.8678E+00	0.000E+00	2.049E-01
6.469004E+00	4.43028E+01	4.7148E+00	3.0345E+02	3.6687E+00	0.000E+00	1.917E-01
6.915365E+00	4.43118E+01	4.2116E+00	2.5357E+02	3.4723E+00	0.000E+00	1.793E-01
7.392525E+00	4.42900E+01	3.7656E+00	2.1208E+02	3.2796E+00	0.000E+00	1.677E-01
7.902609E+00	4.42488E+01	3.3700E+00	1.7755E+02	3.0912E+00	0.000E+00	1.569E-01
8.447890E+00	4.41964E+01	3.0188E+00	1.4878E+02	2.9078E+00	0.000E+00	1.468E-01
9.030794E+00	4.41479E+01	2.6988E+00	1.2442E+02	2.7300E+00	0.000E+00	1.373E-01
9.653919E+00	4.40745E+01	2.3932E+00	1.0321E+02	2.5583E+00	0.000E+00	1.284E-01
1.032004E+01	4.39861E+01	2.1242E+00	8.5697E+01	2.3931E+00	0.000E+00	1.201E-01
1.103212E+01	4.38895E+01	1.8872E+00	7.1222E+01	2.2347E+00	0.000E+00	1.124E-01
1.179334E+01	4.37875E+01	1.6774E+00	5.9217E+01	2.0833E+00	0.000E+00	1.051E-01
1.260708E+01	4.36812E+01	1.4903E+00	4.9218E+01	1.9391E+00	0.000E+00	9.834E-02
1.347697E+01	4.35675E+01	1.3210E+00	4.0811E+01	1.8021E+00	0.000E+00	9.200E-02
1.440688E+01	4.34440E+01	1.1691E+00	3.3786E+01	1.6725E+00	0.000E+00	8.606E-02
1.540095E+01	4.33048E+01	1.0329E+00	2.7923E+01	1.5502E+00	0.000E+00	8.050E-02
1.646362E+01	4.31438E+01	9.1336E-01	2.3098E+01	1.4351E+00	0.000E+00	7.531E-02
1.759961E+01	4.29479E+01	8.0840E-01	1.9124E+01	1.3271E+00	0.000E+00	7.045E-02
1.881398E+01	4.26871E+01	7.1616E-01	1.5848E+01	1.2260E+00	0.000E+00	6.590E-02
2.011215E+01	4.22765E+01	6.3499E-01	1.3145E+01	1.1317E+00	0.000E+00	6.165E-02
2.149988E+01	4.12619E+01	5.6348E-01	1.0912E+01	1.0438E+00	0.000E+00	5.767E-02
2.167486E+01	4.09604E+01	5.5540E-01	1.0668E+01	1.0336E+00	0.000E+00	5.720E-02
2.200661E+01	3.96567E+01	5.4057E-01	1.0227E+01	1.0147E+00	0.000E+00	5.634E-02
2.209508E+01	3.80877E+01	5.3673E-01	1.0114E+01	1.0097E+00	0.000E+00	5.611E-02
2.222779E+01	3.96841E+01	3.6233E+00	6.7868E+01	1.0024E+00	5.792E+01	5.578E-02
2.255954E+01	4.11276E+01	3.5276E+00	6.5103E+01	9.8440E-01	5.556E+01	5.496E-02
2.298338E+01	4.18441E+01	3.4109E+00	6.1789E+01	9.6226E-01	5.272E+01	5.395E-02
2.456923E+01	4.29361E+01	3.0547E+00	5.1765E+01	8.8667E-01	4.423E+01	5.046E-02
2.626450E+01	4.34577E+01	2.7483E+00	4.3567E+01	8.1679E-01	3.729E+01	4.721E-02
2.807676E+01	4.37905E+01	2.4608E+00	3.6492E+01	7.5234E-01	3.132E+01	4.416E-02
3.001405E+01	4.40056E+01	2.1940E+00	3.0434E+01	6.9303E-01	2.619E+01	4.131E-02
3.208502E+01	4.41468E+01	1.9540E+00	2.5355E+01	6.3854E-01	2.187E+01	3.864E-02
3.429889E+01	4.42409E+01	1.7404E+00	2.1127E+01	5.8859E-01	1.826E+01	3.615E-02
3.666551E+01	4.43031E+01	1.5504E+00	1.7605E+01	5.4288E-01	1.525E+01	3.381E-02
3.919543E+01	4.43430E+01	1.3813E+00	1.4672E+01	5.0113E-01	1.273E+01	3.163E-02
4.189992E+01	4.43672E+01	1.2307E+00	1.2229E+01	4.6306E-01	1.063E+01	2.959E-02
4.479101E+01	4.44150E+01	1.0952E+00	1.0180E+01	4.2839E-01	8.862E+00	2.768E-02
4.788159E+01	4.44167E+01	9.6878E-01	8.4239E+00	3.9686E-01	7.336E+00	2.589E-02

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_x cm ² /g	λ nm
5.118542E+01	4.44093E+01	8.5705E-01	6.9713E+00	3.6822E-01	6.073E+00	2.422E-02
5.471721E+01	4.43964E+01	7.5827E-01	5.7697E+00	3.4224E-01	5.028E+00	2.266E-02
5.849270E+01	4.43798E+01	6.7093E-01	4.7756E+00	3.1868E-01	4.162E+00	2.120E-02
6.252870E+01	4.43612E+01	5.9365E-01	3.9528E+00	2.9735E-01	3.446E+00	1.983E-02
6.684318E+01	4.43413E+01	5.2527E-01	3.2718E+00	2.7803E-01	2.853E+00	1.855E-02
7.145536E+01	4.43209E+01	4.6455E-01	2.7068E+00	2.6054E-01	2.362E+00	1.735E-02
7.638578E+01	4.43008E+01	4.1073E-01	2.2387E+00	2.4471E-01	1.955E+00	1.623E-02
8.165640E+01	4.42821E+01	3.6268E-01	1.8492E+00	2.3037E-01	1.616E+00	1.518E-02
8.729069E+01	4.42620E+01	3.1930E-01	1.5230E+00	2.1738E-01	1.332E+00	1.420E-02
9.331374E+01	4.42424E+01	2.8113E-01	1.2543E+00	2.0560E-01	1.097E+00	1.329E-02
9.975239E+01	4.42236E+01	2.4728E-01	1.0321E+00	1.9491E-01	9.031E-01	1.243E-02
1.066353E+02	4.42056E+01	2.1738E-01	8.4874E-01	1.8518E-01	7.427E-01	1.163E-02
1.139931E+02	4.41885E+01	1.9110E-01	6.9797E-01	1.7632E-01	6.108E-01	1.088E-02
1.218587E+02	4.41724E+01	1.6801E-01	5.7402E-01	1.6822E-01	5.023E-01	1.017E-02
1.302669E+02	4.41573E+01	1.4771E-01	4.7210E-01	1.6081E-01	4.131E-01	9.518E-03
1.392553E+02	4.41433E+01	1.2987E-01	3.8829E-01	1.5400E-01	3.397E-01	8.903E-03
1.488640E+02	4.41304E+01	1.1419E-01	3.1938E-01	1.4773E-01	2.794E-01	8.329E-03
1.591356E+02	4.41184E+01	1.0041E-01	2.6270E-01	1.4193E-01	2.298E-01	7.791E-03
1.701159E+02	4.41074E+01	8.8295E-02	2.1610E-01	1.3654E-01	1.890E-01	7.288E-03
1.818539E+02	4.40973E+01	7.7645E-02	1.7777E-01	1.3152E-01	1.554E-01	6.818E-03
1.944018E+02	4.40881E+01	6.8282E-02	1.4624E-01	1.2682E-01	1.278E-01	6.378E-03
2.078156E+02	4.40796E+01	6.0050E-02	1.2031E-01	1.2240E-01	1.051E-01	5.966E-03
2.221548E+02	4.40719E+01	5.2813E-02	9.8979E-02	1.1823E-01	8.644E-02	5.581E-03
2.374835E+02	4.40649E+01	4.6449E-02	8.1433E-02	1.1427E-01	7.109E-02	5.221E-03
2.538699E+02	4.40585E+01	4.0854E-02	6.7001E-02	1.1051E-01	5.847E-02	4.884E-03
2.713869E+02	4.40527E+01	3.5934E-02	5.5128E-02	1.0692E-01	4.808E-02	4.569E-03
2.901126E+02	4.40475E+01	3.1607E-02	4.5360E-02	1.0347E-01	3.954E-02	4.274E-03
3.101304E+02	4.40427E+01	2.7802E-02	3.7324E-02	1.0016E-01	3.252E-02	3.998E-03
3.315294E+02	4.40384E+01	2.4456E-02	3.0713E-02	9.6960E-02	2.674E-02	3.740E-03
3.544049E+02	4.40345E+01	2.1513E-02	2.5274E-02	9.3866E-02	2.199E-02	3.498E-03
3.788588E+02	4.40310E+01	1.8925E-02	2.0798E-02	9.0867E-02	1.809E-02	3.273E-03
4.050001E+02	4.40278E+01	1.6649E-02	1.7116E-02	8.7952E-02	1.488E-02	3.061E-03
4.329451E+02	4.40250E+01	1.4647E-02	1.4085E-02	8.5115E-02	1.223E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 335

Rh **Z = 45**

Atomic weight = 1.029055E+02 g/mol, nominal density ρ (g/cm³) = 1.2390E+01

μ_k (barns/atom) = μ (cm²/g) \times 1.70879E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 4.08922E+05

14 edges. Edge energies (keV):

K		2.32199E+00	L	I	3.41190E+00	L	II	3.14610E+00	L	III	3.00380E+00
M	I	6.27100E-00	M	II	5.21000E-00	M	III	4.96200E-00	M	IV	3.11700E-01
M	V	3.07000E-00	N	I	8.10000E-02	N	II	4.79000E-02	N	III	4.79000E-02
N	IV	2.50000E-03	N	V	2.50000E-03						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -4.0814E-01, -2.5440E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.0795E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	1.89417E+00	4.8055E+00	1.8382E+05	1.1514E-04	0.000E+00	1.160E+02
1.142761E-02	2.09662E+00	5.1028E+00	1.8260E+05	1.5865E-04	0.000E+00	1.085E+02
1.221612E-02	2.32705E+00	5.4019E+00	1.8082E+05	2.1741E-04	0.000E+00	1.015E+02
1.305903E-02	2.58575E+00	5.6998E+00	1.7848E+05	2.9628E-04	0.000E+00	9.494E+01
1.396010E-02	2.87263E+00	5.9931E+00	1.7555E+05	4.0158E-04	0.000E+00	8.881E+01
1.492335E-02	3.18714E+00	6.2786E+00	1.7204E+05	5.4136E-04	0.000E+00	8.308E+01
1.595306E-02	3.52819E+00	6.5531E+00	1.6797E+05	7.2588E-04	0.000E+00	7.772E+01
1.705382E-02	3.89415E+00	6.8134E+00	1.6337E+05	9.6809E-04	0.000E+00	7.270E+01
1.823053E-02	4.28288E+00	7.0566E+00	1.5828E+05	1.2843E-03	0.000E+00	6.801E+01
1.948844E-02	4.69173E+00	7.2804E+00	1.5276E+05	1.6947E-03	0.000E+00	6.362E+01
2.083314E-02	5.11762E+00	7.4824E+00	1.4687E+05	2.2247E-03	0.000E+00	5.951E+01
2.227063E-02	5.55710E+00	7.6611E+00	1.4067E+05	2.9052E-03	0.000E+00	5.567E+01
2.380730E-02	6.00634E+00	7.8152E+00	1.3424E+05	3.7742E-03	0.000E+00	5.208E+01
2.545001E-02	6.46121E+00	7.9443E+00	1.2765E+05	4.8779E-03	0.000E+00	4.872E+01
2.720606E-02	6.91721E+00	8.0481E+00	1.2097E+05	6.2722E-03	0.000E+00	4.557E+01
2.908327E-02	7.36933E+00	8.1270E+00	1.1427E+05	8.0242E-03	0.000E+00	4.263E+01
3.109002E-02	7.81174E+00	8.1819E+00	1.0762E+05	1.0214E-02	0.000E+00	3.988E+01
3.323523E-02	8.23697E+00	8.2140E+00	1.0106E+05	1.2936E-02	0.000E+00	3.731E+01
3.552846E-02	8.63416E+00	8.2249E+00	9.4666E+04	1.6302E-02	0.000E+00	3.490E+01
3.797993E-02	8.98459E+00	8.2164E+00	8.8465E+04	2.0443E-02	0.000E+00	3.264E+01
4.060054E-02	9.24829E+00	8.1907E+00	8.2495E+04	2.5510E-02	0.000E+00	3.054E+01
4.340198E-02	9.53105E+00	8.1499E+00	7.6786E+04	3.1677E-02	0.000E+00	2.857E+01
4.639671E-02	8.53632E+00	8.0962E+00	7.1357E+04	3.9146E-02	0.000E+00	2.672E+01
4.694200E-02	8.00116E+00	8.0857E+00	7.0436E+04	4.0604E-02	0.000E+00	2.641E+01
4.766050E-02	5.95081E+00	8.0228E+00	6.8835E+04	4.2572E-02	0.000E+00	2.601E+01
4.785210E-02	3.21176E+00	8.0060E+00	6.8416E+04	4.3105E-02	0.000E+00	2.591E+01
4.813950E-02	6.39978E+00	1.3516E+01	1.1482E+05	4.3913E-02	0.000E+00	2.576E+01
4.885800E-02	9.28778E+00	1.3044E+01	1.0917E+05	4.5969E-02	0.000E+00	2.538E+01
4.959809E-02	1.05693E+01	1.2595E+01	1.0384E+05	4.8142E-02	0.000E+00	2.500E+01
5.302035E-02	1.29851E+01	1.0918E+01	8.4209E+04	5.8924E-02	0.000E+00	2.338E+01
5.667876E-02	1.38997E+01	9.7195E+00	7.0124E+04	7.1779E-02	0.000E+00	2.187E+01
6.058959E-02	1.44010E+01	8.8533E+00	5.9751E+04	8.7027E-02	0.000E+00	2.046E+01
6.477028E-02	1.47360E+01	8.1819E+00	5.1656E+04	1.0502E-01	0.000E+00	1.914E+01
6.923942E-02	1.49838E+01	7.6317E+00	4.5072E+04	1.2615E-01	0.000E+00	1.791E+01
7.401695E-02	1.51694E+01	7.1613E+00	3.9564E+04	1.5083E-01	0.000E+00	1.675E+01
7.912411E-02	1.52714E+01	6.7471E+00	3.4870E+04	1.7951E-01	0.000E+00	1.567E+01
7.938000E-02	1.52708E+01	6.7282E+00	3.4660E+04	1.8101E-01	0.000E+00	1.562E+01
8.059500E-02	1.52279E+01	6.6405E+00	3.3693E+04	1.8820E-01	0.000E+00	1.538E+01
8.091900E-02	1.51480E+01	6.6177E+00	3.3443E+04	1.9014E-01	0.000E+00	1.532E+01
8.140500E-02	1.52468E+01	6.7567E+00	3.3941E+04	1.9306E-01	0.000E+00	1.523E+01
8.262000E-02	1.53518E+01	6.6791E+00	3.3058E+04	2.0046E-01	0.000E+00	1.501E+01
8.458368E-02	1.54415E+01	6.5600E+00	3.1715E+04	2.1268E-01	0.000E+00	1.466E+01
9.041995E-02	1.56159E+01	6.2449E+00	2.8242E+04	2.5084E-01	0.000E+00	1.371E+01
9.665893E-02	1.57489E+01	5.9577E+00	2.5205E+04	2.9453E-01	0.000E+00	1.283E+01
1.033284E-01	1.58551E+01	5.6935E+00	2.2532E+04	3.4429E-01	0.000E+00	1.200E+01
1.104581E-01	1.59375E+01	5.4491E+00	2.0173E+04	4.0069E-01	0.000E+00	1.122E+01
1.180797E-01	1.59967E+01	5.2222E+00	1.8085E+04	4.6429E-01	0.000E+00	1.050E+01
1.262272E-01	1.60318E+01	5.0111E+00	1.6234E+04	5.3565E-01	0.000E+00	9.822E+00
1.349368E-01	1.60413E+01	4.8142E+00	1.4589E+04	6.1531E-01	0.000E+00	9.188E+00
1.442475E-01	1.60170E+01	4.6301E+00	1.3126E+04	7.0381E-01	0.000E+00	8.595E+00
1.542005E-01	1.59658E+01	4.4576E+00	1.1821E+04	8.0162E-01	0.000E+00	8.040E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.64840E-01	1.58769E+01	4.2954E+00	1.0656E+04	9.0919E-01	0.000E+00	7.521E+00
1.762144E-01	1.57426E+01	4.1424E+00	9.6128E+03	1.0269E+00	0.000E+00	7.036E+00
1.883732E-01	1.55526E+01	3.9976E+00	8.6779E+03	1.1550E+00	0.000E+00	6.582E+00
2.013709E-01	1.52919E+01	3.8596E+00	7.8376E+03	1.2938E+00	0.000E+00	6.157E+00
2.152655E-01	1.49381E+01	3.7268E+00	7.0795E+03	1.4434E+00	0.000E+00	5.760E+00
2.301188E-01	1.44564E+01	3.5984E+00	6.3944E+03	1.6038E+00	0.000E+00	5.388E+00
2.459970E-01	1.37917E+01	3.4736E+00	5.7742E+03	1.7749E+00	0.000E+00	5.040E+00
2.629708E-01	1.28315E+01	3.3517E+00	5.2120E+03	1.9564E+00	0.000E+00	4.715E+00
2.811158E-01	1.13237E+01	3.2323E+00	4.7018E+03	2.1479E+00	0.000E+00	4.410E+00
3.005128E-01	8.15945E+00	3.1149E+00	4.2385E+03	2.3491E+00	0.000E+00	4.126E+00
3.008600E-01	8.05768E+00	3.1128E+00	4.2309E+03	2.3526E+00	0.000E+00	4.121E+00
3.054660E-01	5.95237E+00	3.0864E+00	4.1317E+03	2.3998E+00	0.000E+00	4.059E+00
3.066930E-01	4.17242E+00	3.0794E+00	4.1058E+03	2.4123E+00	0.000E+00	4.043E+00
3.085350E-01	5.06359E+00	6.0229E+00	7.9825E+03	2.4310E+00	0.000E+00	4.018E+00
3.101415E-01	5.04698E+00	6.1078E+00	8.0532E+03	2.4473E+00	0.000E+00	3.998E+00
3.113883E-01	4.14952E+00	6.1755E+00	8.1098E+03	2.4599E+00	0.000E+00	3.982E+00
3.132585E-01	5.23483E+00	8.3433E+00	1.0891E+04	2.4788E+00	0.000E+00	3.958E+00
3.179340E-01	6.10712E+00	8.8068E+00	1.1327E+04	2.5259E+00	0.000E+00	3.900E+00
3.212482E-01	6.30213E+00	9.1580E+00	1.1657E+04	2.5591E+00	0.000E+00	3.859E+00
3.434143E-01	6.53387E+00	1.2030E+01	1.4325E+04	2.7772E+00	0.000E+00	3.610E+00
3.671099E-01	7.46300E+00	1.5371E+01	1.7121E+04	3.0025E+00	0.000E+00	3.377E+00
3.924405E-01	9.35507E+00	1.8361E+01	1.9132E+04	3.2338E+00	0.000E+00	3.159E+00
4.195189E-01	1.19079E+01	2.0619E+01	2.0099E+04	3.4698E+00	0.000E+00	2.955E+00
4.484657E-01	1.46475E+01	2.1977E+01	2.0039E+04	3.7094E+00	0.000E+00	2.765E+00
4.794098E-01	1.67922E+01	2.2452E+01	1.9151E+04	3.9509E+00	0.000E+00	2.586E+00
4.862760E-01	1.69162E+01	2.2452E+01	1.8880E+04	4.0025E+00	0.000E+00	2.550E+00
4.937190E-01	1.62427E+01	2.2416E+01	1.8566E+04	4.0576E+00	0.000E+00	2.511E+00
4.957038E-01	1.48958E+01	2.2401E+01	1.8479E+04	4.0721E+00	0.000E+00	2.501E+00
4.986810E-01	1.66220E+01	2.5308E+01	2.0753E+04	4.0939E+00	0.000E+00	2.486E+00
5.061240E-01	1.84232E+01	2.5227E+01	2.0382E+04	4.1476E+00	0.000E+00	2.450E+00
5.105800E-01	1.90150E+01	2.5166E+01	2.0155E+04	4.1793E+00	0.000E+00	2.428E+00
5.124891E-01	1.92134E+01	2.5137E+01	2.0057E+04	4.1929E+00	0.000E+00	2.419E+00
5.183950E-01	1.95194E+01	2.5037E+01	1.9749E+04	4.2343E+00	0.000E+00	2.392E+00
5.204790E-01	1.91250E+01	2.4998E+01	1.9640E+04	4.2488E+00	0.000E+00	2.382E+00
5.236050E-01	2.01348E+01	2.6203E+01	2.0464E+04	4.2705E+00	0.000E+00	2.368E+00
5.314200E-01	2.15333E+01	2.6042E+01	2.0039E+04	4.3240E+00	0.000E+00	2.333E+00
5.478508E-01	2.34547E+01	2.5646E+01	1.9143E+04	4.4336E+00	0.000E+00	2.263E+00
5.856525E-01	2.65544E+01	2.4527E+01	1.7126E+04	4.6714E+00	0.000E+00	2.117E+00
6.145580E-01	2.80923E+01	2.3568E+01	1.5682E+04	4.8404E+00	0.000E+00	2.017E+00
6.239645E-01	2.81885E+01	2.3249E+01	1.5236E+04	4.8931E+00	0.000E+00	1.987E+00
6.260625E-01	2.79470E+01	2.3177E+01	1.5139E+04	4.9047E+00	0.000E+00	1.980E+00
6.264729E-01	2.78066E+01	2.3163E+01	1.5120E+04	4.9069E+00	0.000E+00	1.979E+00
6.302355E-01	2.85331E+01	2.4053E+01	1.5606E+04	4.9276E+00	0.000E+00	1.967E+00
6.396420E-01	2.94719E+01	2.3731E+01	1.5171E+04	4.9784E+00	0.000E+00	1.938E+00
6.692609E-01	3.12211E+01	2.2730E+01	1.3888E+04	5.1315E+00	0.000E+00	1.853E+00
7.154399E-01	3.31285E+01	2.1237E+01	1.2138E+04	5.3502E+00	0.000E+00	1.733E+00
7.648052E-01	3.46156E+01	1.9768E+01	1.0570E+04	5.5591E+00	0.000E+00	1.621E+00
8.175768E-01	3.58079E+01	1.8361E+01	9.1834E+03	5.7565E+00	0.000E+00	1.516E+00
8.739896E-01	3.67848E+01	1.7016E+01	7.9617E+03	5.9408E+00	0.000E+00	1.419E+00
9.342948E-01	3.75849E+01	1.5729E+01	6.8843E+03	6.1106E+00	0.000E+00	1.327E+00
9.987612E-01	3.82442E+01	1.4525E+01	5.9471E+03	6.2646E+00	0.000E+00	1.241E+00
1.067676E+00	3.87727E+01	1.3315E+01	5.0997E+03	6.4014E+00	0.000E+00	1.161E+00
1.141345E+00	3.91539E+01	1.2186E+01	4.3659E+03	6.5202E+00	0.000E+00	1.086E+00
1.220098E+00	3.94325E+01	1.1140E+01	3.7337E+03	6.6199E+00	0.000E+00	1.016E+00
1.304285E+00	3.96085E+01	1.0098E+01	3.1661E+03	6.6999E+00	0.000E+00	9.506E-01
1.394281E+00	3.96637E+01	9.1498E+00	2.6835E+03	6.7597E+00	0.000E+00	8.892E-01
1.490486E+00	3.96411E+01	8.3038E+00	2.2782E+03	6.7989E+00	0.000E+00	8.318E-01
1.593329E+00	3.95546E+01	7.5479E+00	1.9371E+03	6.8175E+00	0.000E+00	7.781E-01
1.703269E+00	3.94114E+01	6.8721E+00	1.6499E+03	6.8154E+00	0.000E+00	7.279E-01
1.820795E+00	3.92194E+01	6.2674E+00	1.4076E+03	6.7930E+00	0.000E+00	6.809E-01
1.946430E+00	3.89783E+01	5.7258E+00	1.2029E+03	6.7507E+00	0.000E+00	6.370E-01
2.080733E+00	3.86746E+01	5.2173E+00	1.0253E+03	6.6891E+00	0.000E+00	5.959E-01
2.224304E+00	3.82656E+01	4.7367E+00	8.7081E+02	6.6089E+00	0.000E+00	5.574E-01
2.377781E+00	3.77071E+01	4.3058E+00	7.4049E+02	6.5112E+00	0.000E+00	5.214E-01
2.541848E+00	3.69090E+01	3.9180E+00	6.3032E+02	6.3968E+00	0.000E+00	4.878E-01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 337

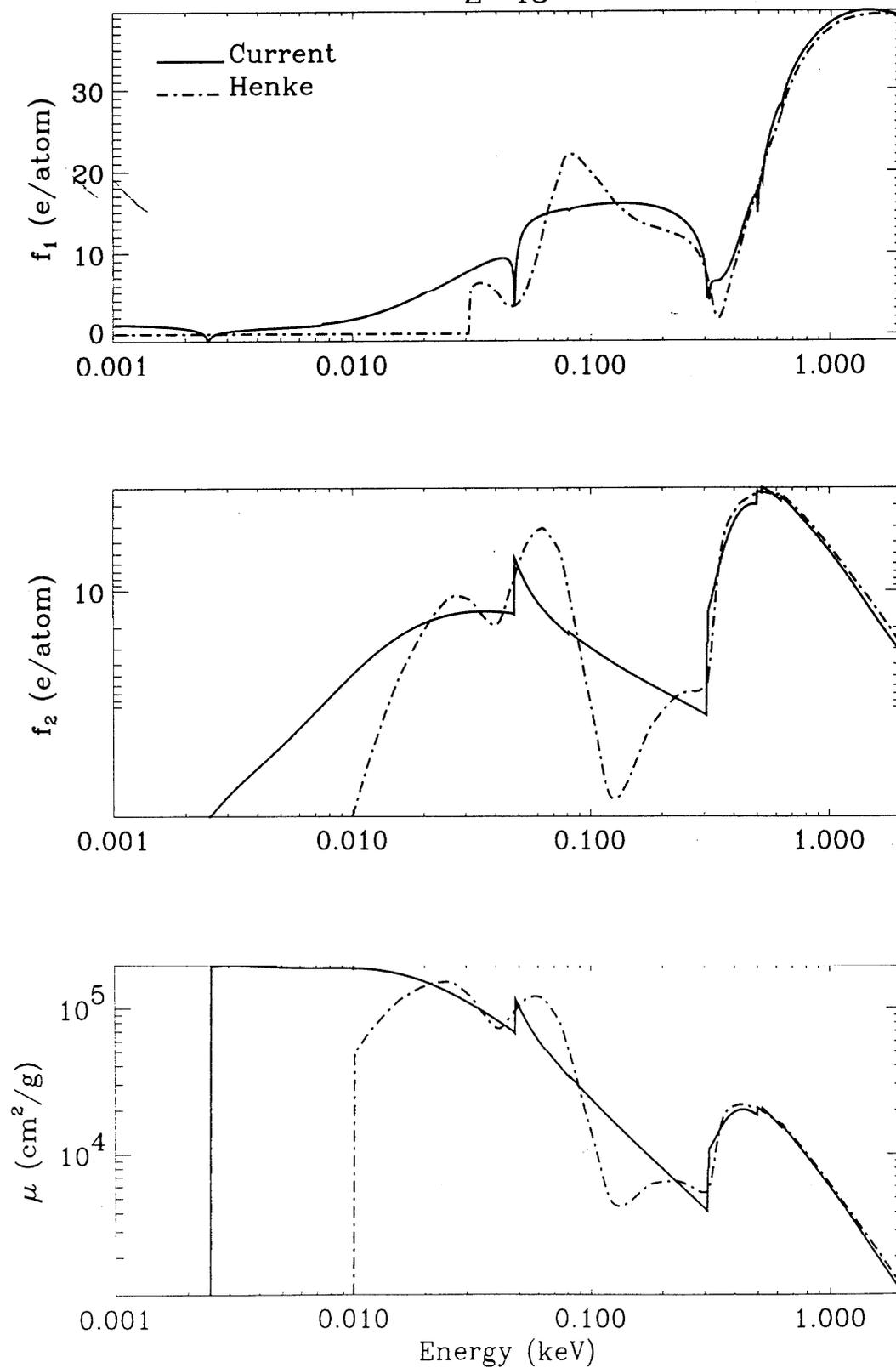
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

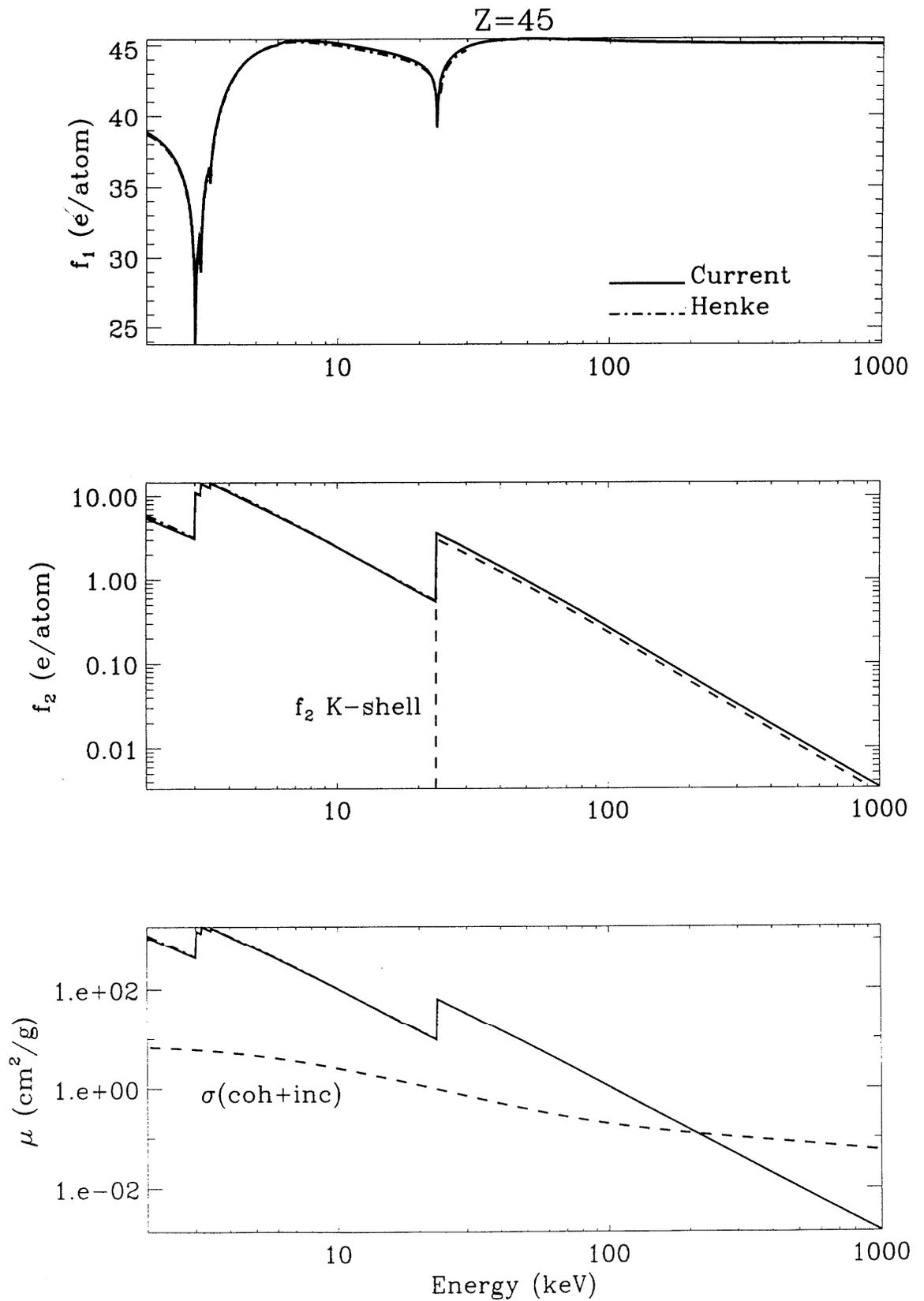
E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
2.717235E+00	3.56223E+01	3.5657E+00	5.3661E+02	6.2671E+00	0.000E+00	4.563E-01
2.904724E+00	3.27378E+01	3.2488E+00	4.5736E+02	6.1232E+00	0.000E+00	4.268E-01
2.943724E+00	3.14079E+01	3.1893E+00	4.4304E+02	6.0929E+00	0.000E+00	4.212E-01
2.988781E+00	2.78447E+01	3.1231E+00	4.2730E+02	6.0577E+00	0.000E+00	4.148E-01
3.000796E+00	2.38203E+01	3.1056E+00	4.2320E+02	6.0483E+00	0.000E+00	4.132E-01
3.018819E+00	2.76279E+01	1.0824E+01	1.4662E+03	6.0342E+00	0.000E+00	4.107E-01
3.063876E+00	3.07009E+01	1.0604E+01	1.4152E+03	5.9989E+00	0.000E+00	4.047E-01
3.083178E+00	3.11221E+01	1.0512E+01	1.3942E+03	5.9837E+00	0.000E+00	4.021E-01
3.105150E+00	3.12624E+01	1.0409E+01	1.3707E+03	5.9665E+00	0.000E+00	3.993E-01
3.130370E+00	3.07066E+01	1.0293E+01	1.3446E+03	5.9467E+00	0.000E+00	3.961E-01
3.142954E+00	2.89990E+01	1.0236E+01	1.3318E+03	5.9368E+00	0.000E+00	3.945E-01
3.161831E+00	3.12954E+01	1.3993E+01	1.8098E+03	5.9220E+00	0.000E+00	3.921E-01
3.209022E+00	3.37259E+01	1.3691E+01	1.7447E+03	5.8849E+00	0.000E+00	3.864E-01
3.319406E+00	3.59162E+01	1.3008E+01	1.6024E+03	5.7983E+00	0.000E+00	3.735E-01
3.343662E+00	3.61407E+01	1.2857E+01	1.5724E+03	5.7794E+00	0.000E+00	3.708E-01
3.394841E+00	3.60599E+01	1.2545E+01	1.5111E+03	5.7394E+00	0.000E+00	3.652E-01
3.408488E+00	3.52798E+01	1.2463E+01	1.4952E+03	5.7287E+00	0.000E+00	3.638E-01
3.428960E+00	3.64699E+01	1.4209E+01	1.6945E+03	5.7128E+00	0.000E+00	3.616E-01
3.480138E+00	3.78650E+01	1.3890E+01	1.6320E+03	5.6730E+00	0.000E+00	3.563E-01
3.548445E+00	3.89158E+01	1.3477E+01	1.5531E+03	5.6202E+00	0.000E+00	3.494E-01
3.793288E+00	4.11094E+01	1.2138E+01	1.3085E+03	5.4334E+00	0.000E+00	3.269E-01
4.055024E+00	4.24388E+01	1.0918E+01	1.1010E+03	5.2395E+00	0.000E+00	3.058E-01
4.334821E+00	4.33289E+01	9.8125E+00	9.2565E+02	5.0399E+00	0.000E+00	2.860E-01
4.633924E+00	4.39500E+01	8.8157E+00	7.7795E+02	4.8360E+00	0.000E+00	2.676E-01
4.953664E+00	4.43826E+01	7.9204E+00	6.5382E+02	4.6291E+00	0.000E+00	2.503E-01
5.295467E+00	4.46862E+01	7.1193E+00	5.4976E+02	4.4206E+00	0.000E+00	2.341E-01
5.660855E+00	4.48983E+01	6.4020E+00	4.6246E+02	4.2116E+00	0.000E+00	2.190E-01
6.051453E+00	4.51300E+01	5.7551E+00	3.8890E+02	4.0034E+00	0.000E+00	2.049E-01
6.469004E+00	4.52610E+01	5.1523E+00	3.2569E+02	3.7970E+00	0.000E+00	1.917E-01
6.915365E+00	4.53329E+01	4.6094E+00	2.7257E+02	3.5934E+00	0.000E+00	1.793E-01
7.392525E+00	4.53324E+01	4.1209E+00	2.2795E+02	3.3935E+00	0.000E+00	1.677E-01
7.902609E+00	4.53055E+01	3.6875E+00	1.9081E+02	3.1980E+00	0.000E+00	1.569E-01
8.447890E+00	4.52629E+01	3.3029E+00	1.5988E+02	3.0078E+00	0.000E+00	1.468E-01
9.030794E+00	4.52202E+01	2.9540E+00	1.3376E+02	2.8233E+00	0.000E+00	1.373E-01
9.653919E+00	4.51573E+01	2.6207E+00	1.1101E+02	2.6451E+00	0.000E+00	1.284E-01
1.032004E+01	4.50732E+01	2.3256E+00	9.2148E+01	2.4737E+00	0.000E+00	1.201E-01
1.103212E+01	4.49788E+01	2.0656E+00	7.6564E+01	2.3093E+00	0.000E+00	1.124E-01
1.179334E+01	4.48783E+01	1.8364E+00	6.3677E+01	2.1522E+00	0.000E+00	1.051E-01
1.260708E+01	4.47736E+01	1.6333E+00	5.2979E+01	2.0026E+00	0.000E+00	9.834E-02
1.347697E+01	4.46648E+01	1.4515E+00	4.4041E+01	1.8605E+00	0.000E+00	9.200E-02
1.440688E+01	4.45483E+01	1.2873E+00	3.6537E+01	1.7261E+00	0.000E+00	8.606E-02
1.540095E+01	4.44213E+01	1.1391E+00	3.0246E+01	1.5993E+00	0.000E+00	8.050E-02
1.646362E+01	4.42772E+01	1.0071E+00	2.5013E+01	1.4799E+00	0.000E+00	7.531E-02
1.759961E+01	4.41089E+01	8.9111E-01	2.0705E+01	1.3679E+00	0.000E+00	7.045E-02
1.881398E+01	4.39001E+01	7.8923E-01	1.7154E+01	1.2632E+00	0.000E+00	6.590E-02
2.011215E+01	4.36125E+01	6.9962E-01	1.4225E+01	1.1654E+00	0.000E+00	6.165E-02
2.149988E+01	4.31259E+01	6.2075E-01	1.1807E+01	1.0744E+00	0.000E+00	5.767E-02
2.275550E+01	4.19842E+01	5.6105E-01	1.0082E+01	1.0021E+00	0.000E+00	5.449E-02
2.298338E+01	4.13616E+01	5.5121E-01	9.8071E+00	9.8989E-01	0.000E+00	5.395E-02
2.310380E+01	4.06879E+01	5.4612E-01	9.6660E+00	9.8354E-01	0.000E+00	5.366E-02
2.319668E+01	3.91279E+01	5.4225E-01	9.5591E+00	9.7869E-01	0.000E+00	5.345E-02
2.333600E+01	4.07147E+01	3.6109E+00	6.3274E+01	9.7149E-01	5.387E+01	5.313E-02
2.368430E+01	4.21495E+01	3.5161E+00	6.0708E+01	9.5390E-01	5.168E+01	5.235E-02
2.456923E+01	4.32772E+01	3.2962E+00	5.4861E+01	9.1162E-01	4.671E+01	5.046E-02
2.626450E+01	4.41227E+01	2.9629E+00	4.6131E+01	8.3929E-01	3.935E+01	4.721E-02
2.807676E+01	4.45784E+01	2.6567E+00	3.8694E+01	7.7258E-01	3.311E+01	4.416E-02
3.001405E+01	4.48642E+01	2.3762E+00	3.2375E+01	7.1121E-01	2.779E+01	4.131E-02
3.208502E+01	4.50536E+01	2.1169E+00	2.6979E+01	6.5485E-01	2.321E+01	3.864E-02
3.429889E+01	4.51785E+01	1.8854E+00	2.2478E+01	6.0320E-01	1.938E+01	3.615E-02
3.666551E+01	4.52617E+01	1.6795E+00	1.8731E+01	5.5595E-01	1.618E+01	3.381E-02
3.919543E+01	4.53162E+01	1.4962E+00	1.5610E+01	5.1280E-01	1.351E+01	3.163E-02
4.189992E+01	4.53506E+01	1.3331E+00	1.3010E+01	4.7346E-01	1.128E+01	2.959E-02
4.479101E+01	4.53709E+01	1.1878E+00	1.0845E+01	4.3765E-01	9.422E+00	2.768E-02
4.788159E+01	4.54151E+01	1.0551E+00	9.0110E+00	4.0509E-01	7.837E+00	2.589E-02
5.118542E+01	4.54136E+01	9.3370E-01	7.4593E+00	3.7553E-01	6.491E+00	2.422E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
5.471721E+01	4.54044E+01	8.2632E-01	6.1754E+00	3.4872E-01	5.375E+00	2.266E-02
5.849270E+01	4.53903E+01	7.3135E-01	5.1129E+00	3.2442E-01	4.452E+00	2.120E-02
6.252870E+01	4.53732E+01	6.4735E-01	4.2335E+00	3.0241E-01	3.687E+00	1.983E-02
6.684318E+01	4.53543E+01	5.7299E-01	3.5054E+00	2.8249E-01	3.053E+00	1.855E-02
7.145536E+01	4.53345E+01	5.0717E-01	2.9024E+00	2.6447E-01	2.529E+00	1.735E-02
7.638578E+01	4.53146E+01	4.4872E-01	2.4022E+00	2.4815E-01	2.094E+00	1.623E-02
8.165640E+01	4.52951E+01	3.9644E-01	1.9853E+00	2.3339E-01	1.732E+00	1.518E-02
8.729069E+01	4.52749E+01	3.4922E-01	1.6360E+00	2.2002E-01	1.428E+00	1.420E-02
9.331374E+01	4.52549E+01	3.0765E-01	1.3482E+00	2.0789E-01	1.177E+00	1.329E-02
9.975239E+01	4.52356E+01	2.7104E-01	1.1111E+00	1.9689E-01	9.702E-01	1.243E-02
1.066353E+02	4.52171E+01	2.3849E-01	9.1456E-01	1.8689E-01	7.985E-01	1.163E-02
1.139931E+02	4.51994E+01	2.0982E-01	7.5268E-01	1.7779E-01	6.571E-01	1.088E-02
1.218587E+02	4.51827E+01	1.8461E-01	6.1949E-01	1.6948E-01	5.408E-01	1.017E-02
1.302669E+02	4.51670E+01	1.6243E-01	5.0989E-01	1.6188E-01	4.450E-01	9.518E-03
1.392553E+02	4.51524E+01	1.4293E-01	4.1971E-01	1.5490E-01	3.662E-01	8.903E-03
1.488640E+02	4.51388E+01	1.2577E-01	3.4549E-01	1.4848E-01	3.013E-01	8.329E-03
1.591356E+02	4.51262E+01	1.1068E-01	2.8441E-01	1.4255E-01	2.480E-01	7.791E-03
1.701159E+02	4.51146E+01	9.7405E-02	2.3414E-01	1.3705E-01	2.041E-01	7.288E-03
1.818539E+02	4.51039E+01	8.5725E-02	1.9276E-01	1.3194E-01	1.679E-01	6.818E-03
1.944018E+02	4.50942E+01	7.5450E-02	1.5871E-01	1.2715E-01	1.382E-01	6.378E-03
2.078156E+02	4.50852E+01	6.6408E-02	1.3067E-01	1.2267E-01	1.137E-01	5.966E-03
2.221548E+02	4.50771E+01	5.8453E-02	1.0759E-01	1.1844E-01	9.358E-02	5.581E-03
2.374835E+02	4.50696E+01	5.1453E-02	8.8596E-02	1.1444E-01	7.701E-02	5.221E-03
2.538699E+02	4.50628E+01	4.5293E-02	7.2955E-02	1.1065E-01	6.337E-02	4.884E-03
2.713869E+02	4.50566E+01	3.9872E-02	6.0078E-02	1.0703E-01	5.215E-02	4.569E-03
2.901126E+02	4.50510E+01	3.5101E-02	4.9476E-02	1.0356E-01	4.291E-02	4.274E-03
3.101304E+02	4.50460E+01	3.0902E-02	4.0746E-02	1.0024E-01	3.531E-02	3.998E-03
3.315294E+02	4.50414E+01	2.7206E-02	3.3557E-02	9.7044E-02	2.906E-02	3.740E-03
3.544049E+02	4.50372E+01	2.3953E-02	2.7638E-02	9.3958E-02	2.391E-02	3.498E-03
3.788588E+02	4.50334E+01	2.1090E-02	2.2764E-02	9.0972E-02	1.968E-02	3.273E-03
4.050001E+02	4.50300E+01	1.8570E-02	1.8750E-02	8.8078E-02	1.619E-02	3.061E-03
4.329451E+02	4.50270E+01	1.6351E-02	1.5444E-02	8.5267E-02	1.333E-02	2.864E-03

Z=45





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 341

pd Z = 46

Atomic weight = 1.064200E+02 g/mol, nominal density ρ (g/cm³) = 1.2000E+01

μ_0 (barns/atom) = μ (cm²/g) \times 1.76715E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.95417E+05

4 edges. Edge energies (keV):

K		2.43503E+00	L	I	3.60430E+00	L	II	3.33030E+00	L	III	3.17330E+00
M	I	6.69900E-00	M	II	5.59100E-00	M	III	5.31500E-00	M	IV	3.40000E-01
N	V	3.34700E-00	N	I	8.64000E-02	N	II	5.11000E-02	N	III	5.11000E-02
N	IV	5.44663E-03	N	V	5.01841E-03						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -4.3111E-01, -2.6820E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.0908E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
4.918045E-03	6.71496E+00	0.0000E+00	0.0000E+00	1.6607E-06	0.000E+00	2.521E+02
4.993321E-03	6.11262E+00	0.0000E+00	0.0000E+00	1.8159E-06	0.000E+00	2.483E+02
5.013395E-03	5.44009E+00	0.0000E+00	0.0000E+00	1.8592E-06	0.000E+00	2.473E+02
5.043505E-03	6.10578E+00	1.2926E+00	1.0134E+05	1.9257E-06	0.000E+00	2.458E+02
5.118781E-03	6.63715E+00	1.2527E+00	9.6767E+04	2.1000E-06	0.000E+00	2.422E+02
5.337699E-03	6.79644E+00	1.1464E+00	8.4925E+04	2.6787E-06	0.000E+00	2.323E+02
5.419399E-03	6.49543E+00	1.1101E+00	8.0997E+04	2.9243E-06	0.000E+00	2.288E+02
5.441185E-03	6.06873E+00	1.1007E+00	7.9991E+04	2.9926E-06	0.000E+00	2.279E+02
5.473865E-03	6.55164E+00	1.9521E+00	1.4102E+05	3.0976E-06	0.000E+00	2.265E+02
5.555655E-03	6.98189E+00	1.8837E+00	1.3407E+05	3.3725E-06	0.000E+00	2.232E+02
1.069000E-02	6.01744E+00	5.9028E+00	2.1834E+05	1.0846E-04	0.000E+00	1.160E+02
1.142761E-02	6.42158E+00	6.9580E+00	2.4076E+05	1.4982E-04	0.000E+00	1.085E+02
1.221612E-02	7.09077E+00	7.9974E+00	2.5886E+05	2.0579E-04	0.000E+00	1.015E+02
1.305903E-02	8.02678E+00	8.9357E+00	2.7057E+05	2.8113E-04	0.000E+00	9.494E+01
1.396010E-02	9.19899E+00	9.6879E+00	2.7441E+05	3.8193E-04	0.000E+00	8.881E+01
1.492335E-02	1.05437E+01	1.0183E+01	2.6981E+05	5.1605E-04	0.000E+00	8.308E+01
1.595306E-02	1.21215E+01	1.0377E+01	2.5720E+05	6.9350E-04	0.000E+00	7.772E+01
1.705382E-02	1.36564E+01	1.0260E+01	2.3789E+05	9.2659E-04	0.000E+00	7.270E+01
1.823053E-02	1.49854E+01	9.8569E+00	2.1379E+05	1.2324E-03	0.000E+00	6.801E+01
1.948844E-02	1.61464E+01	9.2189E+00	1.8705E+05	1.6297E-03	0.000E+00	6.362E+01
2.083314E-02	1.70936E+01	8.4134E+00	1.5969E+05	2.1437E-03	0.000E+00	5.951E+01
2.227063E-02	1.78069E+01	7.5120E+00	1.3338E+05	2.8051E-03	0.000E+00	5.567E+01
2.380730E-02	1.82908E+01	6.5829E+00	1.0934E+05	3.6515E-03	0.000E+00	5.208E+01
2.545001E-02	1.85688E+01	5.6822E+00	8.8284E+04	4.7285E-03	0.000E+00	4.872E+01
2.720606E-02	1.86751E+01	4.8484E+00	7.0467E+04	6.0918E-03	0.000E+00	4.557E+01
2.908327E-02	1.86465E+01	4.1035E+00	5.5791E+04	7.8080E-03	0.000E+00	4.263E+01
3.109002E-02	1.85158E+01	3.4558E+00	4.3953E+04	9.9568E-03	0.000E+00	3.988E+01
3.323523E-02	1.83091E+01	2.9046E+00	3.4557E+04	1.2633E-02	0.000E+00	3.731E+01
3.552846E-02	1.80435E+01	2.4427E+00	2.7186E+04	1.5948E-02	0.000E+00	3.490E+01
3.797993E-02	1.77246E+01	2.0602E+00	2.1449E+04	2.0033E-02	0.000E+00	3.264E+01
4.060054E-02	1.73419E+01	1.7461E+00	1.7005E+04	2.5040E-02	0.000E+00	3.054E+01
4.340198E-02	1.68525E+01	1.4895E+00	1.3570E+04	3.1145E-02	0.000E+00	2.857E+01
4.639671E-02	1.61137E+01	1.2807E+00	1.0915E+04	3.8549E-02	0.000E+00	2.672E+01
4.959809E-02	1.42976E+01	1.1109E+00	8.8566E+03	4.7482E-02	0.000E+00	2.500E+01
5.007800E-02	1.36230E+01	1.0892E+00	8.6002E+03	4.8912E-02	0.000E+00	2.476E+01
5.084450E-02	1.09636E+01	1.0562E+00	8.2141E+03	5.1247E-02	0.000E+00	2.438E+01
5.104890E-02	7.59590E+00	1.0478E+00	8.1158E+03	5.1879E-02	0.000E+00	2.429E+01
5.135550E-02	1.14201E+01	7.7492E+00	5.9666E+04	5.2837E-02	0.000E+00	2.414E+01
5.212200E-02	1.47671E+01	7.1742E+00	5.4426E+04	5.5272E-02	0.000E+00	2.379E+01
5.302035E-02	1.62824E+01	6.5676E+00	4.8980E+04	5.8204E-02	0.000E+00	2.338E+01
5.667876E-02	1.83065E+01	4.6854E+00	4.6854E+04	7.1007E-02	0.000E+00	2.187E+01
6.058959E-02	1.86618E+01	3.4892E+00	2.2771E+04	8.6215E-02	0.000E+00	2.046E+01
6.477028E-02	1.86221E+01	2.7454E+00	1.6760E+04	1.0419E-01	0.000E+00	1.914E+01
6.923942E-02	1.84661E+01	2.2608E+00	1.2911E+04	1.2532E-01	0.000E+00	1.791E+01
7.401695E-02	1.82750E+01	1.9334E+00	1.0329E+04	1.5004E-01	0.000E+00	1.675E+01
7.912411E-02	1.80705E+01	1.7064E+00	8.5276E+03	1.7880E-01	0.000E+00	1.567E+01
8.458368E-02	1.78268E+01	1.5464E+00	7.2291E+03	2.1211E-01	0.000E+00	1.466E+01
8.467200E-02	1.78216E+01	1.5443E+00	7.2118E+03	2.1267E-01	0.000E+00	1.464E+01
8.596800E-02	1.77138E+01	1.5151E+00	6.9687E+03	2.2096E-01	0.000E+00	1.442E+01
8.631360E-02	1.76255E+01	1.5077E+00	6.9071E+03	2.2319E-01	0.000E+00	1.436E+01
8.683200E-02	1.76845E+01	1.6484E+00	7.5064E+03	2.2656E-01	0.000E+00	1.428E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
8.812800E-02	1.77103E+01	1.6287E+00	7.3076E+03	2.3508E-01	0.000E+00	1.407E+01
9.041995E-02	1.76846E+01	1.5993E+00	6.9939E+03	2.5048E-01	0.000E+00	1.371E+01
9.665893E-02	1.75705E+01	1.5516E+00	6.3475E+03	2.9445E-01	0.000E+00	1.283E+01
1.033284E-01	1.74529E+01	1.5380E+00	5.8856E+03	3.4460E-01	0.000E+00	1.200E+01
1.104581E-01	1.73420E+01	1.5483E+00	5.5425E+03	4.0150E-01	0.000E+00	1.122E+01
1.180797E-01	1.72375E+01	1.5724E+00	5.2654E+03	4.6574E-01	0.000E+00	1.050E+01
1.262272E-01	1.71364E+01	1.6069E+00	5.0336E+03	5.3789E-01	0.000E+00	9.822E+00
1.349368E-01	1.70353E+01	1.6492E+00	4.8327E+03	6.1853E-01	0.000E+00	9.188E+00
1.442475E-01	1.69303E+01	1.6973E+00	4.6526E+03	7.0820E-01	0.000E+00	8.595E+00
1.547005E-01	1.68155E+01	1.7494E+00	4.4861E+03	8.0740E-01	0.000E+00	8.040E+00
1.648404E-01	1.66888E+01	1.8042E+00	4.3280E+03	9.1661E-01	0.000E+00	7.521E+00
1.762144E-01	1.65424E+01	1.8604E+00	4.1746E+03	1.0362E+00	0.000E+00	7.036E+00
1.883732E-01	1.63683E+01	1.9166E+00	4.0232E+03	1.1665E+00	0.000E+00	6.582E+00
2.013709E-01	1.61564E+01	1.9719E+00	3.8720E+03	1.3078E+00	0.000E+00	6.157E+00
2.152655E-01	1.58928E+01	2.0248E+00	3.7192E+03	1.4602E+00	0.000E+00	5.760E+00
2.301188E-01	1.55574E+01	2.0736E+00	3.5631E+03	1.6237E+00	0.000E+00	5.388E+00
2.459970E-01	1.51204E+01	2.1173E+00	3.4034E+03	1.7983E+00	0.000E+00	5.040E+00
2.629708E-01	1.45368E+01	2.1553E+00	3.2408E+03	1.9836E+00	0.000E+00	4.715E+00
2.811158E-01	1.37202E+01	2.1866E+00	3.0757E+03	2.1794E+00	0.000E+00	4.410E+00
3.005128E-01	1.24975E+01	2.2108E+00	2.9090E+03	2.3851E+00	0.000E+00	4.126E+00
3.212482E-01	1.03106E+01	2.2275E+00	2.7418E+03	2.6000E+00	0.000E+00	3.859E+00
3.280060E-01	9.03284E+00	2.2311E+00	2.6897E+03	2.6689E+00	0.000E+00	3.780E+00
3.332000E-01	7.08114E+00	2.2334E+00	2.6504E+03	2.7213E+00	0.000E+00	3.721E+00
3.343653E-01	5.69216E+00	2.2338E+00	2.6417E+03	2.7330E+00	0.000E+00	3.708E+00
3.363735E-01	6.38916E+00	4.6967E+00	5.5211E+03	2.7532E+00	0.000E+00	3.686E+00
3.383000E-01	6.32003E+00	4.7964E+00	5.6062E+03	2.7725E+00	0.000E+00	3.665E+00
3.396600E-01	5.52007E+00	4.8687E+00	5.6680E+03	2.7860E+00	0.000E+00	3.650E+00
3.417000E-01	6.37537E+00	6.7251E+00	7.7823E+03	2.8064E+00	0.000E+00	3.628E+00
3.434143E-01	6.72139E+00	6.8812E+00	7.9232E+03	2.8234E+00	0.000E+00	3.610E+00
3.468000E-01	6.99095E+00	7.2030E+00	8.2128E+03	2.8569E+00	0.000E+00	3.575E+00
3.671099E-01	6.90251E+00	9.5564E+00	1.0293E+04	3.0542E+00	0.000E+00	3.377E+00
3.924405E-01	7.18951E+00	1.3170E+01	1.3270E+04	3.2913E+00	0.000E+00	3.159E+00
4.195189E-01	8.67316E+00	1.6686E+01	1.5727E+04	3.5335E+00	0.000E+00	2.955E+00
4.484657E-01	1.10867E+01	1.9540E+01	1.7229E+04	3.7794E+00	0.000E+00	2.765E+00
4.794098E-01	1.39123E+01	2.1425E+01	1.7671E+04	4.0274E+00	0.000E+00	2.586E+00
5.124891E-01	1.62885E+01	2.2290E+01	1.7198E+04	4.2760E+00	0.000E+00	2.419E+00
5.208700E-01	1.64916E+01	2.2359E+01	1.6974E+04	4.3364E+00	0.000E+00	2.380E+00
5.288425E-01	1.58269E+01	2.2378E+01	1.6732E+04	4.3928E+00	0.000E+00	2.344E+00
5.309685E-01	1.44342E+01	2.2376E+01	1.6664E+04	4.4077E+00	0.000E+00	2.335E+00
5.341575E-01	1.62489E+01	2.5425E+01	1.8821E+04	4.4299E+00	0.000E+00	2.321E+00
5.421300E-01	1.81690E+01	2.5386E+01	1.8516E+04	4.4847E+00	0.000E+00	2.287E+00
5.478508E-01	1.89247E+01	2.5337E+01	1.8287E+04	4.5235E+00	0.000E+00	2.263E+00
5.479180E-01	1.89321E+01	2.5336E+01	1.8284E+04	4.5240E+00	0.000E+00	2.263E+00
5.563045E-01	1.94716E+01	2.5236E+01	1.7938E+04	4.5800E+00	0.000E+00	2.229E+00
5.585409E-01	1.90688E+01	2.5204E+01	1.7843E+04	4.5948E+00	0.000E+00	2.220E+00
5.618955E-01	2.01262E+01	2.6465E+01	1.8624E+04	4.6168E+00	0.000E+00	2.207E+00
5.702820E-01	2.16034E+01	2.6325E+01	1.8253E+04	4.6711E+00	0.000E+00	2.174E+00
5.856525E-01	2.34214E+01	2.6101E+01	1.7561E+04	4.7682E+00	0.000E+00	2.117E+00
6.260625E-01	2.68121E+01	2.4928E+01	1.5745E+04	5.0082E+00	0.000E+00	1.980E+00
6.565020E-01	2.84827E+01	2.3978E+01	1.4442E+04	5.1751E+00	0.000E+00	1.889E+00
6.665505E-01	2.86202E+01	2.3654E+01	1.4032E+04	5.2277E+00	0.000E+00	1.860E+00
6.692609E-01	2.82322E+01	2.3566E+01	1.3923E+04	5.2417E+00	0.000E+00	1.853E+00
6.732495E-01	2.89922E+01	2.4461E+01	1.4367E+04	5.2622E+00	0.000E+00	1.842E+00
6.832980E-01	2.99729E+01	2.4134E+01	1.3966E+04	5.3128E+00	0.000E+00	1.814E+00
7.154399E-01	3.18543E+01	2.3094E+01	1.2764E+04	5.4670E+00	0.000E+00	1.733E+00
7.648052E-01	3.38810E+01	2.1563E+01	1.1148E+04	5.6823E+00	0.000E+00	1.621E+00
8.175768E-01	3.54626E+01	2.0056E+01	9.7002E+03	5.8858E+00	0.000E+00	1.516E+00
8.159896E-01	3.61537E+01	1.8617E+01	8.4227E+03	6.0760E+00	0.000E+00	1.419E+00
9.342948E-01	3.77973E+01	1.7250E+01	7.3007E+03	6.2513E+00	0.000E+00	1.327E+00
9.987612E-01	3.87285E+01	1.5952E+01	6.3155E+03	6.4103E+00	0.000E+00	1.241E+00
1.067676E+00	3.94074E+01	1.4612E+01	5.4118E+03	6.5517E+00	0.000E+00	1.161E+00
1.141345E+00	3.98884E+01	1.3372E+01	4.6327E+03	6.6746E+00	0.000E+00	1.086E+00
1.220098E+00	4.02408E+01	1.2224E+01	3.9617E+03	6.7778E+00	0.000E+00	1.016E+00
1.304285E+00	4.04949E+01	1.1173E+01	3.3873E+03	6.8608E+00	0.000E+00	9.506E-01
1.394281E+00	4.06675E+01	1.0160E+01	2.8815E+03	6.9229E+00	0.000E+00	8.892E-01

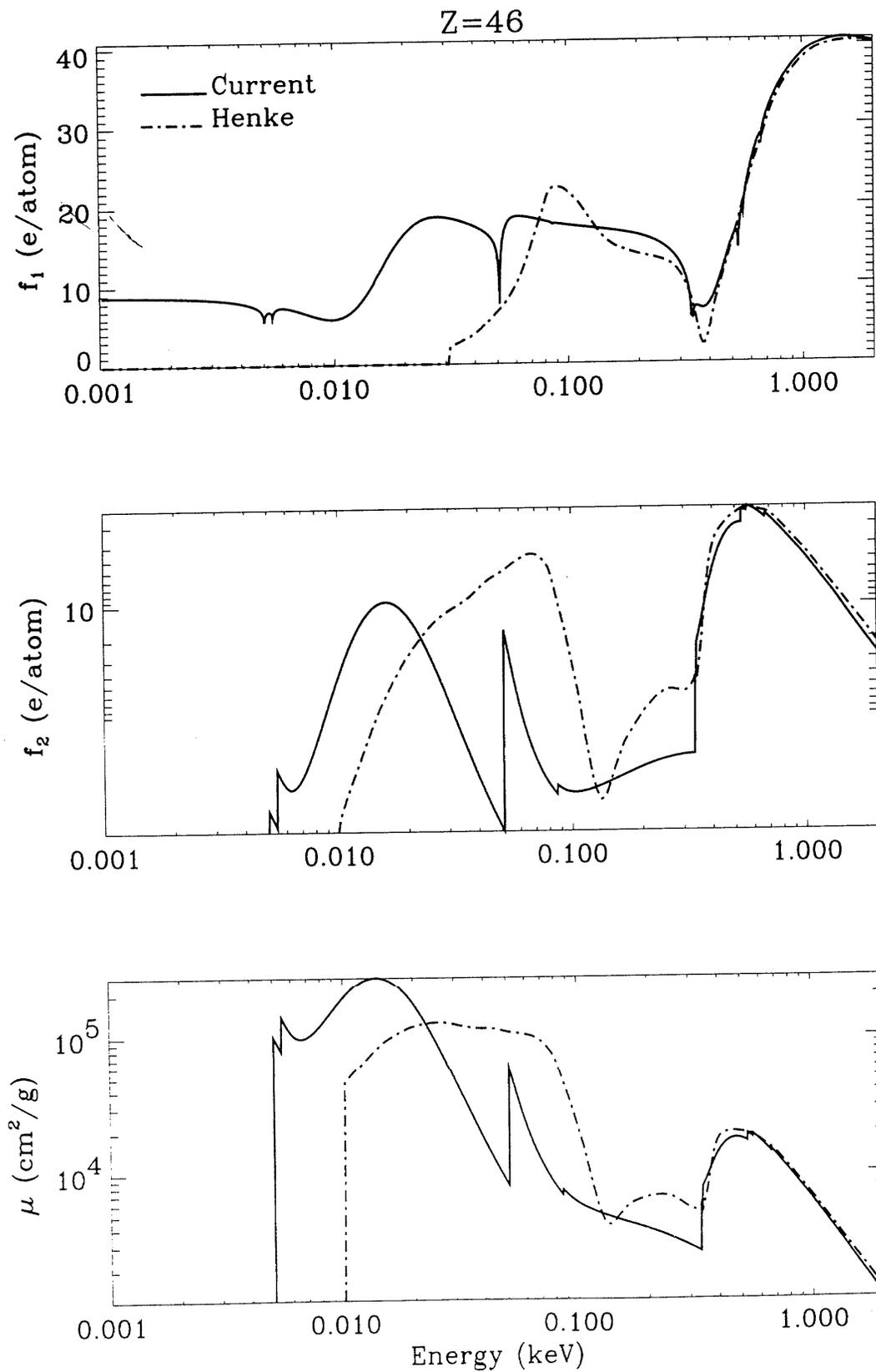
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 343

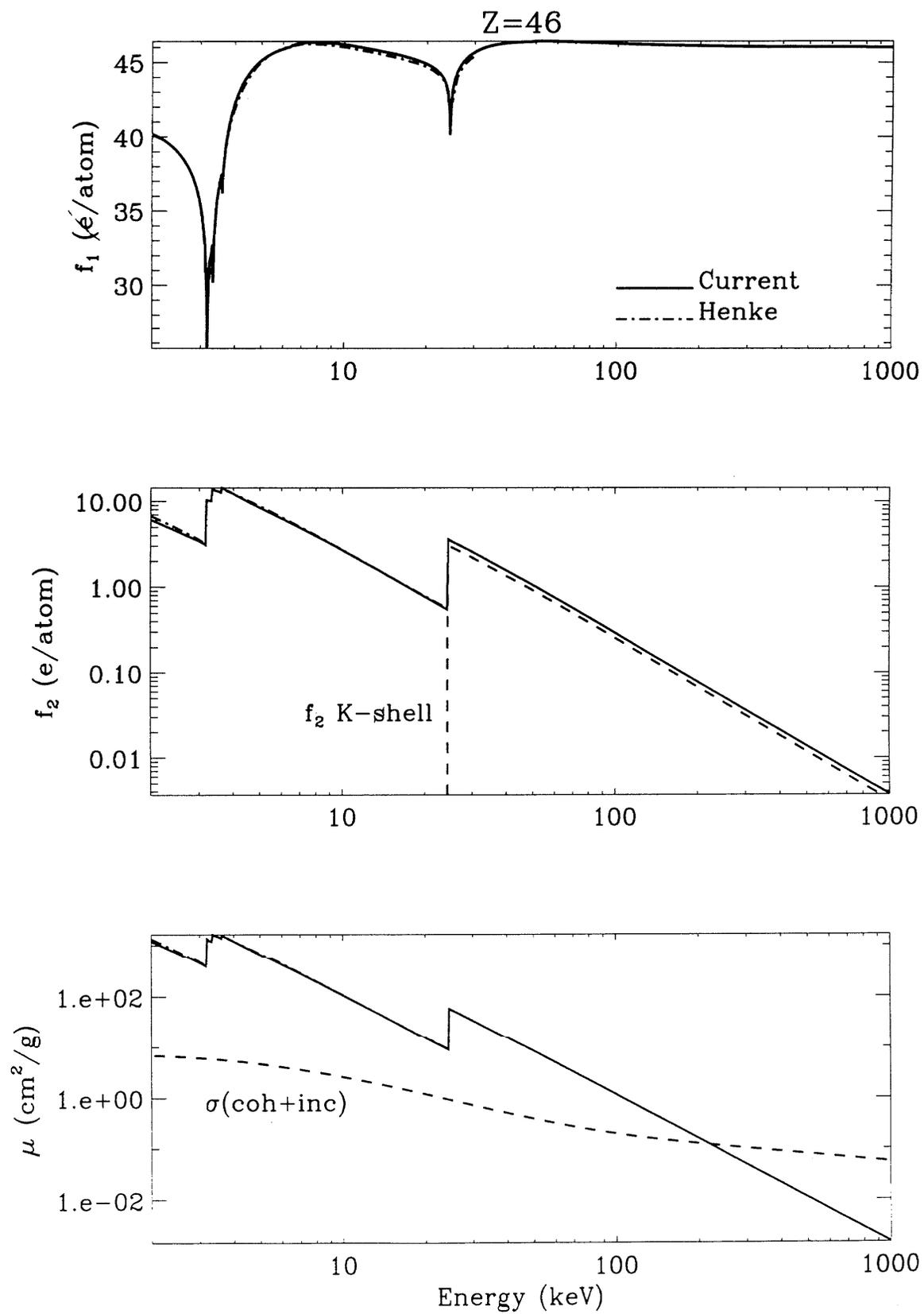
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.490486E+00	4.07247E+01	9.2068E+00	2.4425E+03	6.9639E+00	0.000E+00	8.318E-01
1.593329E+00	4.06964E+01	8.3565E+00	2.0738E+03	6.9835E+00	0.000E+00	7.781E-01
1.703269E+00	4.06170E+01	7.5968E+00	1.7636E+03	6.9820E+00	0.000E+00	7.279E-01
1.820795E+00	4.04717E+01	6.9175E+00	1.5023E+03	6.9594E+00	0.000E+00	6.809E-01
1.946430E+00	4.02765E+01	6.3097E+00	1.2818E+03	6.9163E+00	0.000E+00	6.370E-01
2.080733E+00	4.00306E+01	5.7651E+00	1.0956E+03	6.8533E+00	0.000E+00	5.959E-01
2.224304E+00	3.97193E+01	5.2551E+00	9.3421E+02	6.7712E+00	0.000E+00	5.574E-01
2.377781E+00	3.92989E+01	4.7721E+00	7.9358E+02	6.6710E+00	0.000E+00	5.214E-01
2.541848E+00	3.87190E+01	4.3369E+00	6.7467E+02	6.5537E+00	0.000E+00	4.878E-01
2.717235E+00	3.78775E+01	3.9451E+00	5.7410E+02	6.4205E+00	0.000E+00	4.563E-01
2.904724E+00	3.64793E+01	3.5896E+00	4.8865E+02	6.2727E+00	0.000E+00	4.268E-01
3.105150E+00	3.29123E+01	3.2270E+00	4.1093E+02	6.1116E+00	0.000E+00	3.993E-01
3.109834E+00	3.27326E+01	3.2184E+00	4.0922E+02	6.1078E+00	0.000E+00	3.987E-01
3.157434E+00	2.93641E+01	3.1330E+00	3.9236E+02	6.0694E+00	0.000E+00	3.927E-01
3.170127E+00	2.56358E+01	3.1109E+00	3.8803E+02	6.0592E+00	0.000E+00	3.911E-01
3.189167E+00	2.90306E+01	1.0218E+01	1.2669E+03	6.0438E+00	0.000E+00	3.888E-01
3.236766E+00	3.17693E+01	1.0188E+01	1.2446E+03	6.0054E+00	0.000E+00	3.830E-01
3.263694E+00	3.22340E+01	1.0172E+01	1.2324E+03	5.9837E+00	0.000E+00	3.799E-01
3.313649E+00	3.17769E+01	1.0145E+01	1.2105E+03	5.9434E+00	0.000E+00	3.742E-01
3.319406E+00	3.14036E+01	1.0142E+01	1.2081E+03	5.9388E+00	0.000E+00	3.735E-01
3.326970E+00	3.01956E+01	1.0138E+01	1.2049E+03	5.9327E+00	0.000E+00	3.727E-01
3.346952E+00	3.23154E+01	1.3662E+01	1.6141E+03	5.9167E+00	0.000E+00	3.704E-01
3.396906E+00	3.45954E+01	1.3509E+01	1.5725E+03	5.8766E+00	0.000E+00	3.650E-01
3.532214E+00	3.69631E+01	1.2986E+01	1.4538E+03	5.7686E+00	0.000E+00	3.510E-01
3.548445E+00	3.70718E+01	1.2905E+01	1.4381E+03	5.7557E+00	0.000E+00	3.494E-01
3.586279E+00	3.69573E+01	1.2710E+01	1.4014E+03	5.7257E+00	0.000E+00	3.457E-01
3.600696E+00	3.62000E+01	1.2634E+01	1.3875E+03	5.7143E+00	0.000E+00	3.443E-01
3.622322E+00	3.74090E+01	1.4377E+01	1.5694E+03	5.6973E+00	0.000E+00	3.423E-01
3.676386E+00	3.88586E+01	1.4066E+01	1.5129E+03	5.6548E+00	0.000E+00	3.372E-01
3.793288E+00	4.05122E+01	1.3384E+01	1.3952E+03	5.5637E+00	0.000E+00	3.269E-01
4.055024E+00	4.25804E+01	1.1932E+01	1.1635E+03	5.3644E+00	0.000E+00	3.058E-01
4.334821E+00	4.37716E+01	1.0633E+01	9.6995E+02	5.1592E+00	0.000E+00	2.860E-01
4.633924E+00	4.45459E+01	9.5222E+00	8.1254E+02	4.9496E+00	0.000E+00	2.676E-01
4.953664E+00	4.50808E+01	8.5451E+00	6.8210E+02	4.7370E+00	0.000E+00	2.503E-01
5.295467E+00	4.54549E+01	7.6856E+00	5.7389E+02	4.5228E+00	0.000E+00	2.341E-01
5.660855E+00	4.57234E+01	6.9230E+00	4.8358E+02	4.3081E+00	0.000E+00	2.190E-01
6.051453E+00	4.59179E+01	6.2398E+00	4.0773E+02	4.0941E+00	0.000E+00	2.049E-01
6.469004E+00	4.61414E+01	5.6154E+00	3.4324E+02	3.8821E+00	0.000E+00	1.917E-01
6.915365E+00	4.62653E+01	5.0297E+00	2.8760E+02	3.6730E+00	0.000E+00	1.793E-01
7.392525E+00	4.63334E+01	4.5015E+00	2.4078E+02	3.4677E+00	0.000E+00	1.677E-01
7.902609E+00	4.63307E+01	4.0278E+00	2.0154E+02	3.2671E+00	0.000E+00	1.569E-01
8.447890E+00	4.63063E+01	3.6074E+00	1.6885E+02	3.0718E+00	0.000E+00	1.468E-01
9.030794E+00	4.62851E+01	3.2259E+00	1.4125E+02	2.8825E+00	0.000E+00	1.373E-01
9.653919E+00	4.62264E+01	2.8623E+00	1.1724E+02	2.6997E+00	0.000E+00	1.284E-01
1.032004E+01	4.61473E+01	2.5411E+00	9.7364E+01	2.5239E+00	0.000E+00	1.201E-01
1.103212E+01	4.60568E+01	2.2566E+00	8.0880E+01	2.3553E+00	0.000E+00	1.124E-01
1.179334E+01	4.59590E+01	2.0056E+00	6.7247E+01	2.1943E+00	0.000E+00	1.051E-01
1.260708E+01	4.58564E+01	1.7844E+00	5.5966E+01	2.0410E+00	0.000E+00	9.834E-02
1.347697E+01	4.57502E+01	1.5881E+00	4.6594E+01	1.8954E+00	0.000E+00	9.200E-02
1.440688E+01	4.56397E+01	1.4114E+00	3.8737E+01	1.7577E+00	0.000E+00	8.606E-02
1.540095E+01	4.55209E+01	1.2523E+00	3.2152E+01	1.6279E+00	0.000E+00	8.050E-02
1.646362E+01	4.53904E+01	1.1080E+00	2.6611E+01	1.5057E+00	0.000E+00	7.531E-02
1.759961E+01	4.52410E+01	9.8014E-01	2.2021E+01	1.3911E+00	0.000E+00	7.045E-02
1.881398E+01	4.50641E+01	8.6786E-01	1.8240E+01	1.2839E+00	0.000E+00	6.590E-02
2.011215E+01	4.48392E+01	7.6913E-01	1.5122E+01	1.1840E+00	0.000E+00	6.165E-02
2.149988E+01	4.45155E+01	6.8225E-01	1.2548E+01	1.0909E+00	0.000E+00	5.767E-02
2.298338E+01	4.39078E+01	6.0572E-01	1.0421E+01	1.0046E+00	0.000E+00	5.395E-02
2.386329E+01	4.30041E+01	5.6667E-01	9.3898E+00	9.5878E-01	0.000E+00	5.196E-02
2.422855E+01	4.17152E+01	5.5164E-01	9.0030E+00	9.4083E-01	0.000E+00	5.117E-02
2.432595E+01	4.01649E+01	5.4775E-01	8.9036E+00	9.3614E-01	0.000E+00	5.097E-02
2.447205E+01	4.17399E+01	3.5968E+00	5.8117E+01	9.2919E-01	4.936E+01	5.066E-02
2.456923E+01	4.23366E+01	3.5720E+00	5.7488E+01	9.2461E-01	4.883E+01	5.046E-02
2.483731E+01	4.31644E+01	3.5051E+00	5.5802E+01	9.1219E-01	4.740E+01	4.992E-02
2.626450E+01	4.46043E+01	3.1939E+00	4.8085E+01	8.5073E-01	4.088E+01	4.721E-02
2.807676E+01	4.52922E+01	2.8664E+00	4.0368E+01	7.8263E-01	3.444E+01	4.416E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
3.001405E+01	4.56821E+01	2.5645E+00	3.3786E+01	7.1999E-01	2.892E+01	4.131E-02
3.208502E+01	4.59330E+01	2.2894E+00	2.8215E+01	6.6249E-01	2.422E+01	3.864E-02
3.429889E+01	4.60979E+01	2.0390E+00	2.3507E+01	6.0981E-01	2.022E+01	3.615E-02
3.666551E+01	4.62076E+01	1.8163E+00	1.9587E+01	5.6163E-01	1.689E+01	3.381E-02
3.919543E+01	4.62804E+01	1.6181E+00	1.6324E+01	5.1765E-01	1.410E+01	3.163E-02
4.189992E+01	4.63277E+01	1.4416E+00	1.3605E+01	4.7756E-01	1.177E+01	2.959E-02
4.479101E+01	4.63569E+01	1.2846E+00	1.1340E+01	4.4108E-01	9.830E+00	2.768E-02
4.788159E+01	4.63737E+01	1.1447E+00	9.4536E+00	4.0792E-01	8.208E+00	2.589E-02
5.118542E+01	4.64139E+01	1.0151E+00	7.8418E+00	3.7783E-01	6.814E+00	2.422E-02
5.471721E+01	4.64097E+01	8.9866E-01	6.4942E+00	3.5054E-01	5.645E+00	2.266E-02
5.849270E+01	4.63988E+01	7.9565E-01	5.3787E+00	3.2581E-01	4.677E+00	2.120E-02
6.252870E+01	4.63839E+01	7.0451E-01	4.4551E+00	3.0343E-01	3.875E+00	1.983E-02
6.684318E+01	4.63663E+01	6.2385E-01	3.6905E+00	2.8317E-01	3.210E+00	1.855E-02
7.145536E+01	4.63473E+01	5.5241E-01	3.0569E+00	2.6485E-01	2.660E+00	1.735E-02
7.638578E+01	4.63277E+01	4.8916E-01	2.5322E+00	2.4828E-01	2.204E+00	1.623E-02
8.165640E+01	4.63082E+01	4.3235E-01	2.0936E+00	2.3328E-01	1.823E+00	1.518E-02
8.729069E+01	4.62880E+01	3.8101E-01	1.7259E+00	2.1970E-01	1.504E+00	1.420E-02
9.331374E+01	4.62677E+01	3.3579E-01	1.4229E+00	2.0740E-01	1.240E+00	1.329E-02
9.975239E+01	4.62479E+01	2.9595E-01	1.1731E+00	1.9624E-01	1.023E+00	1.243E-02
1.066353E+02	4.62288E+01	2.6080E-01	9.6708E-01	1.8610E-01	8.431E-01	1.163E-02
1.139931E+02	4.62106E+01	2.2958E-01	7.9636E-01	1.7687E-01	6.942E-01	1.088E-02
1.218587E+02	4.61933E+01	2.0211E-01	6.5582E-01	1.6846E-01	5.717E-01	1.017E-02
1.302669E+02	4.61770E+01	1.7794E-01	5.4011E-01	1.6077E-01	4.707E-01	9.518E-03
1.392553E+02	4.61617E+01	1.5666E-01	4.4484E-01	1.5371E-01	3.876E-01	8.903E-03
1.488640E+02	4.61475E+01	1.3794E-01	3.6640E-01	1.4723E-01	3.192E-01	8.329E-03
1.591356E+02	4.61343E+01	1.2146E-01	3.0180E-01	1.4124E-01	2.628E-01	7.791E-03
1.701159E+02	4.61221E+01	1.0695E-01	2.4860E-01	1.3570E-01	2.164E-01	7.288E-03
1.818539E+02	4.61109E+01	9.4185E-02	2.0479E-01	1.3055E-01	1.782E-01	6.818E-03
1.944018E+02	4.61005E+01	8.2944E-02	1.6871E-01	1.2574E-01	1.467E-01	6.378E-03
2.078156E+02	4.60911E+01	7.3048E-02	1.3899E-01	1.2124E-01	1.208E-01	5.966E-03
2.221548E+02	4.60824E+01	6.4336E-02	1.1451E-01	1.1700E-01	9.949E-02	5.581E-03
2.374835E+02	4.60745E+01	5.6665E-02	9.4349E-02	1.1300E-01	8.193E-02	5.221E-03
2.538699E+02	4.60673E+01	4.9911E-02	7.7739E-02	1.0921E-01	6.746E-02	4.884E-03
2.713869E+02	4.60607E+01	4.3964E-02	6.4056E-02	1.0560E-01	5.555E-02	4.569E-03
2.901126E+02	4.60548E+01	3.8726E-02	5.2783E-02	1.0216E-01	4.574E-02	4.274E-03
3.101304E+02	4.60494E+01	3.4114E-02	4.3496E-02	9.8861E-02	3.766E-02	3.998E-03
3.315294E+02	4.60445E+01	3.0053E-02	3.5844E-02	9.5692E-02	3.101E-02	3.740E-03
3.544049E+02	4.60400E+01	2.6475E-02	2.9539E-02	9.2639E-02	2.554E-02	3.498E-03
3.788588E+02	4.60360E+01	2.3325E-02	2.4344E-02	8.9691E-02	2.103E-02	3.273E-03
4.050001E+02	4.60323E+01	2.0550E-02	2.0064E-02	8.6839E-02	1.732E-02	3.061E-03
4.329451E+02	4.60291E+01	1.8106E-02	1.6536E-02	8.4074E-02	1.426E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 347

Ag Z = 47

Atomic weight = 1.078682E+02 g/mol, nominal density ρ (g/cm³) = 1.0480E+01

μ_0 (barns/atom) = μ (cm²/g) \times 1.79119E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.90109E+05

Edges. Edge energies (keV):

K		2.55140E+00	L	I	3.80580E+00	L	II	3.52370E+00	L	III	3.35110E+00
M	I	7.17500E-00	M	II	6.02400E-00	M	III	5.71400E-00	M	IV	3.72800E-01
N	V	3.66700E-00	N	I	9.52000E-02	N	II	6.26000E-02	N	III	5.59000E-02
O	IV	3.30000E-03	O	V	3.30000E-03						

Relativistic correction estimate f_{rel} (HR2,3/5CL) = -4.5490E-01, -2.8260E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.1234E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	2.84090E+00	4.5969E+00	1.6775E+05	9.4438E-05	0.000E+00	1.160E+02
1.142761E-02	3.04646E+00	4.9050E+00	1.6744E+05	1.3097E-04	0.000E+00	1.085E+02
1.221612E-02	3.28198E+00	5.2143E+00	1.6651E+05	1.8063E-04	0.000E+00	1.015E+02
1.305903E-02	3.54889E+00	5.5216E+00	1.6495E+05	2.4771E-04	0.000E+00	9.494E+01
1.396010E-02	3.84865E+00	5.8214E+00	1.6268E+05	3.3783E-04	0.000E+00	8.881E+01
1.492335E-02	4.17867E+00	6.1064E+00	1.5963E+05	4.5820E-04	0.000E+00	8.308E+01
1.595306E-02	4.53536E+00	6.3737E+00	1.5586E+05	6.1805E-04	0.000E+00	7.772E+01
1.705382E-02	4.91531E+00	6.6206E+00	1.5145E+05	8.2913E-04	0.000E+00	7.270E+01
1.823053E-02	5.31506E+00	6.8451E+00	1.4647E+05	1.1063E-03	0.000E+00	6.801E+01
1.948844E-02	5.73104E+00	7.0457E+00	1.4104E+05	1.4682E-03	0.000E+00	6.362E+01
2.083314E-02	6.15960E+00	7.2214E+00	1.3522E+05	1.9381E-03	0.000E+00	5.951E+01
2.227063E-02	6.59705E+00	7.3718E+00	1.2913E+05	2.5447E-03	0.000E+00	5.567E+01
2.380730E-02	7.03979E+00	7.4968E+00	1.2284E+05	3.3237E-03	0.000E+00	5.208E+01
2.545001E-02	7.48426E+00	7.5970E+00	1.1645E+05	4.3185E-03	0.000E+00	4.872E+01
2.720606E-02	7.92702E+00	7.6732E+00	1.1003E+05	5.5817E-03	0.000E+00	4.557E+01
2.908327E-02	8.36475E+00	7.7266E+00	1.0364E+05	7.1772E-03	0.000E+00	4.263E+01
3.109002E-02	8.79411E+00	7.7586E+00	9.7352E+04	9.1814E-03	0.000E+00	3.988E+01
3.323523E-02	9.21172E+00	7.7709E+00	9.1213E+04	1.1685E-02	0.000E+00	3.731E+01
3.552846E-02	9.61381E+00	7.7652E+00	8.5263E+04	1.4797E-02	0.000E+00	3.490E+01
3.797993E-02	9.99579E+00	7.7435E+00	7.9537E+04	1.8643E-02	0.000E+00	3.264E+01
4.060054E-02	1.03512E+01	7.7077E+00	7.4059E+04	2.3371E-02	0.000E+00	3.054E+01
4.340198E-02	1.06696E+01	7.6596E+00	6.8847E+04	2.9153E-02	0.000E+00	2.857E+01
4.639671E-02	1.09302E+01	7.6011E+00	6.3911E+04	3.6186E-02	0.000E+00	2.672E+01
4.959809E-02	1.10819E+01	7.5340E+00	5.9258E+04	4.4697E-02	0.000E+00	2.500E+01
5.302035E-02	1.09250E+01	7.4599E+00	5.4888E+04	5.4940E-02	0.000E+00	2.338E+01
5.478200E-02	1.03446E+01	7.4215E+00	5.2849E+04	6.0676E-02	0.000E+00	2.263E+01
5.562050E-02	9.15723E+00	7.4033E+00	5.1925E+04	6.3517E-02	0.000E+00	2.229E+01
5.584410E-02	7.57811E+00	7.3984E+00	5.1683E+04	6.4287E-02	0.000E+00	2.220E+01
5.617950E-02	9.41576E+00	1.0577E+01	7.3446E+04	6.5451E-02	0.000E+00	2.207E+01
5.667876E-02	1.06211E+01	1.0414E+01	7.1677E+04	6.7205E-02	0.000E+00	2.187E+01
5.701800E-02	1.10650E+01	1.0308E+01	7.0527E+04	6.8411E-02	0.000E+00	2.174E+01
6.058959E-02	1.26538E+01	9.3944E+00	6.0486E+04	8.1814E-02	0.000E+00	2.046E+01
6.134800E-02	1.26611E+01	9.2390E+00	5.8750E+04	8.4825E-02	0.000E+00	2.021E+01
6.228700E-02	1.22300E+01	9.0530E+00	5.6700E+04	8.8633E-02	0.000E+00	1.991E+01
6.253740E-02	1.14631E+01	9.0013E+00	5.6150E+04	8.9664E-02	0.000E+00	1.983E+01
6.291300E-02	1.24638E+01	1.0557E+01	6.5461E+04	9.1221E-02	0.000E+00	1.971E+01
6.385200E-02	1.34374E+01	1.0250E+01	6.2625E+04	9.5175E-02	0.000E+00	1.942E+01
6.477028E-02	1.38959E+01	9.9783E+00	6.0099E+04	9.9126E-02	0.000E+00	1.914E+01
6.923942E-02	1.49135E+01	8.9470E+00	5.0409E+04	1.1953E-01	0.000E+00	1.791E+01
7.401695E-02	1.53648E+01	8.2211E+00	4.3330E+04	1.4347E-01	0.000E+00	1.675E+01
7.912411E-02	1.56512E+01	7.6870E+00	3.7899E+04	1.7139E-01	0.000E+00	1.567E+01
8.458368E-02	1.58628E+01	7.2641E+00	3.3503E+04	2.0380E-01	0.000E+00	1.466E+01
9.041995E-02	1.60128E+01	6.9106E+00	2.9815E+04	2.4123E-01	0.000E+00	1.371E+01
9.329600E-02	1.60390E+01	6.7617E+00	2.8273E+04	2.6068E-01	0.000E+00	1.329E+01
9.472400E-02	1.59917E+01	6.6926E+00	2.7562E+04	2.7058E-01	0.000E+00	1.309E+01
9.510480E-02	1.59036E+01	6.6746E+00	2.7378E+04	2.7325E-01	0.000E+00	1.304E+01
9.567600E-02	1.60128E+01	6.8386E+00	2.7884E+04	2.7726E-01	0.000E+00	1.296E+01
9.665893E-02	1.61030E+01	6.7975E+00	2.7434E+04	2.8424E-01	0.000E+00	1.283E+01
9.710400E-02	1.61295E+01	6.7793E+00	2.7235E+04	2.8742E-01	0.000E+00	1.277E+01
1.033284E-01	1.63562E+01	6.5480E+00	2.4722E+04	3.3340E-01	0.000E+00	1.200E+01
1.104581E-01	1.65356E+01	6.3253E+00	2.2339E+04	3.8930E-01	0.000E+00	1.122E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.180797E-01	1.66898E+01	6.1216E+00	2.0224E+04	4.5256E-01	0.000E+00	1.050E+01
1.262272E-01	1.68238E+01	5.9328E+00	1.8336E+04	5.2378E-01	0.000E+00	9.822E+00
1.349368E-01	1.69382E+01	5.7564E+00	1.6642E+04	6.0355E-01	0.000E+00	9.188E+00
1.442475E-01	1.70318E+01	5.5901E+00	1.5118E+04	6.9245E-01	0.000E+00	8.595E+00
1.542005E-01	1.71026E+01	5.4324E+00	1.3743E+04	7.9101E-01	0.000E+00	8.040E+00
1.648404E-01	1.71474E+01	5.2817E+00	1.2500E+04	8.9973E-01	0.000E+00	7.521E+00
1.762144E-01	1.71640E+01	5.1370E+00	1.1372E+04	1.0191E+00	0.000E+00	7.036E+00
1.883732E-01	1.71454E+01	4.9970E+00	1.0348E+04	1.1494E+00	0.000E+00	6.582E+00
2.013709E-01	1.70808E+01	4.8607E+00	9.4165E+03	1.2909E+00	0.000E+00	6.157E+00
2.152655E-01	1.69624E+01	4.7272E+00	8.5668E+03	1.4439E+00	0.000E+00	5.760E+00
2.301188E-01	1.67760E+01	4.5956E+00	7.7907E+03	1.6083E+00	0.000E+00	5.388E+00
2.459970E-01	1.65012E+01	4.4645E+00	7.0799E+03	1.7842E+00	0.000E+00	5.040E+00
2.629708E-01	1.61067E+01	4.3331E+00	6.4280E+03	1.9713E+00	0.000E+00	4.715E+00
2.811158E-01	1.55436E+01	4.2008E+00	5.8295E+03	2.1694E+00	0.000E+00	4.410E+00
3.005128E-01	1.47270E+01	4.0673E+00	5.2800E+03	2.3778E+00	0.000E+00	4.126E+00
3.212482E-01	1.34807E+01	3.9327E+00	4.7757E+03	2.5961E+00	0.000E+00	3.859E+00
3.434143E-01	1.13239E+01	3.7970E+00	4.3133E+03	2.8233E+00	0.000E+00	3.610E+00
3.593660E-01	8.17693E+00	3.7041E+00	4.0210E+03	2.9825E+00	0.000E+00	3.450E+00
3.648665E-01	5.38571E+00	3.6730E+00	3.9271E+03	3.0366E+00	0.000E+00	3.398E+00
3.653440E-01	4.87928E+00	3.6703E+00	3.9191E+03	3.0412E+00	0.000E+00	3.394E+00
3.663333E-01	2.90880E+00	3.6648E+00	3.9026E+03	3.0509E+00	0.000E+00	3.384E+00
3.671099E-01	2.81916E+00	7.8010E+00	8.2897E+03	3.0585E+00	0.000E+00	3.377E+00
3.685335E-01	4.33783E+00	7.8731E+00	8.3340E+03	3.0723E+00	0.000E+00	3.364E+00
3.709360E-01	4.39445E+00	7.9977E+00	8.4110E+03	3.0957E+00	0.000E+00	3.342E+00
3.724272E-01	3.12064E+00	8.0768E+00	8.4603E+03	3.1101E+00	0.000E+00	3.329E+00
3.740340E-01	4.35482E+00	1.1122E+01	1.1600E+04	3.1256E+00	0.000E+00	3.315E+00
3.746640E-01	4.77825E+00	1.1180E+01	1.1641E+04	3.1317E+00	0.000E+00	3.309E+00
3.802560E-01	6.26493E+00	1.1714E+01	1.2017E+04	3.1854E+00	0.000E+00	3.261E+00
3.924405E-01	7.23412E+00	1.2994E+01	1.2917E+04	3.3006E+00	0.000E+00	3.159E+00
4.195189E-01	8.52533E+00	1.6302E+01	1.5159E+04	3.5485E+00	0.000E+00	2.955E+00
4.484657E-01	1.06783E+01	1.9390E+01	1.6867E+04	3.8003E+00	0.000E+00	2.765E+00
4.794098E-01	1.34741E+01	2.1687E+01	1.7647E+04	4.0550E+00	0.000E+00	2.586E+00
5.124891E-01	1.64378E+01	2.3018E+01	1.7521E+04	4.3107E+00	0.000E+00	2.419E+00
5.478508E-01	1.88361E+01	2.3418E+01	1.6675E+04	4.5659E+00	0.000E+00	2.263E+00
5.599720E-01	1.91053E+01	2.3372E+01	1.6282E+04	4.6491E+00	0.000E+00	2.214E+00
5.685430E-01	1.83518E+01	2.3295E+01	1.5984E+04	4.7067E+00	0.000E+00	2.181E+00
5.708286E-01	1.68858E+01	2.3269E+01	1.5902E+04	4.7218E+00	0.000E+00	2.172E+00
5.742570E-01	1.87523E+01	2.6407E+01	1.7939E+04	4.7445E+00	0.000E+00	2.159E+00
5.828280E-01	2.06937E+01	2.6281E+01	1.7591E+04	4.8003E+00	0.000E+00	2.127E+00
5.856525E-01	2.10721E+01	2.6233E+01	1.7474E+04	4.8185E+00	0.000E+00	2.117E+00
5.903520E-01	2.15803E+01	2.6149E+01	1.7279E+04	4.8485E+00	0.000E+00	2.100E+00
5.993880E-01	2.20441E+01	2.5967E+01	1.6901E+04	4.9054E+00	0.000E+00	2.069E+00
6.017976E-01	2.16033E+01	2.5915E+01	1.6799E+04	4.9204E+00	0.000E+00	2.060E+00
6.054120E-01	2.26665E+01	2.7194E+01	1.7523E+04	4.9427E+00	0.000E+00	2.048E+00
6.144480E-01	2.41171E+01	2.6984E+01	1.7132E+04	4.9977E+00	0.000E+00	2.018E+00
6.260625E-01	2.53913E+01	2.6689E+01	1.6630E+04	5.0669E+00	0.000E+00	1.980E+00
6.692609E-01	2.87197E+01	2.5430E+01	1.4823E+04	5.3091E+00	0.000E+00	1.853E+00
7.031500E-01	3.03701E+01	2.4352E+01	1.3510E+04	5.4834E+00	0.000E+00	1.763E+00
7.139125E-01	3.04724E+01	2.4005E+01	1.3117E+04	5.5360E+00	0.000E+00	1.737E+00
7.154399E-01	3.03653E+01	2.3955E+01	1.3062E+04	5.5434E+00	0.000E+00	1.733E+00
7.167825E-01	3.00829E+01	2.3912E+01	1.3014E+04	5.5498E+00	0.000E+00	1.730E+00
7.210875E-01	3.08260E+01	2.4813E+01	1.3424E+04	5.5703E+00	0.000E+00	1.719E+00
7.318500E-01	3.17868E+01	2.4467E+01	1.3042E+04	5.6208E+00	0.000E+00	1.694E+00
7.648052E-01	3.35328E+01	2.3424E+01	1.1948E+04	5.7677E+00	0.000E+00	1.621E+00
8.175768E-01	3.54838E+01	2.1840E+01	1.0421E+04	5.9804E+00	0.000E+00	1.516E+00
8.739896E-01	3.69977E+01	2.0291E+01	9.0571E+03	6.1798E+00	0.000E+00	1.419E+00
9.342948E-01	3.82082E+01	1.8813E+01	7.8551E+03	6.3641E+00	0.000E+00	1.327E+00
9.987612E-01	3.92179E+01	1.7415E+01	6.8020E+03	6.5320E+00	0.000E+00	1.241E+00
1.067676E+00	4.00468E+01	1.5985E+01	5.8407E+03	6.6821E+00	0.000E+00	1.161E+00
1.141345E+00	4.06725E+01	1.4642E+01	5.0045E+03	6.8133E+00	0.000E+00	1.086E+00
1.220098E+00	4.11291E+01	1.3398E+01	4.2839E+03	6.9244E+00	0.000E+00	1.016E+00
1.304285E+00	4.14587E+01	1.2245E+01	3.6626E+03	7.0148E+00	0.000E+00	9.506E-01
1.394281E+00	4.16876E+01	1.1189E+01	3.1306E+03	7.0838E+00	0.000E+00	8.892E-01
1.490486E+00	4.18417E+01	1.0211E+01	2.6725E+03	7.1310E+00	0.000E+00	8.318E-01
1.593329E+00	4.18978E+01	9.2467E+00	2.2640E+03	7.1563E+00	0.000E+00	7.781E-01

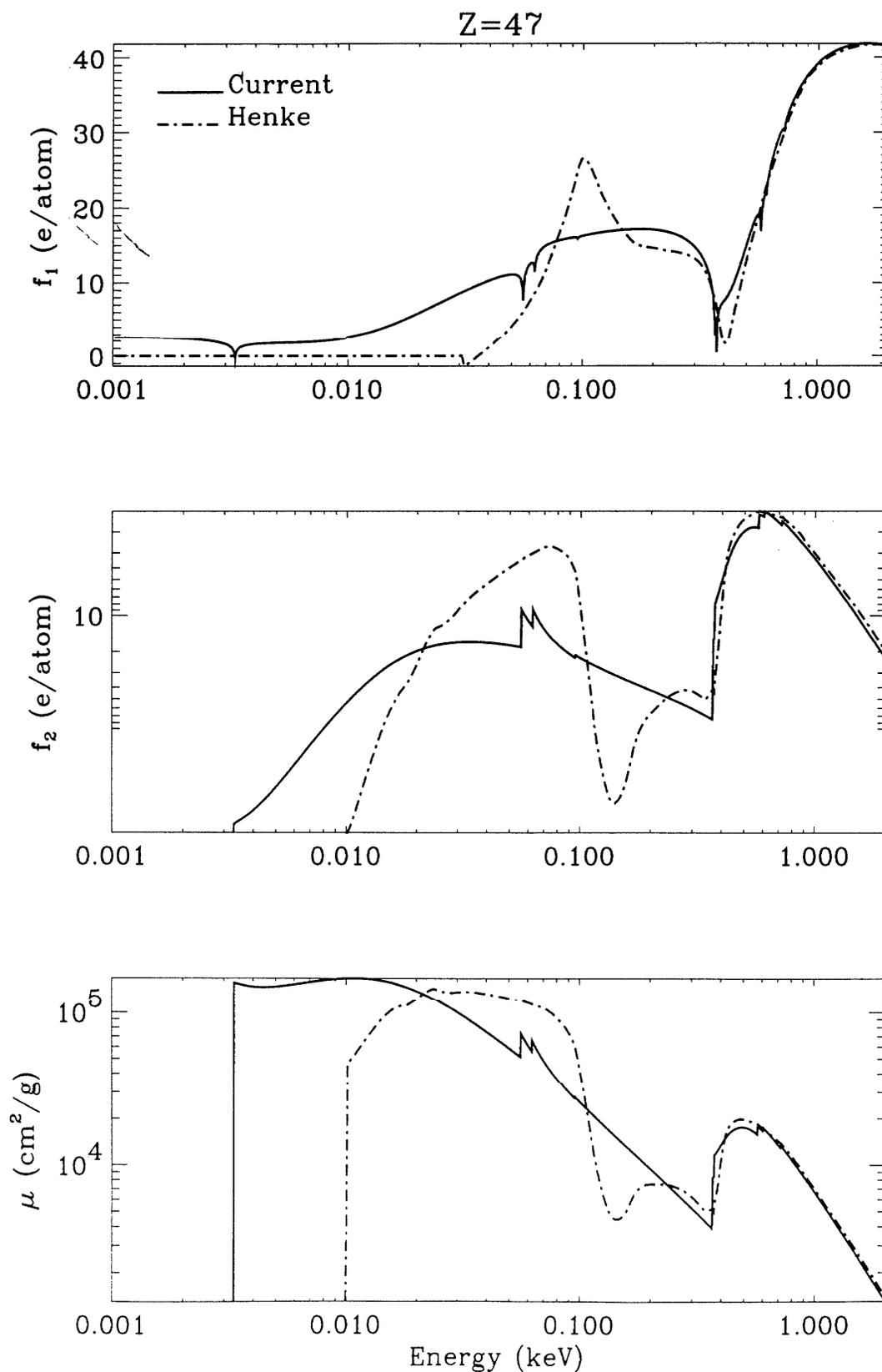
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 349

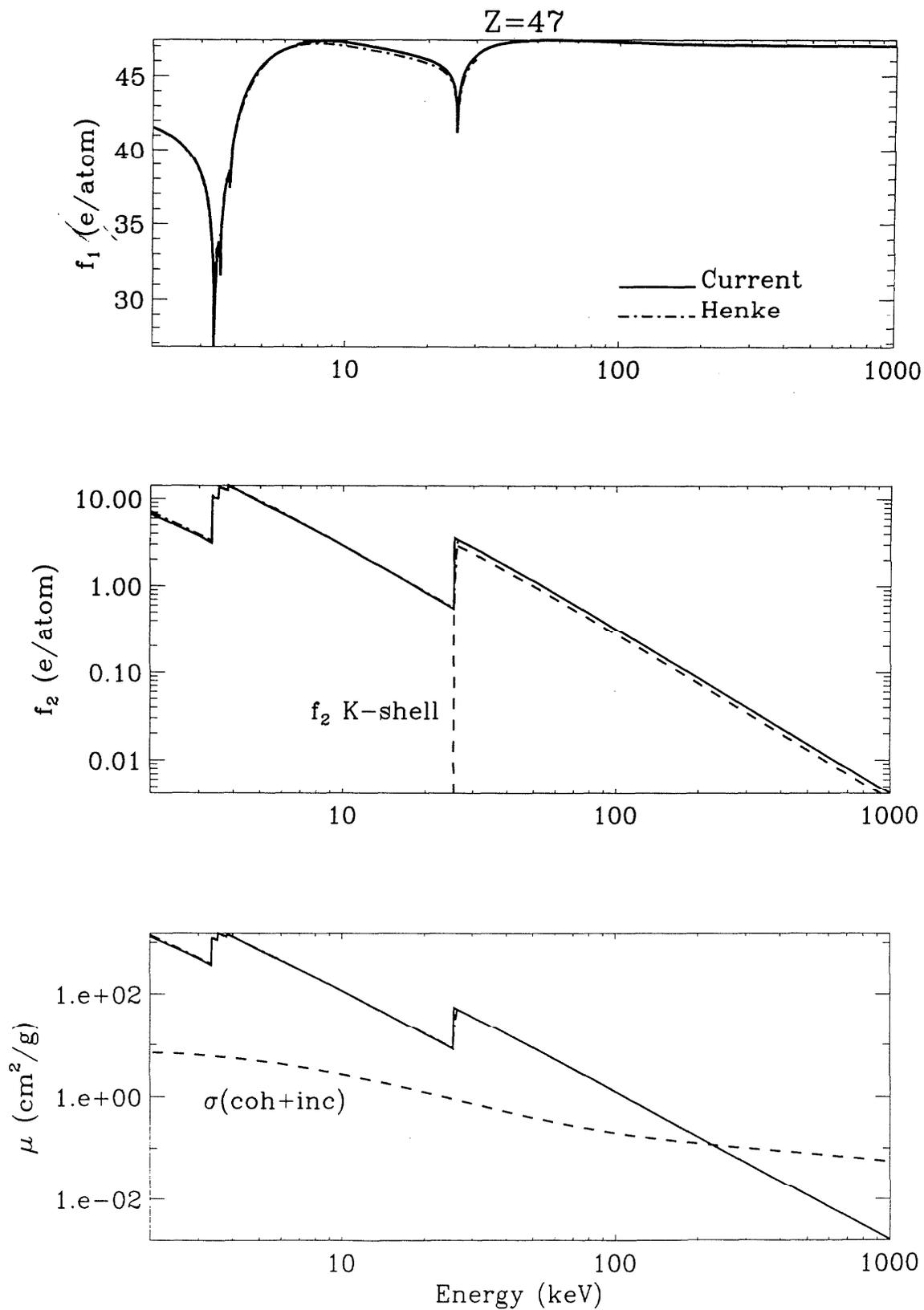
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(cob+inc) cm ² /g	μ _K cm ² /g	λ nm
1.703269E+00	4.18626E+01	8.3868E+00	1.9209E+03	7.1596E+00	0.000E+00	7.279E-01
1.820795E+00	4.17704E+01	7.6195E+00	1.6325E+03	7.1411E+00	0.000E+00	6.809E-01
1.946430E+00	4.16141E+01	6.9336E+00	1.3897E+03	7.1014E+00	0.000E+00	6.370E-01
2.080733E+00	4.14062E+01	6.3204E+00	1.1850E+03	7.0409E+00	0.000E+00	5.959E-01
2.224304E+00	4.11462E+01	5.7714E+00	1.0122E+03	6.9606E+00	0.000E+00	5.574E-01
2.377781E+00	4.08180E+01	5.2608E+00	8.6310E+02	6.8613E+00	0.000E+00	5.214E-01
2.541848E+00	4.03771E+01	4.7785E+00	7.3338E+02	6.7442E+00	0.000E+00	4.878E-01
2.717235E+00	3.97652E+01	4.3434E+00	6.2357E+02	6.6103E+00	0.000E+00	4.563E-01
2.904724E+00	3.88627E+01	3.9522E+00	5.3078E+02	6.4612E+00	0.000E+00	4.268E-01
3.105150E+00	3.73492E+01	3.5510E+00	4.4612E+02	6.2981E+00	0.000E+00	3.993E-01
3.284078E+00	3.59635E+01	3.2163E+00	3.8206E+02	6.1515E+00	0.000E+00	3.775E-01
3.319406E+00	3.20969E+01	3.1564E+00	3.7095E+02	6.1226E+00	0.000E+00	3.735E-01
3.334344E+00	3.05512E+01	3.1317E+00	3.6640E+02	6.1104E+00	0.000E+00	3.718E-01
3.347749E+00	2.67378E+01	3.1097E+00	3.6237E+02	6.0994E+00	0.000E+00	3.704E-01
3.367855E+00	3.02844E+01	1.0402E+01	1.2049E+03	6.0830E+00	0.000E+00	3.681E-01
3.418122E+00	3.31732E+01	1.0281E+01	1.1734E+03	6.0419E+00	0.000E+00	3.627E-01
3.453226E+00	3.37562E+01	1.0200E+01	1.1522E+03	6.0133E+00	0.000E+00	3.590E-01
3.506081E+00	3.32333E+01	1.0080E+01	1.1216E+03	5.9704E+00	0.000E+00	3.536E-01
3.520176E+00	3.15999E+01	1.0043E+01	1.1130E+03	5.9590E+00	0.000E+00	3.522E-01
3.541318E+00	3.37502E+01	1.3624E+01	1.5008E+03	5.9419E+00	0.000E+00	3.501E-01
3.548445E+00	3.42479E+01	1.3594E+01	1.4944E+03	5.9361E+00	0.000E+00	3.494E-01
3.594174E+00	3.60240E+01	1.3398E+01	1.4542E+03	5.8992E+00	0.000E+00	3.450E-01
3.729684E+00	3.81788E+01	1.2784E+01	1.3372E+03	5.7907E+00	0.000E+00	3.324E-01
3.786771E+00	3.81381E+01	1.2494E+01	1.2871E+03	5.7454E+00	0.000E+00	3.274E-01
3.793288E+00	3.79709E+01	1.2461E+01	1.2815E+03	5.7402E+00	0.000E+00	3.269E-01
3.801994E+00	3.73722E+01	1.2416E+01	1.2740E+03	5.7333E+00	0.000E+00	3.261E-01
3.824829E+00	3.85660E+01	1.4155E+01	1.4437E+03	5.7153E+00	0.000E+00	3.242E-01
3.881916E+00	3.99808E+01	1.3844E+01	1.3912E+03	5.6705E+00	0.000E+00	3.194E-01
4.055024E+00	4.20364E+01	1.2923E+01	1.2432E+03	5.5365E+00	0.000E+00	3.058E-01
4.334821E+00	4.38319E+01	1.1573E+01	1.0415E+03	5.3264E+00	0.000E+00	2.860E-01
4.633924E+00	4.49334E+01	1.0367E+01	8.7275E+02	5.1115E+00	0.000E+00	2.676E-01
4.953664E+00	4.56723E+01	9.3056E+00	7.3283E+02	4.8933E+00	0.000E+00	2.503E-01
5.295467E+00	4.61852E+01	8.3559E+00	6.1557E+02	4.6731E+00	0.000E+00	2.341E-01
5.660855E+00	4.65439E+01	7.5133E+00	5.1777E+02	4.4522E+00	0.000E+00	2.190E-01
6.051453E+00	4.67976E+01	6.7612E+00	4.3586E+02	4.2319E+00	0.000E+00	2.049E-01
6.469004E+00	4.69766E+01	6.0868E+00	3.6706E+02	4.0135E+00	0.000E+00	1.917E-01
6.915365E+00	4.71807E+01	5.4706E+00	3.0861E+02	3.7978E+00	0.000E+00	1.793E-01
7.392525E+00	4.72894E+01	4.9010E+00	2.5863E+02	3.5860E+00	0.000E+00	1.677E-01
7.902609E+00	4.73505E+01	4.3883E+00	2.1663E+02	3.3788E+00	0.000E+00	1.569E-01
8.447890E+00	4.73467E+01	3.9300E+00	1.8148E+02	3.1770E+00	0.000E+00	1.468E-01
9.030794E+00	4.73333E+01	3.5141E+00	1.5180E+02	2.9813E+00	0.000E+00	1.373E-01
9.653919E+00	4.72863E+01	3.1173E+00	1.2597E+02	2.7923E+00	0.000E+00	1.284E-01
1.032004E+01	4.72146E+01	2.7679E+00	1.0463E+02	2.6104E+00	0.000E+00	1.201E-01
1.103212E+01	4.71294E+01	2.4591E+00	8.6957E+01	2.4359E+00	0.000E+00	1.124E-01
1.179334E+01	4.70354E+01	2.1854E+00	7.2289E+01	2.2692E+00	0.000E+00	1.051E-01
1.260708E+01	4.69353E+01	1.9437E+00	6.0144E+01	2.1104E+00	0.000E+00	9.834E-02
1.347697E+01	4.68312E+01	1.7304E+00	5.0090E+01	1.9597E+00	0.000E+00	9.200E-02
1.440688E+01	4.67237E+01	1.5411E+00	4.1731E+01	1.8170E+00	0.000E+00	8.606E-02
1.540095E+01	4.66114E+01	1.3695E+00	3.4689E+01	1.6824E+00	0.000E+00	8.050E-02
1.646362E+01	4.64900E+01	1.2159E+00	2.8812E+01	1.5558E+00	0.000E+00	7.531E-02
1.759961E+01	4.63552E+01	1.0755E+00	2.3840E+01	1.4370E+00	0.000E+00	7.045E-02
1.881398E+01	4.61995E+01	9.5208E-01	1.9741E+01	1.3259E+00	0.000E+00	6.590E-02
2.011215E+01	4.60118E+01	8.4356E-01	1.6362E+01	1.2222E+00	0.000E+00	6.165E-02
2.149988E+01	4.57660E+01	7.4808E-01	1.3574E+01	1.1257E+00	0.000E+00	5.767E-02
2.298338E+01	4.53918E+01	6.6401E-01	1.1271E+01	1.0362E+00	0.000E+00	5.395E-02
2.456923E+01	4.45660E+01	5.8990E-01	9.3665E+00	9.5328E-01	0.000E+00	5.046E-02
2.500372E+01	4.40222E+01	5.7193E-01	8.9233E+00	9.3255E-01	0.000E+00	4.959E-02
2.538643E+01	4.27404E+01	5.5683E-01	8.5567E+00	9.1494E-01	0.000E+00	4.884E-02
2.548849E+01	4.11991E+01	5.5291E-01	8.4624E+00	9.1035E-01	0.000E+00	4.864E-02
2.564157E+01	4.27653E+01	3.5841E+00	5.4529E+01	9.0353E-01	0.000E+01	4.835E-02
2.602428E+01	4.41811E+01	3.4923E+00	5.2350E+01	8.8686E-01	4.436E+01	4.764E-02
2.626450E+01	4.45838E+01	3.4365E+00	5.1042E+01	8.7668E-01	4.325E+01	4.721E-02
2.807676E+01	4.58610E+01	3.0917E+00	4.2957E+01	8.0608E-01	3.655E+01	4.416E-02
3.001405E+01	4.64369E+01	2.7803E+00	3.6138E+01	7.4114E-01	3.088E+01	4.131E-02
3.208502E+01	4.67849E+01	2.4770E+00	3.0117E+01	6.8154E-01	2.580E+01	3.864E-02

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_k cm ² /g	λ nm
3.429889E+01	4.69986E+01	2.2014E+00	2.5038E+01	6.2695E-01	2.149E+01	3.615E-02
3.666551E+01	4.71402E+01	1.9609E+00	2.0863E+01	5.7704E-01	1.794E+01	3.381E-02
3.919543E+01	4.72353E+01	1.7469E+00	1.7386E+01	5.3149E-01	1.498E+01	3.163E-02
4.189992E+01	4.72982E+01	1.5564E+00	1.4491E+01	4.8999E-01	1.251E+01	2.959E-02
4.479101E+01	4.73384E+01	1.3868E+00	1.2079E+01	4.5223E-01	1.045E+01	2.768E-02
4.788159E+01	4.73627E+01	1.2359E+00	1.0069E+01	4.1793E-01	8.723E+00	2.589E-02
5.118542E+01	4.74096E+01	1.1011E+00	8.3924E+00	3.8681E-01	7.281E+00	2.422E-02
5.471721E+01	4.74120E+01	9.7517E-01	6.9525E+00	3.5861E-01	6.035E+00	2.266E-02
5.849270E+01	4.74053E+01	8.6367E-01	5.7602E+00	3.3308E-01	5.002E+00	2.120E-02
6.252870E+01	4.73930E+01	7.6500E-01	4.7727E+00	3.0998E-01	4.145E+00	1.983E-02
6.684318E+01	4.73772E+01	6.7765E-01	3.9549E+00	2.8909E-01	3.436E+00	1.855E-02
7.145536E+01	4.73593E+01	6.0032E-01	3.2774E+00	2.7021E-01	2.848E+00	1.735E-02
7.638578E+01	4.73402E+01	5.3180E-01	2.7159E+00	2.5314E-01	2.360E+00	1.623E-02
8.165640E+01	4.73210E+01	4.7041E-01	2.2474E+00	2.3772E-01	1.953E+00	1.518E-02
8.729069E+01	4.73010E+01	4.1471E-01	1.8534E+00	2.2376E-01	1.612E+00	1.420E-02
9.331374E+01	4.72805E+01	3.6563E-01	1.5286E+00	2.1113E-01	1.330E+00	1.329E-02
9.975239E+01	4.72603E+01	3.2238E-01	1.2608E+00	1.9968E-01	1.097E+00	1.243E-02
1.066353E+02	4.72407E+01	2.8427E-01	1.0399E+00	1.8930E-01	9.051E-01	1.163E-02
1.139931E+02	4.72220E+01	2.5054E-01	8.5741E-01	1.7986E-01	7.463E-01	1.088E-02
1.218587E+02	4.72041E+01	2.2070E-01	7.0652E-01	1.7125E-01	6.149E-01	1.017E-02
1.302669E+02	4.71872E+01	1.9442E-01	5.8222E-01	1.6340E-01	5.067E-01	9.518E-03
1.392553E+02	4.71713E+01	1.7128E-01	4.7981E-01	1.5620E-01	4.175E-01	8.903E-03
1.488640E+02	4.71564E+01	1.5090E-01	3.9543E-01	1.4959E-01	3.440E-01	8.329E-03
1.591356E+02	4.71426E+01	1.3295E-01	3.2591E-01	1.4349E-01	2.834E-01	7.791E-03
1.701159E+02	4.71298E+01	1.1714E-01	2.6863E-01	1.3784E-01	2.335E-01	7.288E-03
1.818539E+02	4.71180E+01	1.0322E-01	2.2142E-01	1.3260E-01	1.924E-01	6.818E-03
1.944018E+02	4.71071E+01	9.0955E-02	1.8252E-01	1.2771E-01	1.586E-01	6.378E-03
2.078156E+02	4.70971E+01	8.0152E-02	1.5046E-01	1.2313E-01	1.307E-01	5.966E-03
2.221548E+02	4.70880E+01	7.0635E-02	1.2404E-01	1.1882E-01	1.077E-01	5.581E-03
2.374835E+02	4.70796E+01	6.2250E-02	1.0226E-01	1.1475E-01	8.870E-02	5.221E-03
2.538699E+02	4.70720E+01	5.4863E-02	8.4306E-02	1.1088E-01	7.309E-02	4.884E-03
2.713869E+02	4.70650E+01	4.8355E-02	6.9508E-02	1.0721E-01	6.022E-02	4.569E-03
2.901126E+02	4.70587E+01	4.2620E-02	5.7311E-02	1.0369E-01	4.962E-02	4.274E-03
3.101304E+02	4.70529E+01	3.7567E-02	4.7255E-02	1.0032E-01	4.089E-02	3.998E-03
3.315294E+02	4.70477E+01	3.3114E-02	3.8965E-02	9.7085E-02	3.369E-02	3.740E-03
3.544049E+02	4.70429E+01	2.9190E-02	3.2131E-02	9.3960E-02	2.776E-02	3.498E-03
3.788588E+02	4.70386E+01	2.5732E-02	2.6496E-02	9.0938E-02	2.287E-02	3.273E-03
4.050001E+02	4.70348E+01	2.2684E-02	2.1850E-02	8.8009E-02	1.885E-02	3.061E-03
4.329451E+02	4.70313E+01	1.9998E-02	1.8020E-02	8.5166E-02	1.553E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z=1-92 353

Cd Z = 48

Atomic weight = 1.124100E+02 g/mol, nominal density ρ (g/cm³) = 8.6300E+00

μ_0 (barns/atom) = μ (cm²/g) \times 1.86661E+02, E(eV) μ (cm²/g) = f_2 (e/atom) \times 3.74347E+05

14 edges. Edge energies (keV):

K		2.67112E+00	L	I	4.01800E+00	L	II	3.72700E+00	L	III	3.53750E+00
M	I	7.70200E-00	M	II	6.50700E-00	M	III	6.16500E-00	M	IV	4.10500E-01
M	V	4.03700E-00	N	I	1.07600E-00	N	II	6.69000E-02	N	III	6.69000E-02
N	IV	9.30000E-03	N	V	9.30000E-03						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -4.7951E-01, -2.9760E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.1244E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
9.114000E-03	-2.55482E-01	0.0000E+00	0.0000E+00	3.8335E-05	0.000E+00	1.360E+02
9.253500E-03	-1.31522E+00	0.0000E+00	0.0000E+00	4.1467E-05	0.000E+00	1.340E+02
9.290700E-03	-2.57675E+00	0.0000E+00	0.0000E+00	4.2334E-05	0.000E+00	1.334E+02
9.346500E-03	-1.23253E+00	2.4746E+00	9.9114E+04	4.3660E-05	0.000E+00	1.327E+02
9.486000E-03	-8.88866E-02	2.3409E+00	9.2377E+04	4.7112E-05	0.000E+00	1.307E+02
1.069000E-02	8.05089E-01	1.5527E+00	5.4375E+04	8.6151E-05	0.000E+00	1.160E+02
1.142761E-02	4.47887E-01	1.4576E+00	4.7747E+04	1.1972E-04	0.000E+00	1.085E+02
1.221612E-02	-4.65177E-02	1.5479E+00	4.7432E+04	1.6544E-04	0.000E+00	1.015E+02
1.305903E-02	-6.38675E-01	1.8001E+00	5.1600E+04	2.2733E-04	0.000E+00	9.494E+01
1.396010E-02	-1.31418E+00	2.2301E+00	5.9801E+04	3.1064E-04	0.000E+00	8.881E+01
1.492335E-02	-2.05340E+00	2.8761E+00	7.2145E+04	4.2213E-04	0.000E+00	8.308E+01
1.595306E-02	-2.81785E+00	3.7878E+00	8.8882E+04	5.7048E-04	0.000E+00	7.772E+01
1.705382E-02	-3.54108E+00	5.0153E+00	1.1009E+05	7.6675E-04	0.000E+00	7.270E+01
1.823053E-02	-4.12454E+00	6.5929E+00	1.3538E+05	1.0249E-03	0.000E+00	6.801E+01
1.948844E-02	-4.44143E+00	8.5207E+00	1.6367E+05	1.3627E-03	0.000E+00	6.362E+01
2.083314E-02	-4.35157E+00	1.0746E+01	1.9310E+05	1.8020E-03	0.000E+00	5.951E+01
2.227063E-02	-3.72673E+00	1.3156E+01	2.2114E+05	2.3703E-03	0.000E+00	5.567E+01
2.380730E-02	-2.48166E+00	1.5578E+01	2.4494E+05	3.1013E-03	0.000E+00	5.208E+01
2.545001E-02	-6.01492E-01	1.7804E+01	2.6188E+05	4.0364E-03	0.000E+00	4.872E+01
2.720606E-02	1.84418E+00	1.9625E+01	2.7003E+05	5.2259E-03	0.000E+00	4.557E+01
2.908327E-02	4.65148E+00	2.0871E+01	2.6864E+05	6.7309E-03	0.000E+00	4.263E+01
3.109002E-02	7.72864E+00	2.1439E+01	2.5814E+05	8.6246E-03	0.000E+00	3.988E+01
3.323523E-02	1.07988E+01	2.1312E+01	2.4005E+05	1.0995E-02	0.000E+00	3.731E+01
3.552846E-02	1.36598E+01	2.0551E+01	2.1654E+05	1.3944E-02	0.000E+00	3.490E+01
3.797993E-02	1.61566E+01	1.9278E+01	1.9001E+05	1.7596E-02	0.000E+00	3.264E+01
4.060054E-02	1.81877E+01	1.7636E+01	1.6261E+05	2.2093E-02	0.000E+00	3.054E+01
4.340198E-02	1.97108E+01	1.5795E+01	1.3623E+05	2.7601E-02	0.000E+00	2.857E+01
4.639671E-02	2.07453E+01	1.3904E+01	1.1218E+05	3.4311E-02	0.000E+00	2.672E+01
4.959809E-02	2.13457E+01	1.2077E+01	9.1154E+04	4.2442E-02	0.000E+00	2.500E+01
5.302035E-02	2.15780E+01	1.0390E+01	7.3356E+04	5.2244E-02	0.000E+00	2.338E+01
5.667876E-02	2.14957E+01	8.8820E+00	5.8663E+04	6.3999E-02	0.000E+00	2.187E+01
6.058959E-02	2.10974E+01	7.5685E+00	4.6761E+04	7.8021E-02	0.000E+00	2.046E+01
6.477028E-02	2.00512E+01	6.4461E+00	3.7256E+04	9.4660E-02	0.000E+00	1.914E+01
6.556200E-02	1.95940E+01	6.2613E+00	3.5751E+04	9.8001E-02	0.000E+00	1.891E+01
6.656550E-02	1.81776E+01	6.0383E+00	3.3958E+04	1.0232E-01	0.000E+00	1.863E+01
6.683310E-02	1.64471E+01	5.9809E+00	3.3500E+04	1.0349E-01	0.000E+00	1.855E+01
6.723450E-02	1.83530E+01	9.3131E+00	5.1853E+04	1.0526E-01	0.000E+00	1.844E+01
6.823800E-02	1.99870E+01	8.8611E+00	4.8611E+04	1.0974E-01	0.000E+00	1.817E+01
6.923942E-02	2.06144E+01	8.4419E+00	4.5642E+04	1.1430E-01	0.000E+00	1.791E+01
7.401695E-02	2.14606E+01	6.8057E+00	3.4421E+04	1.3737E-01	0.000E+00	1.675E+01
7.912411E-02	2.41377E+01	5.6179E+00	2.6579E+04	1.6432E-01	0.000E+00	1.567E+01
8.458368E-02	2.10768E+01	4.7652E+00	2.1090E+04	1.9565E-01	0.000E+00	1.466E+01
9.041995E-02	2.07147E+01	4.1313E+00	1.7104E+04	2.3188E-01	0.000E+00	1.371E+01
9.665893E-02	2.03349E+01	3.6500E+00	1.4136E+04	2.7356E-01	0.000E+00	1.283E+01
1.033284E-01	1.99289E+01	3.2803E+00	1.1884E+04	3.2126E-01	0.000E+00	1.200E+01
1.054480E-01	1.97777E+01	3.1855E+00	1.1309E+04	3.3707E-01	0.000E+00	1.176E+01
1.070620E-01	1.95992E+01	3.1194E+00	1.0907E+04	3.4930E-01	0.000E+00	1.158E+01
1.074924E-01	1.94588E+01	3.1025E+00	1.0805E+04	3.5259E-01	0.000E+00	1.153E+01
1.081380E-01	1.95484E+01	3.3138E+00	1.1472E+04	3.5755E-01	0.000E+00	1.147E+01
1.097520E-01	1.95803E+01	3.2602E+00	1.1120E+04	3.7006E-01	0.000E+00	1.130E+01
1.104581E-01	1.95713E+01	3.2381E+00	1.0974E+04	3.7559E-01	0.000E+00	1.122E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.180797E-01	1.93730E+01	3.0421E+00	9.6445E+03	4.3714E-01	0.000E+00	1.050E+01
1.262272E-01	1.91492E+01	2.8981E+00	8.5949E+03	5.0651E-01	0.000E+00	9.822E+00
1.349368E-01	1.89330E+01	2.7933E+00	7.7493E+03	5.8432E-01	0.000E+00	9.188E+00
1.442475E-01	1.87262E+01	2.7191E+00	7.0566E+03	6.7113E-01	0.000E+00	8.595E+00
1.542005E-01	1.85253E+01	2.6687E+00	6.4786E+03	7.6750E-01	0.000E+00	8.040E+00
1.648404E-01	1.83249E+01	2.6363E+00	5.9869E+03	8.7393E-01	0.000E+00	7.521E+00
1.762144E-01	1.81169E+01	2.6226E+00	5.5714E+03	9.9088E-01	0.000E+00	7.036E+00
1.883732E-01	1.79042E+01	2.6536E+00	5.2733E+03	1.1187E+00	0.000E+00	6.582E+00
2.013709E-01	1.76951E+01	2.6910E+00	5.0026E+03	1.2578E+00	0.000E+00	6.157E+00
2.152655E-01	1.74569E+01	2.7323E+00	4.7515E+03	1.4082E+00	0.000E+00	5.760E+00
2.301188E-01	1.71855E+01	2.7750E+00	4.5143E+03	1.5702E+00	0.000E+00	5.388E+00
2.459970E-01	1.68631E+01	2.8169E+00	4.2867E+03	1.7435E+00	0.000E+00	5.040E+00
2.629708E-01	1.64655E+01	2.8562E+00	4.0659E+03	1.9282E+00	0.000E+00	4.715E+00
2.811158E-01	1.59582E+01	2.8906E+00	3.8493E+03	2.1239E+00	0.000E+00	4.410E+00
3.005128E-01	1.52867E+01	2.9178E+00	3.6347E+03	2.3301E+00	0.000E+00	4.126E+00
3.212482E-01	1.43590E+01	2.9368E+00	3.4222E+03	2.5462E+00	0.000E+00	3.859E+00
3.434143E-01	1.29964E+01	2.9468E+00	3.2123E+03	2.7714E+00	0.000E+00	3.610E+00
3.671099E-01	1.07613E+01	2.9475E+00	3.0056E+03	3.0048E+00	0.000E+00	3.377E+00
3.924405E-01	5.74265E+00	2.9384E+00	2.8029E+03	3.2454E+00	0.000E+00	3.159E+00
3.956260E-01	4.46424E+00	2.9367E+00	2.7787E+03	3.2749E+00	0.000E+00	3.134E+00
4.016815E-01	-1.52779E-01	2.9330E+00	2.7334E+03	3.3307E+00	0.000E+00	3.087E+00
4.022900E-01	-1.19614E+00	2.9326E+00	2.7289E+03	3.3363E+00	0.000E+00	3.082E+00
4.032963E-01	-4.55670E+00	2.9320E+00	2.7215E+03	3.3455E+00	0.000E+00	3.074E+00
4.057185E-01	-1.56461E+00	1.0686E+01	9.8600E+03	3.3676E+00	0.000E+00	3.056E+00
4.084475E-01	-1.12406E+00	1.0825E+01	9.9208E+03	3.3924E+00	0.000E+00	3.036E+00
4.100895E-01	-3.26016E+00	1.0908E+01	9.9577E+03	3.4072E+00	0.000E+00	3.023E+00
4.117740E-01	-9.11513E-01	1.6362E+01	1.4875E+04	3.4224E+00	0.000E+00	3.011E+00
4.125525E-01	6.86458E-02	1.6428E+01	1.4907E+04	3.4295E+00	0.000E+00	3.005E+00
4.187100E-01	3.39588E+00	1.6954E+01	1.5157E+04	3.4846E+00	0.000E+00	2.961E+00
4.195189E-01	3.65174E+00	1.7024E+01	1.5191E+04	3.4918E+00	0.000E+00	2.955E+00
4.484657E-01	8.37082E+00	1.9663E+01	1.6413E+04	3.7427E+00	0.000E+00	2.765E+00
4.794098E-01	1.19797E+01	2.2013E+01	1.7189E+04	3.9966E+00	0.000E+00	2.586E+00
5.124891E-01	1.54735E+01	2.3387E+01	1.7083E+04	4.2519E+00	0.000E+00	2.419E+00
5.478508E-01	1.86093E+01	2.3936E+01	1.6356E+04	4.5069E+00	0.000E+00	2.263E+00
5.856525E-01	2.10086E+01	2.3768E+01	1.5193E+04	4.7597E+00	0.000E+00	2.117E+00
6.041700E-01	2.13556E+01	2.3501E+01	1.4561E+04	4.8765E+00	0.000E+00	2.052E+00
6.134175E-01	2.04904E+01	2.3338E+01	1.4242E+04	4.9330E+00	0.000E+00	2.021E+00
6.158835E-01	1.89637E+01	2.3292E+01	1.4157E+04	4.9479E+00	0.000E+00	2.013E+00
6.195825E-01	2.08403E+01	2.6480E+01	1.5999E+04	4.9701E+00	0.000E+00	2.001E+00
6.260625E-01	2.23481E+01	2.6351E+01	1.5756E+04	5.0086E+00	0.000E+00	1.980E+00
6.288300E-01	2.27411E+01	2.6294E+01	1.5653E+04	5.0249E+00	0.000E+00	1.972E+00
6.376860E-01	2.36380E+01	2.6105E+01	1.5325E+04	5.0763E+00	0.000E+00	1.944E+00
6.474465E-01	2.40110E+01	2.5888E+01	1.4968E+04	5.1318E+00	0.000E+00	1.915E+00
6.500493E-01	2.35362E+01	2.5828E+01	1.4874E+04	5.1464E+00	0.000E+00	1.907E+00
6.539535E-01	2.45866E+01	2.7128E+01	1.5529E+04	5.1682E+00	0.000E+00	1.896E+00
6.637140E-01	2.59872E+01	2.6905E+01	1.5175E+04	5.2217E+00	0.000E+00	1.868E+00
6.692609E-01	2.65609E+01	2.6776E+01	1.4977E+04	5.2517E+00	0.000E+00	1.853E+00
7.154399E-01	3.00001E+01	2.5514E+01	1.3350E+04	5.4870E+00	0.000E+00	1.733E+00
7.547960E-01	3.17476E+01	2.4279E+01	1.2041E+04	5.6691E+00	0.000E+00	1.643E+00
7.648052E-01	3.18609E+01	2.3969E+01	1.1732E+04	5.7129E+00	0.000E+00	1.621E+00
7.663490E-01	3.18163E+01	2.3922E+01	1.1685E+04	5.7195E+00	0.000E+00	1.618E+00
7.694298E-01	3.14077E+01	2.3827E+01	1.1592E+04	5.7327E+00	0.000E+00	1.611E+00
7.740510E-01	3.21559E+01	2.4751E+01	1.1970E+04	5.7524E+00	0.000E+00	1.602E+00
7.856040E-01	3.31070E+01	2.4400E+01	1.1627E+04	5.8006E+00	0.000E+00	1.578E+00
8.175768E-01	3.46667E+01	2.3457E+01	1.0740E+04	5.9273E+00	0.000E+00	1.516E+00
8.739896E-01	3.65926E+01	2.1905E+01	9.3823E+03	6.1287E+00	0.000E+00	1.419E+00
9.342948E-01	3.81048E+01	2.0411E+01	8.1780E+03	6.3154E+00	0.000E+00	1.327E+00
9.987612E-01	3.93637E+01	1.8998E+01	7.1208E+03	6.4859E+00	0.000E+00	1.241E+00
1.067676E+00	4.04395E+01	1.7471E+01	6.1257E+03	6.6387E+00	0.000E+00	1.161E+00
1.141345E+00	4.12418E+01	1.6005E+01	5.2494E+03	6.7728E+00	0.000E+00	1.086E+00
1.220098E+00	4.18352E+01	1.4641E+01	4.4922E+03	6.8871E+00	0.000E+00	1.016E+00
1.304285E+00	4.22838E+01	1.3382E+01	3.8409E+03	6.9807E+00	0.000E+00	9.506E-01
1.394281E+00	4.25930E+01	1.2216E+01	3.2799E+03	7.0530E+00	0.000E+00	8.892E-01
1.490486E+00	4.28011E+01	1.1152E+01	2.8008E+03	7.1035E+00	0.000E+00	8.318E-01
1.593329E+00	4.29337E+01	1.0182E+01	2.3923E+03	7.1321E+00	0.000E+00	7.781E-01

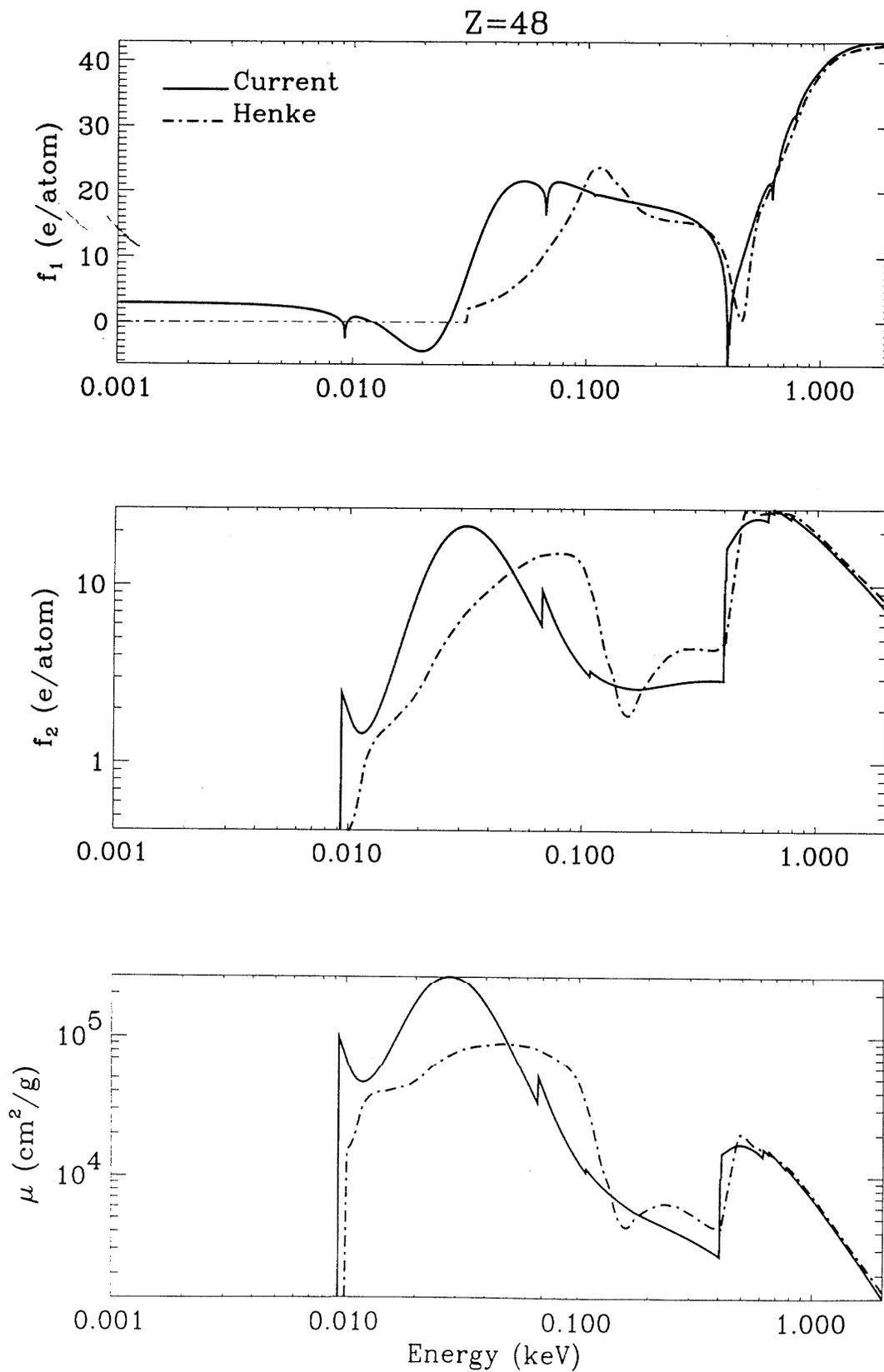
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 355

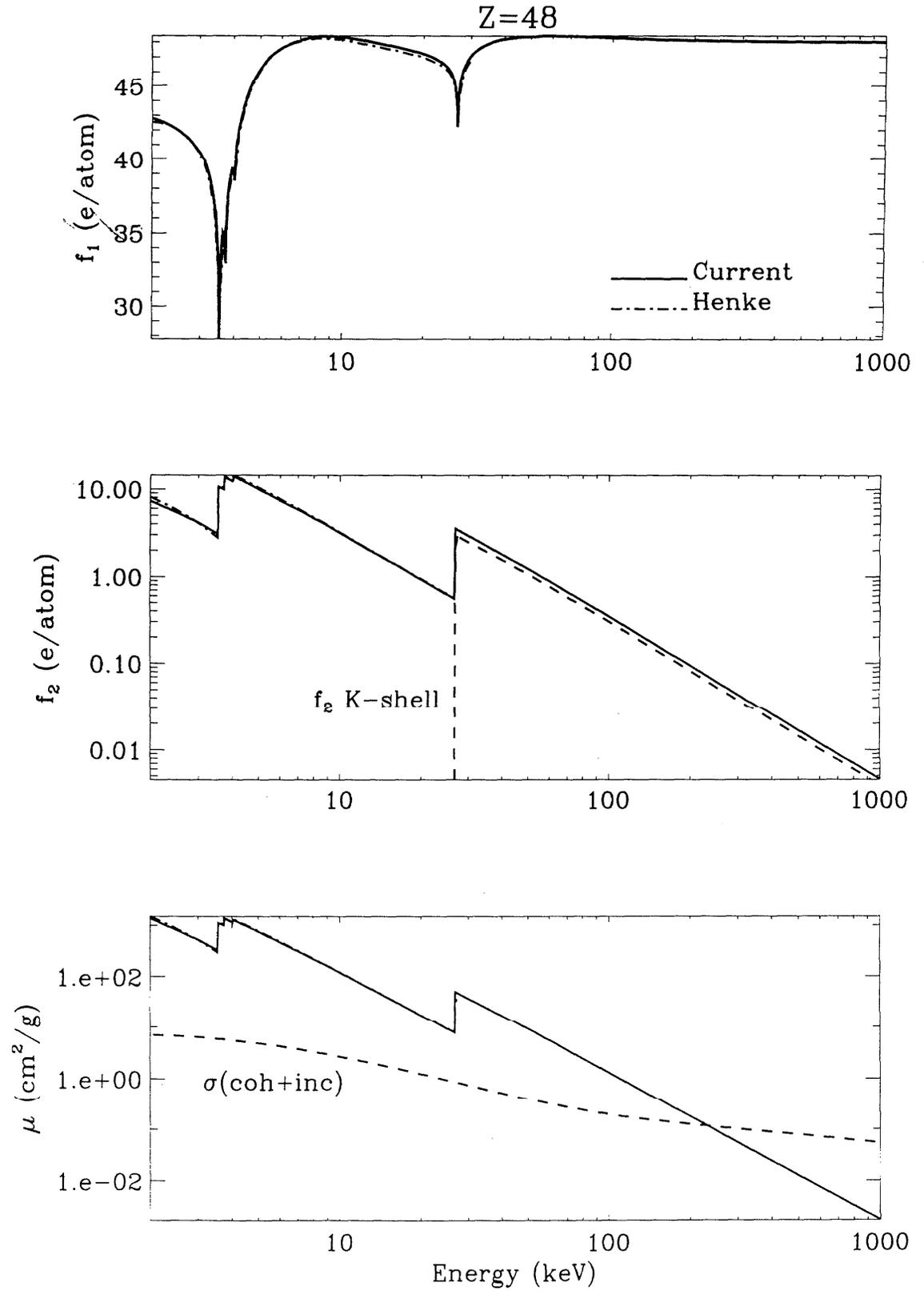
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.703269E+00	4.29952E+01	9.2462E+00	2.0321E+03	7.1388E+00	0.000E+00	7.279E-01
1.820795E+00	4.29620E+01	8.3851E+00	1.7239E+03	7.1236E+00	0.000E+00	6.809E-01
1.946430E+00	4.28569E+01	7.6167E+00	1.4649E+03	7.0871E+00	0.000E+00	6.370E-01
2.080733E+00	4.26965E+01	6.9297E+00	1.2467E+03	7.0298E+00	0.000E+00	5.959E-01
2.224304E+00	4.24829E+01	6.3148E+00	1.0628E+03	6.9525E+00	0.000E+00	5.574E-01
2.377781E+00	4.22148E+01	5.7641E+00	9.0747E+02	6.8560E+00	0.000E+00	5.214E-01
2.541848E+00	4.18768E+01	5.2570E+00	7.7422E+02	6.7415E+00	0.000E+00	4.878E-01
2.717235E+00	4.14267E+01	4.7781E+00	6.5827E+02	6.6102E+00	0.000E+00	4.563E-01
2.904724E+00	4.08113E+01	4.3441E+00	5.5984E+02	6.4634E+00	0.000E+00	4.268E-01
3.105150E+00	3.99196E+01	3.9055E+00	4.7084E+02	6.3024E+00	0.000E+00	3.993E-01
3.319406E+00	3.80892E+01	3.4718E+00	3.9153E+02	6.1288E+00	0.000E+00	3.735E-01
3.466750E+00	3.51406E+01	3.2183E+00	3.4752E+02	6.0097E+00	0.000E+00	3.576E-01
3.519812E+00	3.16870E+01	3.1345E+00	3.3337E+02	5.9670E+00	0.000E+00	3.522E-01
3.533962E+00	2.77885E+01	3.1128E+00	3.2974E+02	5.9556E+00	0.000E+00	3.508E-01
3.548445E+00	3.03560E+01	1.0619E+01	1.1203E+03	5.9440E+00	0.000E+00	3.494E-01
3.555187E+00	3.14895E+01	1.0592E+01	1.1152E+03	5.9386E+00	0.000E+00	3.487E-01
3.608250E+00	3.45292E+01	1.0378E+01	1.0766E+03	5.8961E+00	0.000E+00	3.436E-01
3.652460E+00	3.52329E+01	1.0205E+01	1.0459E+03	5.8609E+00	0.000E+00	3.395E-01
3.708365E+00	3.46373E+01	9.9942E+00	1.0089E+03	5.8165E+00	0.000E+00	3.343E-01
3.723273E+00	3.29486E+01	9.9338E+00	9.9877E+02	5.8047E+00	0.000E+00	3.330E-01
3.745635E+00	3.51307E+01	1.3575E+01	1.3567E+03	5.7871E+00	0.000E+00	3.310E-01
3.793288E+00	3.71821E+01	1.3324E+01	1.3149E+03	5.7496E+00	0.000E+00	3.269E-01
3.801540E+00	3.73998E+01	1.3281E+01	1.3078E+03	5.7431E+00	0.000E+00	3.261E-01
3.937640E+00	3.93697E+01	1.2588E+01	1.1967E+03	5.6371E+00	0.000E+00	3.149E-01
3.997910E+00	3.92963E+01	1.2284E+01	1.1502E+03	5.5907E+00	0.000E+00	3.101E-01
4.013982E+00	3.85238E+01	1.2204E+01	1.1382E+03	5.5784E+00	0.000E+00	3.089E-01
4.038090E+00	3.97007E+01	1.3936E+01	1.2919E+03	5.5600E+00	0.000E+00	3.070E-01
4.055024E+00	4.02290E+01	1.3848E+01	1.2784E+03	5.5471E+00	0.000E+00	3.058E-01
4.098360E+00	4.10801E+01	1.3626E+01	1.2446E+03	5.5142E+00	0.000E+00	3.025E-01
4.334821E+00	4.34595E+01	1.2493E+01	1.0788E+03	5.3381E+00	0.000E+00	2.860E-01
4.633924E+00	4.50537E+01	1.1248E+01	9.0863E+02	5.1240E+00	0.000E+00	2.676E-01
4.953664E+00	4.60867E+01	1.0110E+01	7.6398E+02	4.9064E+00	0.000E+00	2.503E-01
5.295467E+00	4.67933E+01	9.0844E+00	6.4220E+02	4.6867E+00	0.000E+00	2.341E-01
5.660855E+00	4.72835E+01	8.1591E+00	5.3955E+02	4.4661E+00	0.000E+00	2.190E-01
6.051453E+00	4.76250E+01	7.3317E+00	4.5355E+02	4.2460E+00	0.000E+00	2.049E-01
6.469004E+00	4.78624E+01	6.5913E+00	3.8142E+02	4.0275E+00	0.000E+00	1.917E-01
6.915365E+00	4.80258E+01	5.9281E+00	3.2091E+02	3.8117E+00	0.000E+00	1.793E-01
7.392525E+00	4.82126E+01	5.3234E+00	2.6957E+02	3.5996E+00	0.000E+00	1.677E-01
7.902609E+00	4.83099E+01	4.7715E+00	2.2603E+02	3.3921E+00	0.000E+00	1.569E-01
8.447890E+00	4.83643E+01	4.2744E+00	1.8941E+02	3.1899E+00	0.000E+00	1.468E-01
9.030794E+00	4.83786E+01	3.8216E+00	1.5841E+02	2.9937E+00	0.000E+00	1.373E-01
9.653919E+00	4.83459E+01	3.3892E+00	1.3142E+02	2.8041E+00	0.000E+00	1.284E-01
1.032004E+01	4.82818E+01	3.0085E+00	1.0913E+02	2.6215E+00	0.000E+00	1.201E-01
1.103212E+01	4.82016E+01	2.6731E+00	9.0706E+01	2.4464E+00	0.000E+00	1.124E-01
1.179334E+01	4.81115E+01	2.3769E+00	7.5447E+01	2.2790E+00	0.000E+00	1.051E-01
1.260708E+01	4.80147E+01	2.1138E+00	6.2766E+01	2.1195E+00	0.000E+00	9.834E-02
1.347697E+01	4.79129E+01	1.8813E+00	5.2257E+01	1.9680E+00	0.000E+00	9.200E-02
1.440688E+01	4.78076E+01	1.6761E+00	4.3551E+01	1.8246E+00	0.000E+00	8.606E-02
1.540095E+01	4.76992E+01	1.4934E+00	3.6299E+01	1.6893E+00	0.000E+00	8.050E-02
1.646362E+01	4.75850E+01	1.3271E+00	3.0175E+01	1.5619E+00	0.000E+00	7.531E-02
1.759961E+01	4.74612E+01	1.1782E+00	2.5061E+01	1.4424E+00	0.000E+00	7.045E-02
1.881398E+01	4.73218E+01	1.0427E+00	2.0747E+01	1.3307E+00	0.000E+00	6.590E-02
2.011215E+01	4.71592E+01	9.2363E-01	1.7192E+01	1.2263E+00	0.000E+00	6.165E-02
2.149988E+01	4.69590E+01	8.1889E-01	1.4258E+01	1.1293E+00	0.000E+00	5.767E-02
2.298338E+01	4.66870E+01	7.2667E-01	1.1836E+01	1.0391E+00	0.000E+00	5.395E-02
2.456923E+01	4.62404E+01	6.4542E-01	9.8338E+00	9.5568E-01	0.000E+00	5.046E-02
2.617698E+01	4.50549E+01	5.7713E-01	8.2533E+00	8.8228E-01	0.000E+00	4.736E-02
2.626450E+01	4.48946E+01	5.7375E-01	8.1777E+00	8.7857E-01	0.000E+00	4.721E-02
2.657764E+01	4.37823E+01	5.6193E-01	7.9149E+00	8.6551E-01	0.000E+00	4.665E-02
2.668449E+01	4.22514E+01	5.5799E-01	7.8279E+00	8.6113E-01	0.000E+00	4.646E-02
2.684476E+01	4.38062E+01	3.5688E+00	4.9766E+01	8.5464E-01	4.208E+01	4.619E-02
2.724542E+01	4.52128E+01	3.4780E+00	4.7787E+01	8.3878E-01	4.043E+01	4.551E-02
2.807676E+01	4.61921E+01	3.3013E+00	4.4016E+01	8.0749E-01	3.728E+01	4.416E-02
3.001405E+01	4.70987E+01	2.9524E+00	3.6824E+01	7.4211E-01	3.130E+01	4.131E-02
3.208502E+01	4.75564E+01	2.6447E+00	3.0857E+01	6.8211E-01	2.632E+01	3.864E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
3.429889E+01	4.78434E+01	2.3707E+00	2.5874E+01	6.2715E-01	2.214E+01	3.615E-02
3.666551E+01	4.80376E+01	2.1173E+00	2.1618E+01	5.7691E-01	1.855E+01	3.381E-02
3.919543E+01	4.81669E+01	1.8884E+00	1.8035E+01	5.3106E-01	1.551E+01	3.163E-02
4.189992E+01	4.82538E+01	1.6831E+00	1.5037E+01	4.8929E-01	1.296E+01	2.959E-02
4.479101E+01	4.83108E+01	1.4993E+00	1.2530E+01	4.5130E-01	1.081E+01	2.768E-02
4.788159E+01	4.83465E+01	1.3351E+00	1.0438E+01	4.1680E-01	9.021E+00	2.589E-02
5.118542E+01	4.83670E+01	1.1886E+00	8.6932E+00	3.8550E-01	7.524E+00	2.422E-02
5.471721E+01	4.84096E+01	1.0564E+00	7.2273E+00	3.5715E-01	6.261E+00	2.266E-02
5.849270E+01	4.84082E+01	9.3595E-01	5.9900E+00	3.3149E-01	5.191E+00	2.120E-02
6.252870E+01	4.83995E+01	8.2931E-01	4.9649E+00	3.0829E-01	4.304E+00	1.983E-02
6.684318E+01	4.83861E+01	7.3488E-01	4.1156E+00	2.8732E-01	3.569E+00	1.855E-02
7.145536E+01	4.83697E+01	6.5126E-01	3.4119E+00	2.6837E-01	2.959E+00	1.735E-02
7.638578E+01	4.83515E+01	5.7719E-01	2.8287E+00	2.5126E-01	2.453E+00	1.623E-02
8.165640E+01	4.83330E+01	5.1076E-01	2.3415E+00	2.3580E-01	2.031E+00	1.518E-02
8.729069E+01	4.83135E+01	4.5045E-01	1.9318E+00	2.2183E-01	1.677E+00	1.420E-02
9.331374E+01	4.82930E+01	3.9729E-01	1.5938E+00	2.0920E-01	1.384E+00	1.329E-02
9.975239E+01	4.82726E+01	3.5043E-01	1.3151E+00	1.9776E-01	1.142E+00	1.243E-02
1.066353E+02	4.82525E+01	3.0911E-01	1.0851E+00	1.8739E-01	9.428E-01	1.163E-02
1.139931E+02	4.82333E+01	2.7268E-01	8.9548E-01	1.7797E-01	7.782E-01	1.088E-02
1.218587E+02	4.82149E+01	2.4040E-01	7.3849E-01	1.6939E-01	6.418E-01	1.017E-02
1.302669E+02	4.81974E+01	2.1190E-01	6.0893E-01	1.6157E-01	5.292E-01	9.518E-03
1.392553E+02	4.81809E+01	1.8679E-01	5.0213E-01	1.5441E-01	4.363E-01	8.903E-03
1.488640E+02	4.81654E+01	1.6466E-01	4.1408E-01	1.4784E-01	3.597E-01	8.329E-03
1.591356E+02	4.81510E+01	1.4517E-01	3.4149E-01	1.4179E-01	2.966E-01	7.791E-03
1.701159E+02	4.81376E+01	1.2798E-01	2.8164E-01	1.3619E-01	2.446E-01	7.288E-03
1.818539E+02	4.81252E+01	1.1284E-01	2.3229E-01	1.3099E-01	2.017E-01	6.818E-03
1.944018E+02	4.81138E+01	9.9495E-02	1.9159E-01	1.2614E-01	1.663E-01	6.378E-03
2.078156E+02	4.81033E+01	8.7731E-02	1.5803E-01	1.2160E-01	1.371E-01	5.966E-03
2.221548E+02	4.80936E+01	7.7361E-02	1.3036E-01	1.1733E-01	1.130E-01	5.581E-03
2.374835E+02	4.80848E+01	6.8220E-02	1.0754E-01	1.1330E-01	9.320E-02	5.221E-03
2.538699E+02	4.80767E+01	6.0162E-02	8.8712E-02	1.0947E-01	7.685E-02	4.884E-03
2.713869E+02	4.80694E+01	5.3057E-02	7.3187E-02	1.0583E-01	6.336E-02	4.569E-03
2.901126E+02	4.80627E+01	4.6794E-02	6.0380E-02	1.0234E-01	5.224E-02	4.274E-03
3.101304E+02	4.80566E+01	4.1271E-02	4.9817E-02	9.8999E-02	4.308E-02	3.998E-03
3.315294E+02	4.80510E+01	3.6402E-02	4.1103E-02	9.5780E-02	3.552E-02	3.740E-03
3.544049E+02	4.80460E+01	3.2108E-02	3.3914E-02	9.2673E-02	2.929E-02	3.498E-03
3.788588E+02	4.80414E+01	2.8321E-02	2.7984E-02	8.9665E-02	2.415E-02	3.273E-03
4.050001E+02	4.80373E+01	2.4982E-02	2.3092E-02	8.6747E-02	1.991E-02	3.061E-03
4.329451E+02	4.80335E+01	2.2038E-02	1.9055E-02	8.3910E-02	1.642E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 359

In Z = 49

Atomic weight = 1.148200E+02 g/mol, nominal density ρ (g/cm³) = 7.3000E+00

μ_a (barns/atom) = μ (cm²/g) \times 1.90663E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.66489E+05

14 edges. Edge energies (keV):

K		2.79399E+00	L	I	4.23750E+00	L	II	3.93800E+00	L	III	3.73010E+00
M	I	8.25600E-00	M	II	7.02200E-00	M	III	6.64300E-00	M	IV	4.50800E-01
M	V	4.43100E-00	N	I	1.21900E-00	N	II	7.74000E-02	N	III	7.74000E-02
N	IV	6.2000E-02	N	V	1.62000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -5.0495E-01, -3.1260E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.1471E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_x cm ² /g	λ nm
1.069000E-02	2.10675E+00	0.0000E+00	0.0000E+00	7.9937E-05	0.000E+00	1.160E+02
1.142761E-02	1.92675E+00	0.0000E+00	0.0000E+00	1.1129E-04	0.000E+00	1.085E+02
1.221612E-02	1.70380E+00	0.0000E+00	0.0000E+00	1.5407E-04	0.000E+00	1.015E+02
1.305903E-02	1.41977E+00	0.0000E+00	0.0000E+00	2.1209E-04	0.000E+00	9.494E+01
1.396010E-02	1.03965E+00	0.0000E+00	0.0000E+00	2.9032E-04	0.000E+00	8.881E+01
1.492335E-02	4.73339E-01	0.0000E+00	0.0000E+00	3.9521E-04	0.000E+00	8.308E+01
1.587600E-02	-6.44411E-01	0.0000E+00	0.0000E+00	5.2349E-04	0.000E+00	7.810E+01
1.595306E-02	-8.37616E-01	0.0000E+00	0.0000E+00	5.3503E-04	0.000E+00	7.772E+01
1.611900E-02	-1.58291E+00	0.0000E+00	0.0000E+00	5.6048E-04	0.000E+00	7.692E+01
1.618380E-02	-2.59561E+00	0.0000E+00	0.0000E+00	5.7065E-04	0.000E+00	7.661E+01
1.628100E-02	-1.65847E+00	1.9310E+00	4.3466E+04	5.8616E-04	0.000E+00	7.615E+01
1.652400E-02	-9.06518E-01	1.9665E+00	4.3615E+04	6.2623E-04	0.000E+00	7.503E+01
1.705382E-02	-5.03092E-01	2.0444E+00	4.3934E+04	7.2033E-04	0.000E+00	7.270E+01
1.823053E-02	-4.08900E-01	2.2269E+00	4.4767E+04	9.6452E-04	0.000E+00	6.801E+01
1.948844E-02	-6.32308E-01	2.5294E+00	4.7567E+04	1.2845E-03	0.000E+00	6.362E+01
2.083314E-02	-9.68126E-01	2.9881E+00	5.2566E+04	1.7014E-03	0.000E+00	5.951E+01
2.227063E-02	-1.34282E+00	3.6169E+00	5.9521E+04	2.2416E-03	0.000E+00	5.567E+01
2.380730E-02	-1.70181E+00	4.4309E+00	6.8209E+04	2.9377E-03	0.000E+00	5.208E+01
2.545001E-02	-1.98858E+00	5.4388E+00	7.8321E+04	3.8295E-03	0.000E+00	4.872E+01
2.720606E-02	-2.14107E+00	6.6361E+00	8.9394E+04	4.9658E-03	0.000E+00	4.557E+01
2.908327E-02	-2.09479E+00	7.9989E+00	1.0080E+05	6.4058E-03	0.000E+00	4.263E+01
3.109002E-02	-1.79013E+00	9.4806E+00	1.1176E+05	8.2207E-03	0.000E+00	3.988E+01
3.323523E-02	-1.18182E+00	1.1013E+01	1.2144E+05	1.0495E-02	0.000E+00	3.731E+01
3.552846E-02	-2.47938E-01	1.2510E+01	1.2904E+05	1.3331E-02	0.000E+00	3.490E+01
3.797993E-02	1.00374E+01	1.3880E+01	1.3394E+05	1.6847E-02	0.000E+00	3.264E+01
4.060054E-02	2.53426E+00	1.5036E+01	1.3573E+05	2.1183E-02	0.000E+00	3.054E+01
4.340198E-02	4.27733E+00	1.5908E+01	1.3433E+05	2.6502E-02	0.000E+00	2.857E+01
4.639671E-02	6.14773E+00	1.6450E+01	1.2994E+05	3.2991E-02	0.000E+00	2.672E+01
4.959809E-02	8.01761E+00	1.6647E+01	1.2301E+05	4.0867E-02	0.000E+00	2.500E+01
5.302035E-02	9.86577E+00	1.6513E+01	1.1414E+05	5.0375E-02	0.000E+00	2.338E+01
5.667876E-02	1.15783E+01	1.6084E+01	1.0400E+05	6.1793E-02	0.000E+00	2.187E+01
6.058959E-02	1.30912E+01	1.5414E+01	9.3237E+04	7.5432E-02	0.000E+00	2.046E+01
6.477028E-02	1.43529E+01	1.4565E+01	8.2413E+04	9.1640E-02	0.000E+00	1.914E+01
6.923942E-02	1.53047E+01	1.3597E+01	7.1968E+04	1.1080E-01	0.000E+00	1.791E+01
7.401695E-02	1.57640E+01	1.2568E+01	6.2231E+04	1.3333E-01	0.000E+00	1.675E+01
7.85200E-02	1.55786E+01	1.2186E+01	5.8880E+04	1.4254E-01	0.000E+00	1.635E+01
7.701300E-02	1.48156E+01	1.1950E+01	5.6867E+04	1.4852E-01	0.000E+00	1.610E+01
7.732260E-02	1.37034E+01	1.1888E+01	5.6344E+04	1.5013E-01	0.000E+00	1.603E+01
7.78700E-02	1.50356E+01	1.4087E+01	6.6368E+04	1.5257E-01	0.000E+00	1.594E+01
7.894800E-02	1.62911E+01	1.3725E+01	6.3716E+04	1.5875E-01	0.000E+00	1.570E+01
7.912411E-02	1.64066E+01	1.3672E+01	6.3326E+04	1.5970E-01	0.000E+00	1.567E+01
8.458368E-02	1.80342E+01	1.2163E+01	5.2700E+04	1.9038E-01	0.000E+00	1.466E+01
9.041995E-02	1.86695E+01	1.0863E+01	4.4030E+04	2.2591E-01	0.000E+00	1.371E+01
9.665893E-02	1.89771E+01	9.7759E+00	3.7066E+04	2.6683E-01	0.000E+00	1.283E+01
1.033284E-01	1.91093E+01	8.8509E+00	3.1393E+04	3.1374E-01	0.000E+00	1.200E+01
1.104581E-01	1.91198E+01	8.0593E+00	2.6740E+04	3.6723E-01	0.000E+00	1.122E+01
1.180797E-01	1.90030E+01	7.3815E+00	2.2910E+04	4.2790E-01	0.000E+00	1.050E+01
1.194620E-01	1.89541E+01	7.2738E+00	2.2315E+04	4.3927E-01	0.000E+00	1.038E+01
1.212905E-01	1.88183E+01	7.1376E+00	2.1567E+04	4.5446E-01	0.000E+00	1.022E+01
1.217781E-01	1.86749E+01	7.1024E+00	2.1375E+04	4.5855E-01	0.000E+00	1.018E+01
1.225095E-01	1.88039E+01	7.3213E+00	2.1902E+04	4.6469E-01	0.000E+00	1.012E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.243380E-01	1.89026E+01	7.2014E+00	2.1226E+04	4.8019E-01	0.000E+00	9.972E+00
1.262272E-01	1.89310E+01	7.0840E+00	2.0568E+04	4.9638E-01	0.000E+00	9.822E+00
1.349368E-01	1.89234E+01	6.6167E+00	1.7971E+04	5.7327E-01	0.000E+00	9.188E+00
1.442475E-01	1.88536E+01	6.2239E+00	1.5813E+04	6.5917E-01	0.000E+00	8.595E+00
1.542005E-01	1.87580E+01	5.8934E+00	1.4007E+04	7.5465E-01	0.000E+00	8.040E+00
1.648404E-01	1.86457E+01	5.6158E+00	1.2486E+04	8.6022E-01	0.000E+00	7.521E+00
1.762144E-01	1.85194E+01	5.3826E+00	1.1195E+04	9.7637E-01	0.000E+00	7.036E+00
1.883732E-01	1.83786E+01	5.1860E+00	1.0090E+04	1.1035E+00	0.000E+00	6.582E+00
2.013709E-01	1.82195E+01	5.0191E+00	9.1347E+03	1.2419E+00	0.000E+00	6.157E+00
2.152655E-01	1.80359E+01	4.8758E+00	8.3010E+03	1.3919E+00	0.000E+00	5.760E+00
2.301188E-01	1.78183E+01	4.7503E+00	7.5654E+03	1.5535E+00	0.000E+00	5.388E+00
2.459970E-01	1.75604E+01	4.6379E+00	6.9096E+03	1.7267E+00	0.000E+00	5.040E+00
2.629708E-01	1.72294E+01	4.5342E+00	6.3191E+03	1.9114E+00	0.000E+00	4.715E+00
2.811158E-01	1.68057E+01	4.4356E+00	5.7827E+03	2.1074E+00	0.000E+00	4.410E+00
3.005128E-01	1.62501E+01	4.3391E+00	5.2917E+03	2.3141E+00	0.000E+00	4.126E+00
3.212482E-01	1.55051E+01	4.2591E+00	4.8589E+03	2.5310E+00	0.000E+00	3.859E+00
3.434143E-01	1.44769E+01	4.1793E+00	4.4601E+03	2.7574E+00	0.000E+00	3.610E+00
3.671099E-01	1.29744E+01	4.0943E+00	4.0874E+03	2.9923E+00	0.000E+00	3.377E+00
3.924405E-01	1.05627E+01	4.0036E+00	3.7389E+03	3.2346E+00	0.000E+00	3.159E+00
4.195189E-01	5.77615E+00	3.9067E+00	3.4129E+03	3.4832E+00	0.000E+00	2.955E+00
4.342380E-01	-2.31978E-01	3.8542E+00	3.2529E+03	3.6136E+00	0.000E+00	2.855E+00
4.408845E-01	-7.80538E+00	3.8306E+00	3.1842E+03	3.6715E+00	0.000E+00	2.812E+00
4.417840E-01	-1.03777E+01	3.8274E+00	3.1751E+03	3.6792E+00	0.000E+00	2.806E+00
4.426569E-01	-1.54694E+01	3.8243E+00	3.1662E+03	3.6868E+00	0.000E+00	2.801E+00
4.453155E-01	-9.57113E+00	1.7656E+01	1.4531E+04	3.7097E+00	0.000E+00	2.784E+00
4.484657E-01	-8.22734E+00	1.7680E+01	1.4448E+04	3.7366E+00	0.000E+00	2.765E+00
4.485460E-01	-8.26674E+00	1.7681E+01	1.4446E+04	3.7373E+00	0.000E+00	2.764E+00
4.503492E-01	-1.18403E+01	1.7695E+01	1.4400E+04	3.7527E+00	0.000E+00	2.753E+00
4.519620E-01	-8.09054E+00	2.7173E+01	2.2034E+04	3.7664E+00	0.000E+00	2.743E+00
4.530540E-01	-5.57207E+00	2.7187E+01	2.1992E+04	3.7756E+00	0.000E+00	2.737E+00
4.598160E-01	9.83374E-01	2.7272E+01	2.1736E+04	3.8325E+00	0.000E+00	2.696E+00
4.794098E-01	8.30071E+00	2.7512E+01	2.1032E+04	3.9934E+00	0.000E+00	2.586E+00
5.124891E-01	1.46157E+01	2.7734E+01	1.9833E+04	4.2519E+00	0.000E+00	2.419E+00
5.478508E-01	1.91024E+01	2.7329E+01	1.8282E+04	4.5105E+00	0.000E+00	2.263E+00
5.856525E-01	2.24492E+01	2.6443E+01	1.6548E+04	4.7672E+00	0.000E+00	2.117E+00
6.260625E-01	2.46655E+01	2.5263E+01	1.4788E+04	5.0203E+00	0.000E+00	1.980E+00
6.510140E-01	2.49558E+01	2.4496E+01	1.3790E+04	5.1661E+00	0.000E+00	1.904E+00
6.609785E-01	2.39656E+01	2.4189E+01	1.3412E+04	5.2222E+00	0.000E+00	1.876E+00
6.636357E-01	2.23863E+01	2.4108E+01	1.3314E+04	5.2370E+00	0.000E+00	1.868E+00
6.676215E-01	2.42457E+01	2.7294E+01	1.4983E+04	5.2589E+00	0.000E+00	1.857E+00
6.692609E-01	2.47328E+01	2.7245E+01	1.4919E+04	5.2679E+00	0.000E+00	1.853E+00
6.775860E-01	2.60673E+01	2.6995E+01	1.4601E+04	5.3130E+00	0.000E+00	1.830E+00
6.881560E-01	2.69478E+01	2.6681E+01	1.4210E+04	5.3691E+00	0.000E+00	1.802E+00
6.986890E-01	2.71941E+01	2.6373E+01	1.3834E+04	5.4238E+00	0.000E+00	1.775E+00
7.014978E-01	2.66741E+01	2.6292E+01	1.3736E+04	5.4381E+00	0.000E+00	1.767E+00
7.057110E-01	2.77002E+01	2.7594E+01	1.4330E+04	5.4595E+00	0.000E+00	1.757E+00
7.154399E-01	2.89399E+01	2.7322E+01	1.3996E+04	5.5080E+00	0.000E+00	1.733E+00
7.162440E-01	2.90168E+01	2.7300E+01	1.3969E+04	5.5120E+00	0.000E+00	1.731E+00
7.648052E-01	3.22695E+01	2.5935E+01	1.2428E+04	5.7389E+00	0.000E+00	1.621E+00
8.090880E-01	3.39638E+01	2.4513E+01	1.1104E+04	5.9250E+00	0.000E+00	1.532E+00
8.175768E-01	3.40589E+01	2.4251E+01	1.0871E+04	5.9585E+00	0.000E+00	1.516E+00
8.214720E-01	3.39818E+01	2.4132E+01	1.0766E+04	5.9737E+00	0.000E+00	1.509E+00
8.247744E-01	3.35525E+01	2.4032E+01	1.0679E+04	5.9865E+00	0.000E+00	1.503E+00
8.297280E-01	3.42947E+01	2.4967E+01	1.1028E+04	6.0054E+00	0.000E+00	1.494E+00
8.421120E-01	3.52159E+01	2.4598E+01	1.0705E+04	6.0518E+00	0.000E+00	1.472E+00
8.739896E-01	3.66029E+01	2.3685E+01	9.9319E+03	6.1652E+00	0.000E+00	1.419E+00
9.342948E-01	3.84530E+01	2.2110E+01	8.6727E+03	6.3574E+00	0.000E+00	1.327E+00
9.987612E-01	4.00262E+01	2.0631E+01	7.5704E+03	6.5333E+00	0.000E+00	1.241E+00
1.067676E+00	4.13313E+01	1.8950E+01	6.5046E+03	6.6917E+00	0.000E+00	1.161E+00
1.141345E+00	4.22130E+01	1.7387E+01	5.5829E+03	6.8312E+00	0.000E+00	1.086E+00
1.220098E+00	4.28776E+01	1.5906E+01	4.7779E+03	6.9508E+00	0.000E+00	1.016E+00
1.304285E+00	4.33582E+01	1.4538E+01	4.0849E+03	7.0495E+00	0.000E+00	9.506E-01
1.394281E+00	4.37113E+01	1.3290E+01	3.4933E+03	7.1268E+00	0.000E+00	8.892E-01
1.490486E+00	4.39566E+01	1.2140E+01	2.9850E+03	7.1821E+00	0.000E+00	8.318E-01
1.593329E+00	4.41135E+01	1.1086E+01	2.5500E+03	7.2152E+00	0.000E+00	7.781E-01

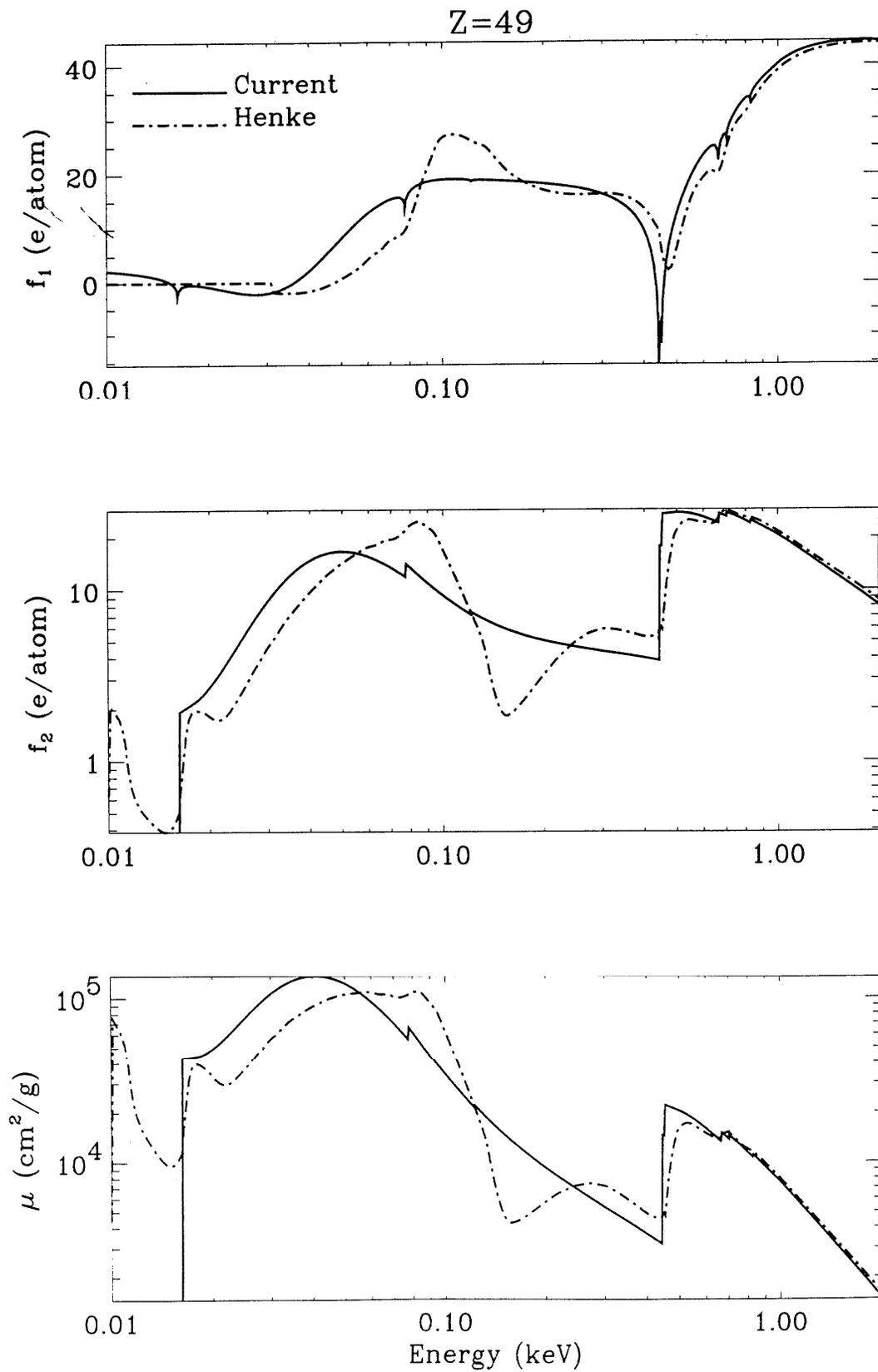
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 361

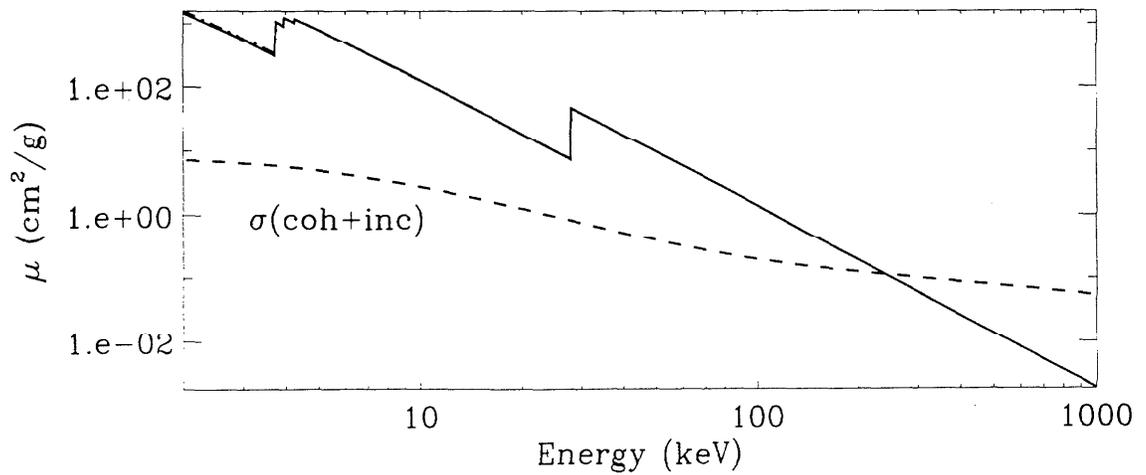
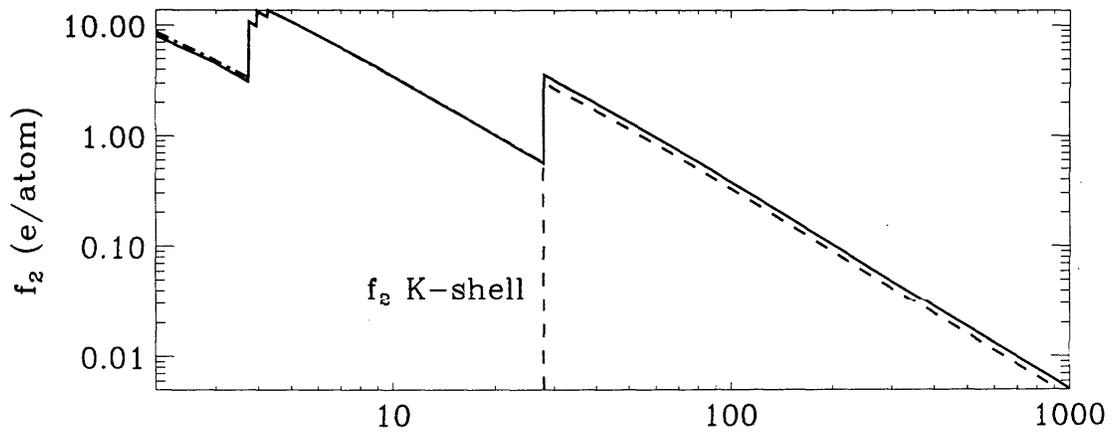
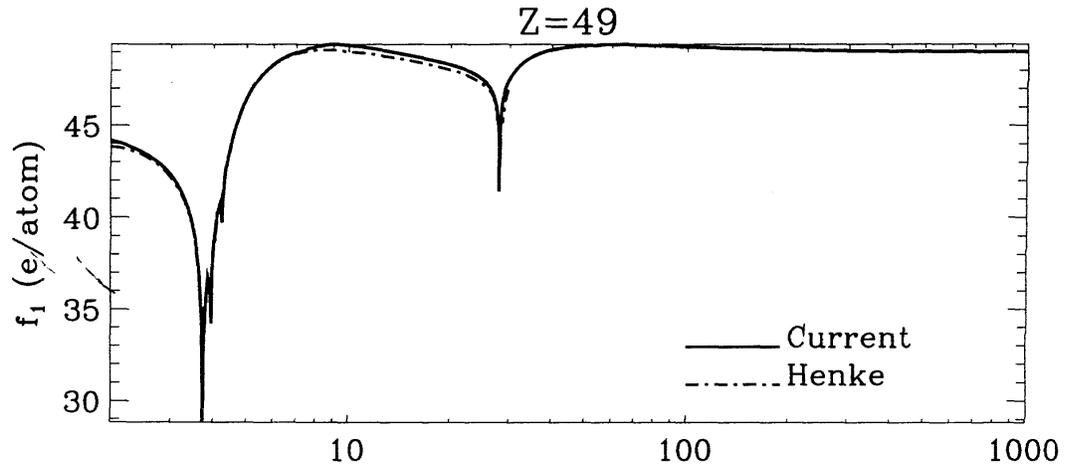
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
1.703269E+00	4.42037E+01	1.0130E+01	2.1796E+03	7.2259E+00	0.000E+00	7.279E-01
1.820795E+00	4.42438E+01	9.2342E+00	1.8587E+03	7.2145E+00	0.000E+00	6.809E-01
1.946430E+00	4.41999E+01	8.3710E+00	1.5762E+03	7.1814E+00	0.000E+00	6.370E-01
2.080733E+00	4.40835E+01	7.6005E+00	1.3387E+03	7.1271E+00	0.000E+00	5.959E-01
2.224304E+00	4.39110E+01	6.9120E+00	1.1389E+03	7.0522E+00	0.000E+00	5.574E-01
2.377781E+00	4.36841E+01	6.2955E+00	9.7033E+02	6.9579E+00	0.000E+00	5.214E-01
2.541848E+00	4.34025E+01	5.7429E+00	8.2802E+02	6.8450E+00	0.000E+00	4.878E-01
2.717235E+00	4.30533E+01	5.2385E+00	7.0654E+02	6.7149E+00	0.000E+00	4.563E-01
2.904724E+00	4.26007E+01	4.7633E+00	6.0098E+02	6.5687E+00	0.000E+00	4.268E-01
3.105150E+00	4.19395E+01	4.2790E+00	5.0504E+02	6.4080E+00	0.000E+00	3.993E-01
3.319406E+00	4.08316E+01	3.8064E+00	4.2025E+02	6.2341E+00	0.000E+00	3.735E-01
3.548445E+00	3.86509E+01	3.3869E+00	3.4981E+02	6.0487E+00	0.000E+00	3.494E-01
3.655498E+00	3.63248E+01	3.2169E+00	3.2252E+02	5.9628E+00	0.000E+00	3.392E-01
3.711449E+00	3.28236E+01	3.1337E+00	3.0944E+02	5.9182E+00	0.000E+00	3.341E-01
3.726370E+00	2.88247E+01	3.1121E+00	3.0608E+02	5.9063E+00	0.000E+00	3.327E-01
3.748750E+00	3.27064E+01	1.0810E+01	1.0568E+03	5.8885E+00	0.000E+00	3.307E-01
3.793288E+00	3.55740E+01	1.0551E+01	1.0194E+03	5.8533E+00	0.000E+00	3.269E-01
3.804702E+00	3.59170E+01	1.0487E+01	1.0101E+03	5.8443E+00	0.000E+00	3.259E-01
3.859240E+00	3.67476E+01	1.0186E+01	9.6728E+02	5.8014E+00	0.000E+00	3.213E-01
3.918310E+00	3.60579E+01	9.8767E+00	9.2379E+02	5.7552E+00	0.000E+00	3.164E-01
3.934062E+00	3.43002E+01	9.8038E+00	9.1330E+02	5.7429E+00	0.000E+00	3.152E-01
3.957690E+00	3.65333E+01	1.3528E+01	1.2528E+03	5.7245E+00	0.000E+00	3.133E-01
4.016760E+00	3.88109E+01	1.3157E+01	1.2004E+03	5.6788E+00	0.000E+00	3.087E-01
4.055024E+00	3.95586E+01	1.2926E+01	1.1683E+03	5.6494E+00	0.000E+00	3.058E-01
4.152750E+00	4.06024E+01	1.2377E+01	1.0923E+03	5.5749E+00	0.000E+00	2.986E-01
4.216313E+00	4.04916E+01	1.2056E+01	1.0479E+03	5.5269E+00	0.000E+00	2.941E-01
4.233263E+00	3.97108E+01	1.1973E+01	1.0366E+03	5.5142E+00	0.000E+00	2.929E-01
4.258688E+00	4.08706E+01	1.3698E+01	1.1788E+03	5.4952E+00	0.000E+00	2.911E-01
4.322250E+00	4.22127E+01	1.3387E+01	1.1351E+03	5.4479E+00	0.000E+00	2.869E-01
4.334821E+00	4.23881E+01	1.3327E+01	1.1267E+03	5.4386E+00	0.000E+00	2.860E-01
4.633924E+00	4.48579E+01	1.2054E+01	9.5336E+02	5.2225E+00	0.000E+00	2.676E-01
4.953664E+00	4.62849E+01	1.0916E+01	8.0757E+02	5.0025E+00	0.000E+00	2.503E-01
5.295467E+00	4.72544E+01	9.8417E+00	6.8112E+02	4.7801E+00	0.000E+00	2.341E-01
5.660855E+00	4.79270E+01	8.8515E+00	5.7305E+02	4.5567E+00	0.000E+00	2.190E-01
6.051453E+00	4.83927E+01	7.9492E+00	4.8142E+02	4.3335E+00	0.000E+00	2.049E-01
6.469004E+00	4.87137E+01	7.1376E+00	4.0437E+02	4.1118E+00	0.000E+00	1.917E-01
6.915365E+00	4.89322E+01	6.4106E+00	3.3974E+02	3.8926E+00	0.000E+00	1.793E-01
7.392525E+00	4.90788E+01	5.7615E+00	2.8563E+02	3.6770E+00	0.000E+00	1.677E-01
7.902609E+00	4.92898E+01	5.1709E+00	2.3980E+02	3.4659E+00	0.000E+00	1.569E-01
8.447890E+00	4.93396E+01	4.6378E+00	2.0120E+02	3.2602E+00	0.000E+00	1.468E-01
9.030794E+00	4.94159E+01	4.1462E+00	1.6826E+02	3.0604E+00	0.000E+00	1.373E-01
9.653919E+00	4.93952E+01	3.6763E+00	1.3956E+02	2.8671E+00	0.000E+00	1.284E-01
1.032004E+01	4.93405E+01	3.2627E+00	1.1587E+02	2.6810E+00	0.000E+00	1.201E-01
1.103212E+01	4.92665E+01	2.8984E+00	9.6285E+01	2.5024E+00	0.000E+00	1.124E-01
1.179334E+01	4.91806E+01	2.5771E+00	8.0086E+01	2.3315E+00	0.000E+00	1.051E-01
1.260708E+01	4.90870E+01	2.2933E+00	6.6667E+01	2.1686E+00	0.000E+00	9.834E-02
1.347697E+01	4.89881E+01	2.0411E+00	5.5505E+01	2.0139E+00	0.000E+00	9.200E-02
1.440688E+01	4.88850E+01	1.8179E+00	4.6244E+01	1.8673E+00	0.000E+00	8.606E-02
1.540095E+01	4.87786E+01	1.6207E+00	3.8567E+01	1.7289E+00	0.000E+00	8.050E-02
1.646362E+01	4.86691E+01	1.4441E+00	3.2147E+01	1.5987E+00	0.000E+00	7.531E-02
1.759961E+01	4.85527E+01	1.2838E+00	2.6734E+01	1.4764E+00	0.000E+00	7.045E-02
1.881398E+01	4.84256E+01	1.1395E+00	2.2197E+01	1.3620E+00	0.000E+00	6.590E-02
2.011215E+01	4.82806E+01	1.0092E+00	1.8389E+01	1.2552E+00	0.000E+00	6.165E-02
2.149988E+01	4.81090E+01	8.9450E-01	1.5248E+01	1.1557E+00	0.000E+00	5.767E-02
2.298338E+01	4.78919E+01	7.9358E-01	1.2654E+01	1.0634E+00	0.000E+00	5.395E-02
2.456923E+01	4.75830E+01	7.0468E-01	1.0511E+01	9.7783E-01	0.000E+00	5.046E-02
2.626450E+01	4.70178E+01	6.2629E-01	8.7392E+00	8.9877E-01	0.000E+00	4.721E-02
2.738110E+01	4.60767E+01	5.7897E-01	7.7493E+00	8.5258E-01	0.000E+00	4.528E-02
2.780020E+01	4.48110E+01	5.6192E-01	7.4078E+00	8.3631E-01	0.000E+00	4.460E-02
2.791196E+01	4.32899E+01	5.5751E-01	7.3202E+00	8.3206E-01	0.000E+00	4.442E-02
2.807676E+01	4.48120E+01	3.5483E+00	4.6316E+01	8.2587E-01	3.912E+01	4.416E-02
2.807960E+01	4.48324E+01	3.5477E+00	4.6303E+01	8.2576E-01	3.911E+01	4.415E-02
2.849870E+01	4.62279E+01	3.4601E+00	4.4496E+01	8.1038E-01	3.761E+01	4.351E-02
3.001405E+01	4.75892E+01	3.1720E+00	3.8732E+01	7.5880E-01	3.283E+01	4.131E-02
3.208502E+01	4.82836E+01	2.8394E+00	3.2433E+01	6.9724E-01	2.758E+01	3.864E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
3.429889E+01	4.86701E+01	2.5429E+00	2.7171E+01	6.4083E-01	2.318E+01	3.615E-02
3.666551E+01	4.89207E+01	2.2763E+00	2.2753E+01	5.8925E-01	1.947E+01	3.381E-02
3.919543E+01	4.90881E+01	2.0305E+00	1.8985E+01	5.4217E-01	1.628E+01	3.163E-02
4.189992E+01	4.92000E+01	1.8103E+00	1.5834E+01	4.9928E-01	1.361E+01	2.959E-02
4.479101E+01	4.92746E+01	1.6133E+00	1.3200E+01	4.6026E-01	1.136E+01	2.768E-02
4.788159E+01	4.93230E+01	1.4372E+00	1.1001E+01	4.2482E-01	9.485E+00	2.589E-02
5.118542E+01	4.93526E+01	1.2802E+00	9.1660E+00	3.9267E-01	7.914E+00	2.422E-02
5.471721E+01	4.93689E+01	1.1402E+00	7.6367E+00	3.6354E-01	6.602E+00	2.266E-02
5.849270E+01	4.94076E+01	1.0121E+00	6.3415E+00	3.3718E-01	5.486E+00	2.120E-02
6.252870E+01	4.94035E+01	8.9714E-01	5.2583E+00	3.1334E-01	4.550E+00	1.983E-02
6.684318E+01	4.93931E+01	7.9529E-01	4.3605E+00	2.9179E-01	3.774E+00	1.855E-02
7.145536E+01	4.93788E+01	7.0507E-01	3.6163E+00	2.7233E-01	3.131E+00	1.735E-02
7.638578E+01	4.93619E+01	6.2514E-01	2.9936E+00	2.5476E-01	2.597E+00	1.623E-02
8.165640E+01	4.93449E+01	5.5344E-01	2.4839E+00	2.3889E-01	2.151E+00	1.518E-02
8.729069E+01	4.93260E+01	4.8826E-01	2.0500E+00	2.2455E-01	1.776E+00	1.420E-02
9.331374E+01	4.93055E+01	4.3080E-01	1.6920E+00	2.1158E-01	1.466E+00	1.329E-02
9.975239E+01	4.92849E+01	3.8012E-01	1.3966E+00	1.9985E-01	1.211E+00	1.243E-02
1.066353E+02	4.92645E+01	3.3543E-01	1.1528E+00	1.8921E-01	9.998E-01	1.163E-02
1.139931E+02	4.92447E+01	2.9601E-01	9.5167E-01	1.7956E-01	8.256E-01	1.088E-02
1.218587E+02	4.92257E+01	2.6122E-01	7.8562E-01	1.7079E-01	6.816E-01	1.017E-02
1.302669E+02	4.92077E+01	2.3040E-01	6.4820E-01	1.6278E-01	5.624E-01	9.518E-03
1.392553E+02	4.91906E+01	2.0323E-01	5.3485E-01	1.5547E-01	4.640E-01	8.903E-03
1.488640E+02	4.91745E+01	1.7927E-01	4.4135E-01	1.4876E-01	3.829E-01	8.329E-03
1.591356E+02	4.91595E+01	1.5814E-01	3.6421E-01	1.4258E-01	3.159E-01	7.791E-03
1.701159E+02	4.91456E+01	1.3952E-01	3.0057E-01	1.3687E-01	2.607E-01	7.288E-03
1.818539E+02	4.91326E+01	1.2309E-01	2.4806E-01	1.3158E-01	2.151E-01	6.818E-03
1.944018E+02	4.91206E+01	1.0860E-01	2.0473E-01	1.2665E-01	1.775E-01	6.378E-03
2.078156E+02	4.91096E+01	9.5820E-02	1.6898E-01	1.2204E-01	1.464E-01	5.966E-03
2.221548E+02	4.90995E+01	8.4549E-02	1.3948E-01	1.1771E-01	1.208E-01	5.581E-03
2.374835E+02	4.90902E+01	7.4607E-02	1.1514E-01	1.1363E-01	9.968E-02	5.221E-03
2.538699E+02	4.90817E+01	6.5837E-02	9.5043E-02	1.0976E-01	8.224E-02	4.884E-03
2.713869E+02	4.90739E+01	5.8100E-02	7.8460E-02	1.0607E-01	6.786E-02	4.569E-03
2.901126E+02	4.90668E+01	5.1275E-02	6.4773E-02	1.0255E-01	5.599E-02	4.274E-03
3.101304E+02	4.90603E+01	4.5253E-02	5.3476E-02	9.9183E-02	4.620E-02	3.998E-03
3.315294E+02	4.90545E+01	3.9939E-02	4.4151E-02	9.5940E-02	3.812E-02	3.740E-03
3.544049E+02	4.90491E+01	3.5251E-02	3.6453E-02	9.2812E-02	3.145E-02	3.498E-03
3.788588E+02	4.90443E+01	3.1115E-02	3.0099E-02	8.9786E-02	2.595E-02	3.273E-03
4.050001E+02	4.90399E+01	2.7464E-02	2.4853E-02	8.6852E-02	2.141E-02	3.061E-03
4.329451E+02	4.90359E+01	2.4243E-02	2.0522E-02	8.4002E-02	1.767E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 365

Sn Z = 50

Atomic weight = 1.186900E+02 g/mol, nominal density ρ (g/cm³) = 7.3000E+00

μ_0 (barns/atom) = μ (cm²/g) \times 1.97090E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.54540E+05

4 edges. Edge energies (keV):

K		2.92001E+00	L	I	4.46470E+00	L	II	4.15610E+00	L	III	3.92880E+00
M	I	8.83800E-00	M	II	7.56400E-00	M	III	7.14400E-00	M	IV	4.93300E-01
N	V	4.84800E-00	N	I	1.36500E-00	N	II	8.86000E-02	N	III	8.86000E-02
		2.39000E-02		V	2.39000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -5.3125E-01, -3.2820E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.1555E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	8.40533E+00	0.0000E+00	0.0000E+00	7.9989E-05	0.000E+00	1.160E+02
1.142761E-02	8.31660E+00	0.0000E+00	0.0000E+00	1.1133E-04	0.000E+00	1.085E+02
1.221612E-02	8.21206E+00	0.0000E+00	0.0000E+00	1.5407E-04	0.000E+00	1.015E+02
1.305903E-02	8.08822E+00	0.0000E+00	0.0000E+00	2.1202E-04	0.000E+00	9.494E+01
1.396010E-02	7.94054E+00	0.0000E+00	0.0000E+00	2.9014E-04	0.000E+00	8.881E+01
1.492335E-02	7.76297E+00	0.0000E+00	0.0000E+00	3.9485E-04	0.000E+00	8.308E+01
1.595306E-02	7.54725E+00	0.0000E+00	0.0000E+00	5.3439E-04	0.000E+00	7.772E+01
1.705382E-02	7.28160E+00	0.0000E+00	0.0000E+00	7.1929E-04	0.000E+00	7.270E+01
1.823053E-02	6.94848E+00	0.0000E+00	0.0000E+00	9.6289E-04	0.000E+00	6.801E+01
1.948844E-02	6.51984E+00	0.0000E+00	0.0000E+00	1.2820E-03	0.000E+00	6.362E+01
2.083314E-02	5.94558E+00	0.0000E+00	0.0000E+00	1.6978E-03	0.000E+00	5.951E+01
2.227063E-02	5.11472E+00	0.0000E+00	0.0000E+00	2.2363E-03	0.000E+00	5.567E+01
2.342200E-02	4.07447E+00	0.0000E+00	0.0000E+00	2.7441E-03	0.000E+00	5.293E+01
2.378050E-02	3.44880E+00	0.0000E+00	0.0000E+00	2.9169E-03	0.000E+00	5.214E+01
2.380730E-02	3.36580E+00	0.0000E+00	0.0000E+00	2.9301E-03	0.000E+00	5.208E+01
2.387610E-02	2.99671E+00	0.0000E+00	0.0000E+00	2.9642E-03	0.000E+00	5.193E+01
2.401950E-02	3.16193E+00	7.1303E-01	1.0525E+04	3.0361E-03	0.000E+00	5.162E+01
2.437800E-02	3.07327E+00	8.6220E-01	1.2539E+04	3.2210E-03	0.000E+00	5.086E+01
2.545001E-02	2.19506E+00	1.4971E+00	2.0856E+04	3.8189E-03	0.000E+00	4.872E+01
2.720606E-02	6.54972E-01	3.4165E+00	4.4523E+04	4.9513E-03	0.000E+00	4.557E+01
2.908327E-02	-1.53839E-01	6.3990E+00	7.8007E+04	6.3861E-03	0.000E+00	4.263E+01
3.109002E-02	3.64264E-01	9.9099E+00	1.1301E+05	8.1940E-03	0.000E+00	3.988E+01
3.323523E-02	2.36543E+00	1.3138E+01	1.4015E+05	1.0460E-02	0.000E+00	3.731E+01
3.552846E-02	5.47285E+00	1.5366E+01	1.5334E+05	1.3284E-02	0.000E+00	3.490E+01
3.797993E-02	9.01769E+00	1.6277E+01	1.5194E+05	1.6786E-02	0.000E+00	3.264E+01
4.060054E-02	1.23644E+01	1.5966E+01	1.3942E+05	2.1104E-02	0.000E+00	3.054E+01
4.340198E-02	1.51082E+01	1.4784E+01	1.2077E+05	2.6400E-02	0.000E+00	2.857E+01
4.639671E-02	1.71028E+01	1.3132E+01	1.0035E+05	3.2862E-02	0.000E+00	2.672E+01
4.959809E-02	1.83880E+01	1.1341E+01	8.1072E+04	4.0704E-02	0.000E+00	2.500E+01
5.302035E-02	1.90958E+01	9.6305E+00	6.4398E+04	5.0170E-02	0.000E+00	2.338E+01
5.667876E-02	1.93800E+01	8.1137E+00	5.0753E+04	6.1538E-02	0.000E+00	2.187E+01
6.058959E-02	1.93766E+01	6.8318E+00	3.9976E+04	7.5117E-02	0.000E+00	2.046E+01
6.477028E-02	1.91892E+01	5.7821E+00	3.1650E+04	9.1254E-02	0.000E+00	1.914E+01
6.923942E-02	1.88876E+01	4.9401E+00	2.5296E+04	1.1033E-01	0.000E+00	1.791E+01
7.401695E-02	1.85413E+01	4.2744E+00	2.0474E+04	1.3276E-01	0.000E+00	1.675E+01
7.912411E-02	1.80845E+01	3.7535E+00	1.6819E+04	1.5901E-01	0.000E+00	1.567E+01
8.458368E-02	1.74338E+01	3.3495E+00	1.4040E+04	1.8956E-01	0.000E+00	1.466E+01
8.682800E-02	1.69441E+01	3.2177E+00	1.3139E+04	2.0284E-01	0.000E+00	1.428E+01
8.815700E-02	1.61855E+01	3.1474E+00	1.2658E+04	2.1090E-01	0.000E+00	1.406E+01
8.851140E-02	1.53182E+01	3.1295E+00	1.2536E+04	2.1307E-01	0.000E+00	1.401E+01
8.904300E-02	1.62085E+01	4.7868E+00	1.9059E+04	2.1635E-01	0.000E+00	1.392E+01
9.041995E-02	1.69648E+01	4.6507E+00	1.8236E+04	2.2494E-01	0.000E+00	1.371E+01
9.665893E-02	1.75538E+01	4.1380E+00	1.5178E+04	2.6570E-01	0.000E+00	1.283E+01
1.033284E-01	1.75484E+01	3.7616E+00	1.2907E+04	3.1242E-01	0.000E+00	1.200E+01
1.104581E-01	1.74115E+01	3.5187E+00	1.1294E+04	3.6569E-01	0.000E+00	1.122E+01
1.180797E-01	1.72315E+01	3.3688E+00	1.0115E+04	4.2612E-01	0.000E+00	1.050E+01
1.262272E-01	1.70235E+01	3.2869E+00	9.2321E+03	4.9434E-01	0.000E+00	9.822E+00
1.337700E-01	1.67668E+01	3.2580E+00	8.6348E+03	5.6048E-01	0.000E+00	9.268E+00
1.349368E-01	1.66942E+01	3.2565E+00	8.5562E+03	5.7095E-01	0.000E+00	9.188E+00
1.358175E-01	1.66008E+01	3.2558E+00	8.4990E+03	5.7889E-01	0.000E+00	9.129E+00
1.363635E-01	1.64394E+01	3.2556E+00	8.4644E+03	5.8383E-01	0.000E+00	9.092E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.371825E-01	1.65757E+01	3.5528E+00	9.1820E+03	5.9127E-01	0.000E+00	9.038E+00
1.392300E-01	1.66725E+01	3.5593E+00	9.0635E+03	6.0998E-01	0.000E+00	8.905E+00
1.442475E-01	1.66976E+01	3.5821E+00	8.8042E+03	6.5655E-01	0.000E+00	8.595E+00
1.542005E-01	1.66565E+01	3.6492E+00	8.3903E+03	7.5170E-01	0.000E+00	8.040E+00
1.648404E-01	1.66020E+01	3.7388E+00	8.0413E+03	8.5693E-01	0.000E+00	7.521E+00
1.762144E-01	1.65491E+01	3.8437E+00	7.7333E+03	9.7272E-01	0.000E+00	7.036E+00
1.883732E-01	1.64986E+01	3.9584E+00	7.4501E+03	1.0995E+00	0.000E+00	6.582E+00
2.013709E-01	1.64471E+01	4.0778E+00	7.1795E+03	1.2375E+00	0.000E+00	6.157E+00
2.152655E-01	1.63884E+01	4.1973E+00	6.9129E+03	1.3871E+00	0.000E+00	5.760E+00
2.301188E-01	1.63138E+01	4.3123E+00	6.6439E+03	1.5483E+00	0.000E+00	5.388E+00
2.459970E-01	1.62115E+01	4.4188E+00	6.3686E+03	1.7212E+00	0.000E+00	5.040E+00
2.629708E-01	1.60658E+01	4.5133E+00	6.0848E+03	1.9056E+00	0.000E+00	4.715E+00
2.811158E-01	1.58589E+01	4.5924E+00	5.7919E+03	2.1012E+00	0.000E+00	4.410E+00
3.005128E-01	1.55550E+01	4.6539E+00	5.4906E+03	2.3077E+00	0.000E+00	4.126E+00
3.212482E-01	1.51156E+01	4.6958E+00	5.1824E+03	2.5243E+00	0.000E+00	3.859E+00
3.434143E-01	1.44774E+01	4.7170E+00	4.8698E+03	2.7505E+00	0.000E+00	3.610E+00
3.671099E-01	1.35372E+01	4.7169E+00	4.5553E+03	2.9853E+00	0.000E+00	3.377E+00
3.924405E-01	1.21052E+01	4.6945E+00	4.2411E+03	3.2276E+00	0.000E+00	3.159E+00
4.195189E-01	9.77113E+00	4.6509E+00	3.9305E+03	3.4762E+00	0.000E+00	2.955E+00
4.484657E-01	5.34162E+00	4.5879E+00	3.6270E+03	3.7298E+00	0.000E+00	2.765E+00
4.751040E-01	-5.39380E+00	4.4758E+00	3.3400E+03	3.9520E+00	0.000E+00	2.610E+00
4.794098E-01	-1.00246E+01	4.4569E+00	3.2961E+03	3.9869E+00	0.000E+00	2.586E+00
4.823760E-01	-1.59897E+01	4.4439E+00	3.2662E+03	4.0107E+00	0.000E+00	2.570E+00
4.834340E-01	-2.00565E+01	4.4393E+00	3.2557E+03	4.0192E+00	0.000E+00	2.565E+00
4.843152E-01	-2.71125E+01	4.4354E+00	3.2469E+03	4.0263E+00	0.000E+00	2.560E+00
4.872240E-01	-1.79385E+01	2.4794E+01	1.8042E+04	4.0495E+00	0.000E+00	2.545E+00
4.908335E-01	-1.55411E+01	2.4594E+01	1.7765E+04	4.0781E+00	0.000E+00	2.526E+00
4.928067E-01	-2.05115E+01	2.4486E+01	1.7616E+04	4.0937E+00	0.000E+00	2.516E+00
4.944960E-01	-1.51896E+01	3.8081E+01	2.7303E+04	4.1069E+00	0.000E+00	2.507E+00
4.957665E-01	-1.10983E+01	3.7968E+01	2.7152E+04	4.1169E+00	0.000E+00	2.501E+00
5.031660E-01	-1.09926E+00	3.7320E+01	2.6296E+04	4.1744E+00	0.000E+00	2.464E+00
5.124891E-01	5.02345E+00	3.6532E+01	2.5273E+04	4.2457E+00	0.000E+00	2.419E+00
5.478508E-01	1.60755E+01	3.3809E+01	2.1880E+04	4.5048E+00	0.000E+00	2.263E+00
5.856525E-01	2.17958E+01	3.1371E+01	1.8991E+04	4.7621E+00	0.000E+00	2.117E+00
6.260625E-01	2.54521E+01	2.9150E+01	1.6507E+04	5.0160E+00	0.000E+00	1.980E+00
6.692609E-01	2.76980E+01	2.7071E+01	1.4341E+04	5.2644E+00	0.000E+00	1.853E+00
7.001120E-01	2.79859E+01	2.5730E+01	1.3030E+04	5.4282E+00	0.000E+00	1.771E+00
7.108280E-01	2.69092E+01	2.5288E+01	1.2613E+04	5.4825E+00	0.000E+00	1.744E+00
7.136856E-01	2.52636E+01	2.5173E+01	1.2505E+04	5.4968E+00	0.000E+00	1.737E+00
7.154399E-01	2.57353E+01	2.8519E+01	1.4133E+04	5.5055E+00	0.000E+00	1.733E+00
7.179720E-01	2.71651E+01	2.8418E+01	1.4033E+04	5.5181E+00	0.000E+00	1.727E+00
7.286880E-01	2.89963E+01	2.7994E+01	1.3620E+04	5.5703E+00	0.000E+00	1.701E+00
7.412720E-01	2.99222E+01	2.7510E+01	1.3157E+04	5.6301E+00	0.000E+00	1.673E+00
7.526180E-01	3.00970E+01	2.7086E+01	1.2759E+04	5.6826E+00	0.000E+00	1.647E+00
7.556436E-01	2.95426E+01	2.6974E+01	1.2656E+04	5.6963E+00	0.000E+00	1.641E+00
7.601820E-01	3.05673E+01	2.8271E+01	1.3185E+04	5.7168E+00	0.000E+00	1.631E+00
7.648052E-01	3.12055E+01	2.8106E+01	1.3029E+04	5.7375E+00	0.000E+00	1.621E+00
7.715280E-01	3.18439E+01	2.7869E+01	1.2807E+04	5.7671E+00	0.000E+00	1.607E+00
8.175768E-01	3.44946E+01	2.6343E+01	1.1423E+04	5.9583E+00	0.000E+00	1.516E+00
8.661240E-01	3.60710E+01	2.4806E+01	1.0154E+04	6.1390E+00	0.000E+00	1.431E+00
8.739896E-01	3.61442E+01	2.4568E+01	9.9662E+03	6.1664E+00	0.000E+00	1.419E+00
8.793810E-01	3.60506E+01	2.4407E+01	9.8401E+03	6.1849E+00	0.000E+00	1.410E+00
8.829162E-01	3.56078E+01	2.4302E+01	9.7587E+03	6.1969E+00	0.000E+00	1.404E+00
8.882190E-01	3.63432E+01	2.5241E+01	1.0075E+04	6.2146E+00	0.000E+00	1.396E+00
9.014760E-01	3.72414E+01	2.4857E+01	9.7758E+03	6.2581E+00	0.000E+00	1.375E+00
9.342948E-01	3.85344E+01	2.3947E+01	9.0874E+03	6.3600E+00	0.000E+00	1.327E+00
9.987612E-01	4.03800E+01	2.2333E+01	7.9279E+03	6.5375E+00	0.000E+00	1.241E+00
1.067676E+00	4.17705E+01	2.0514E+01	6.8119E+03	6.6975E+00	0.000E+00	1.161E+00
1.141345E+00	4.27950E+01	1.8831E+01	5.8497E+03	6.8387E+00	0.000E+00	1.086E+00
1.220098E+00	4.35956E+01	1.7281E+01	5.0216E+03	6.9600E+00	0.000E+00	1.016E+00
1.304285E+00	4.42078E+01	1.5808E+01	4.2970E+03	7.0606E+00	0.000E+00	9.506E-01
1.394281E+00	4.46469E+01	1.4442E+01	3.6722E+03	7.1397E+00	0.000E+00	8.892E-01
1.490486E+00	4.49678E+01	1.3197E+01	3.1390E+03	7.1969E+00	0.000E+00	8.318E-01
1.593329E+00	4.51804E+01	1.2054E+01	2.6821E+03	7.2318E+00	0.000E+00	7.781E-01
1.703269E+00	4.53112E+01	1.1010E+01	2.2918E+03	7.2444E+00	0.000E+00	7.279E-01

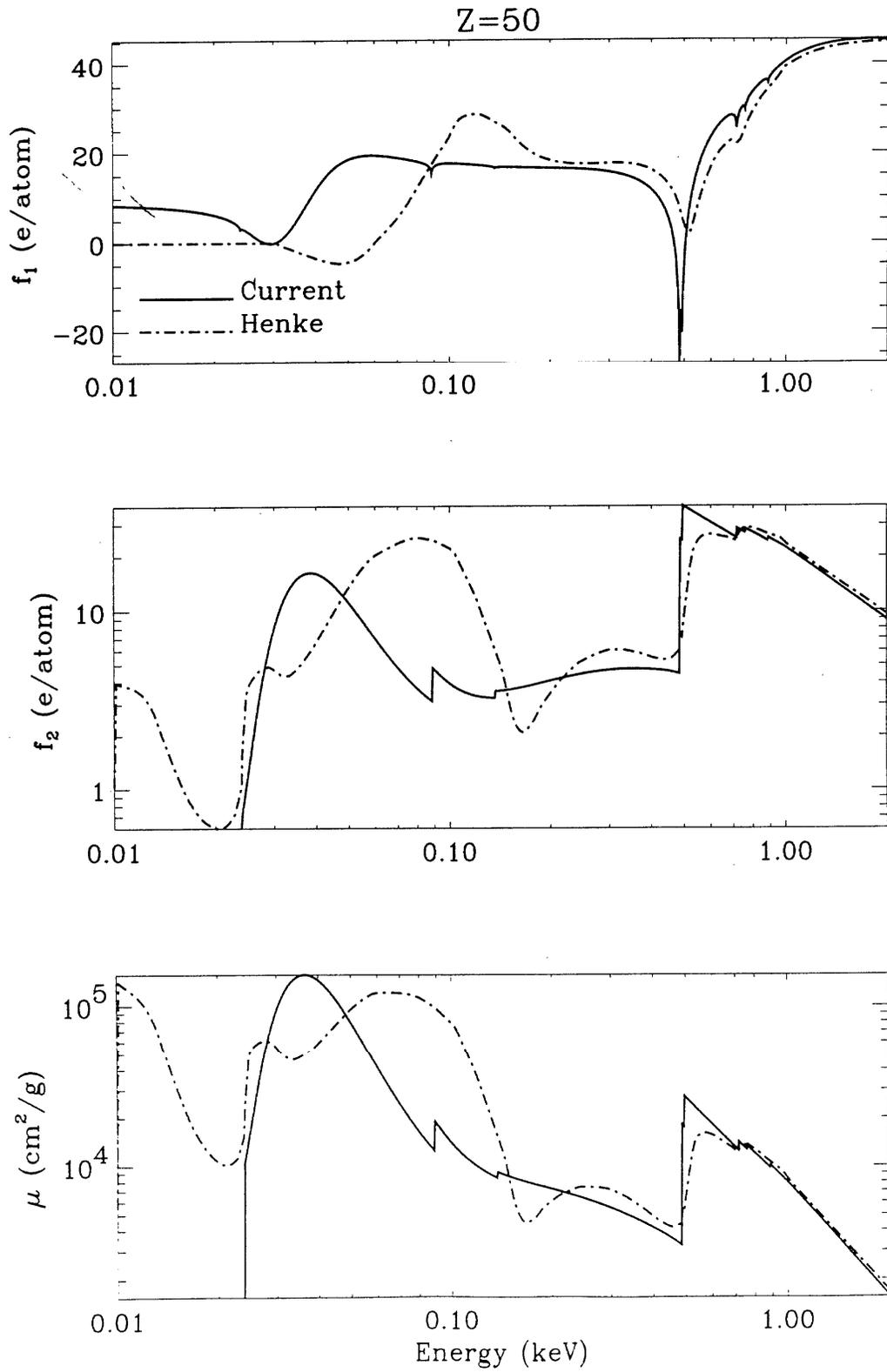
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1–92 367

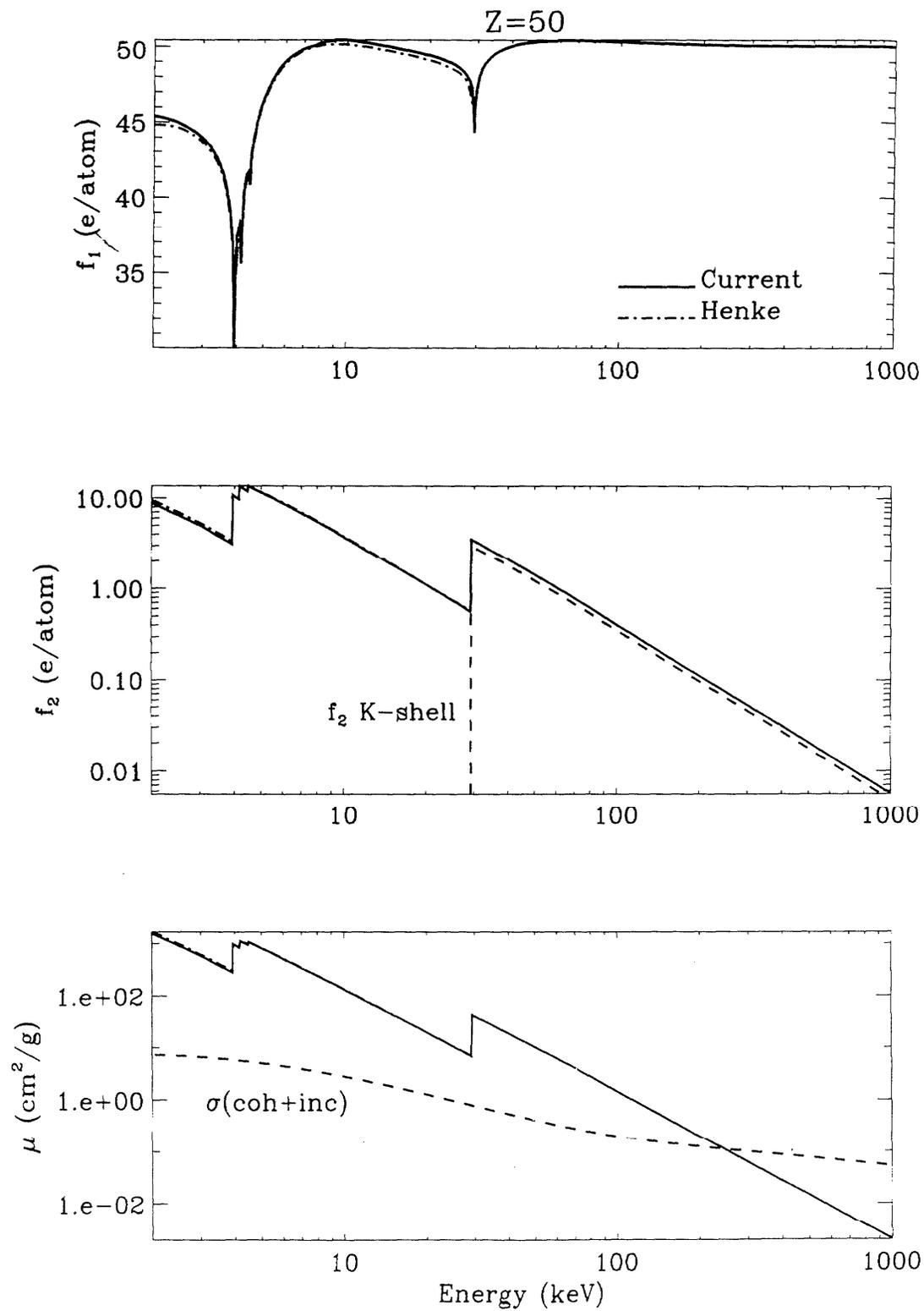
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1–92, from E = 0.001–0.010 keV to E = 400–1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.820795E+00	4.53763E+01	1.0055E+01	1.9579E+03	7.2348E+00	0.000E+00	6.809E-01
1.946430E+00	4.53928E+01	9.1859E+00	1.6732E+03	7.2033E+00	0.000E+00	6.370E-01
2.080733E+00	4.53446E+01	8.3312E+00	1.4196E+03	7.1506E+00	0.000E+00	5.959E-01
2.224304E+00	4.52231E+01	7.5618E+00	1.2053E+03	7.0773E+00	0.000E+00	5.574E-01
2.377781E+00	4.50418E+01	6.8741E+00	1.0250E+03	6.9844E+00	0.000E+00	5.214E-01
2.541848E+00	4.48028E+01	6.2588E+00	8.7299E+02	6.8729E+00	0.000E+00	4.878E-01
2.717235E+00	4.45039E+01	5.7068E+00	7.4461E+02	6.7439E+00	0.000E+00	4.563E-01
2.904724E+00	4.41350E+01	5.2058E+00	6.3540E+02	6.5988E+00	0.000E+00	4.268E-01
3.105150E+00	4.36444E+01	4.6802E+00	5.3437E+02	6.4390E+00	0.000E+00	3.993E-01
3.319406E+00	4.28802E+01	4.1619E+00	4.4453E+02	6.2659E+00	0.000E+00	3.735E-01
3.548445E+00	4.16355E+01	3.7073E+00	3.7041E+02	6.0811E+00	0.000E+00	3.494E-01
3.793288E+00	3.89148E+01	3.3031E+00	3.0873E+02	5.8861E+00	0.000E+00	3.269E-01
3.850224E+00	3.75113E+01	3.2198E+00	2.9649E+02	5.8413E+00	0.000E+00	3.220E-01
3.909156E+00	3.40273E+01	3.1372E+00	2.8453E+02	5.7953E+00	0.000E+00	3.172E-01
3.924871E+00	3.00304E+01	3.1158E+00	2.8146E+02	5.7830E+00	0.000E+00	3.159E-01
3.948444E+00	3.39408E+01	1.0820E+01	9.7158E+02	5.7647E+00	0.000E+00	3.140E-01
4.007376E+00	3.71907E+01	1.0465E+01	9.2590E+02	5.7191E+00	0.000E+00	3.094E-01
4.055024E+00	3.79931E+01	1.0191E+01	8.9103E+02	5.6825E+00	0.000E+00	3.058E-01
4.072978E+00	3.81101E+01	1.0090E+01	8.7834E+02	5.6688E+00	0.000E+00	3.044E-01
4.135319E+00	3.73576E+01	9.7618E+00	8.3693E+02	5.6213E+00	0.000E+00	2.998E-01
4.151944E+00	3.55879E+01	9.6868E+00	8.2717E+02	5.6087E+00	0.000E+00	2.986E-01
4.176880E+00	3.78115E+01	1.3408E+01	1.1381E+03	5.5898E+00	0.000E+00	2.968E-01
4.239222E+00	4.00581E+01	1.3018E+01	1.0887E+03	5.5430E+00	0.000E+00	2.925E-01
4.334821E+00	4.14391E+01	1.2464E+01	1.0194E+03	5.4719E+00	0.000E+00	2.860E-01
4.375406E+00	4.17235E+01	1.2248E+01	9.9248E+02	5.4420E+00	0.000E+00	2.834E-01
4.442377E+00	4.16034E+01	1.1923E+01	9.5159E+02	5.3930E+00	0.000E+00	2.791E-01
4.460236E+00	4.08219E+01	1.1840E+01	9.4118E+02	5.3801E+00	0.000E+00	2.780E-01
4.487024E+00	4.19740E+01	1.3561E+01	1.0715E+03	5.3607E+00	0.000E+00	2.763E-01
4.553994E+00	4.33023E+01	1.3250E+01	1.0315E+03	5.3125E+00	0.000E+00	2.723E-01
4.633924E+00	4.41919E+01	1.2901E+01	9.8705E+02	5.2557E+00	0.000E+00	2.676E-01
4.953664E+00	4.62573E+01	1.1694E+01	8.3698E+02	5.0356E+00	0.000E+00	2.503E-01
5.295467E+00	4.75557E+01	1.0597E+01	7.0951E+02	4.8129E+00	0.000E+00	2.341E-01
5.660855E+00	4.84498E+01	9.5551E+00	5.9843E+02	4.5891E+00	0.000E+00	2.190E-01
6.051453E+00	4.90715E+01	8.5908E+00	5.0331E+02	4.3653E+00	0.000E+00	2.049E-01
6.469004E+00	4.95000E+01	7.7135E+00	4.2274E+02	4.1430E+00	0.000E+00	1.917E-01
6.915365E+00	4.97938E+01	6.9246E+00	3.5501E+02	3.9230E+00	0.000E+00	1.793E-01
7.392525E+00	4.99926E+01	6.2190E+00	2.9826E+02	3.7066E+00	0.000E+00	1.677E-01
7.902609E+00	5.02028E+01	5.5891E+00	2.5075E+02	3.4946E+00	0.000E+00	1.569E-01
8.447890E+00	5.03272E+01	5.0166E+00	2.1053E+02	3.2878E+00	0.000E+00	1.468E-01
9.030794E+00	5.04269E+01	4.4908E+00	1.7631E+02	3.0869E+00	0.000E+00	1.373E-01
9.653919E+00	5.04277E+01	3.9815E+00	1.4622E+02	2.8926E+00	0.000E+00	1.284E-01
1.032004E+01	5.03869E+01	3.5329E+00	1.2137E+02	2.7053E+00	0.000E+00	1.201E-01
1.103212E+01	5.03224E+01	3.1377E+00	1.0084E+02	2.5255E+00	0.000E+00	1.124E-01
1.179334E+01	5.02428E+01	2.7892E+00	8.3852E+01	2.3534E+00	0.000E+00	1.051E-01
1.260708E+01	5.01534E+01	2.4818E+00	6.9794E+01	2.1894E+00	0.000E+00	9.834E-02
1.347697E+01	5.00578E+01	2.2102E+00	5.8144E+01	2.0334E+00	0.000E+00	9.200E-02
1.440688E+01	4.99577E+01	1.9686E+00	4.8446E+01	1.8857E+00	0.000E+00	8.606E-02
1.540095E+01	4.98538E+01	1.7545E+00	4.0390E+01	1.7461E+00	0.000E+00	8.050E-02
1.646362E+01	4.97468E+01	1.5653E+00	3.3708E+01	1.6147E+00	0.000E+00	7.531E-02
1.759961E+01	4.96362E+01	1.3947E+00	2.8096E+01	1.4913E+00	0.000E+00	7.045E-02
1.881398E+01	4.95174E+01	1.2404E+00	2.3375E+01	1.3758E+00	0.000E+00	6.590E-02
2.011215E+01	4.93865E+01	1.1005E+00	1.9401E+01	1.2679E+00	0.000E+00	6.165E-02
2.149988E+01	4.92350E+01	9.7529E-01	1.6083E+01	1.1674E+00	0.000E+00	5.767E-02
2.298338E+01	4.90522E+01	8.6507E-01	1.3344E+01	1.0741E+00	0.000E+00	5.395E-02
2.456923E+01	4.88135E+01	7.6798E-01	1.1082E+01	9.8758E-01	0.000E+00	5.046E-02
2.626450E+01	4.84518E+01	6.8240E-01	9.2116E+00	9.0762E-01	0.000E+00	4.721E-02
2.807676E+01	4.76648E+01	6.0051E-01	7.5830E+00	8.3387E-01	0.000E+00	4.416E-02
2.861610E+01	4.70981E+01	5.7853E-01	7.1678E+00	8.1393E-01	0.000E+00	4.333E-02
2.905410E+01	4.58386E+01	5.6159E-01	6.8530E+00	7.9835E-01	0.000E+00	4.267E-02
2.917090E+01	4.43250E+01	5.5721E-01	6.7722E+00	7.9429E-01	0.000E+00	4.250E-02
2.934610E+01	4.58608E+01	3.5328E+00	4.2681E+01	7.8826E-01	3.603E+01	4.225E-02
2.978410E+01	4.72498E+01	3.4443E+00	4.1000E+01	7.7353E-01	3.463E+01	4.163E-02
3.001405E+01	4.75904E+01	3.3992E+00	4.0153E+01	7.6600E-01	3.393E+01	4.131E-02
3.208502E+01	4.88917E+01	3.0381E+00	3.3571E+01	7.0367E-01	2.846E+01	3.864E-02
3.429889E+01	4.94402E+01	2.7208E+00	2.8124E+01	6.4655E-01	2.392E+01	3.615E-02

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
3.666551E+01	4.97671E+01	2.4382E+00	2.3577E+01	5.9430E-01	2.011E+01	3.381E-02
3.919543E+01	4.99853E+01	2.1809E+00	1.9727E+01	5.4660E-01	1.687E+01	3.163E-02
4.189992E+01	5.01305E+01	1.9457E+00	1.6463E+01	5.0313E-01	1.411E+01	2.959E-02
4.479101E+01	5.02279E+01	1.7347E+00	1.3731E+01	4.6358E-01	1.179E+01	2.768E-02
4.788159E+01	5.02924E+01	1.5459E+00	1.1446E+01	4.2764E-01	9.845E+00	2.589E-02
5.118542E+01	5.03335E+01	1.3771E+00	9.5388E+00	3.9503E-01	8.216E+00	2.422E-02
5.471721E+01	5.03579E+01	1.2266E+00	7.9476E+00	3.6549E-01	6.854E+00	2.266E-02
5.849270E+01	5.04028E+01	1.0924E+00	6.6212E+00	3.3874E-01	5.716E+00	2.120E-02
6.252870E+01	5.04047E+01	9.6868E-01	5.4924E+00	3.1455E-01	4.743E+00	1.983E-02
6.684318E+01	5.03982E+01	8.5903E-01	4.5563E+00	2.9269E-01	3.936E+00	1.855E-02
7.145536E+01	5.03866E+01	7.6186E-01	3.7801E+00	2.7294E-01	3.266E+00	1.735E-02
7.638578E+01	5.03718E+01	6.7575E-01	3.1364E+00	2.5511E-01	2.710E+00	1.623E-02
8.165640E+01	5.03569E+01	5.9847E-01	2.5985E+00	2.3901E-01	2.246E+00	1.518E-02
8.729069E+01	5.03380E+01	5.2820E-01	2.1453E+00	2.2446E-01	1.855E+00	1.420E-02
9.331374E+01	5.03177E+01	4.6621E-01	1.7713E+00	2.1131E-01	1.532E+00	1.329E-02
9.975239E+01	5.02969E+01	4.1152E-01	1.4626E+00	1.9941E-01	1.266E+00	1.243E-02
1.066353E+02	5.02763E+01	3.6327E-01	1.2078E+00	1.8863E-01	1.046E+00	1.163E-02
1.139931E+02	5.02561E+01	3.2071E-01	9.9745E-01	1.7886E-01	8.638E-01	1.088E-02
1.218587E+02	5.02366E+01	2.8314E-01	8.2378E-01	1.6997E-01	7.136E-01	1.017E-02
1.302669E+02	5.02181E+01	2.4995E-01	6.8027E-01	1.6187E-01	5.893E-01	9.518E-03
1.392553E+02	5.02004E+01	2.2061E-01	5.6166E-01	1.5448E-01	4.866E-01	8.903E-03
1.488640E+02	5.01838E+01	1.9472E-01	4.6375E-01	1.4770E-01	4.018E-01	8.329E-03
1.591356E+02	5.01682E+01	1.7188E-01	3.8294E-01	1.4147E-01	3.317E-01	7.791E-03
1.701159E+02	5.01536E+01	1.5173E-01	3.1622E-01	1.3572E-01	2.739E-01	7.288E-03
1.818539E+02	5.01401E+01	1.3395E-01	2.6114E-01	1.3040E-01	2.262E-01	6.818E-03
1.944018E+02	5.01276E+01	1.1825E-01	2.1566E-01	1.2544E-01	1.867E-01	6.378E-03
2.078156E+02	5.01161E+01	1.0440E-01	1.7812E-01	1.2081E-01	1.542E-01	5.966E-03
2.221548E+02	5.01054E+01	9.2181E-02	1.4711E-01	1.1647E-01	1.273E-01	5.581E-03
2.374835E+02	5.00957E+01	8.1392E-02	1.2151E-01	1.1238E-01	1.051E-01	5.221E-03
2.538699E+02	5.00867E+01	7.1870E-02	1.0037E-01	1.0852E-01	8.679E-02	4.884E-03
2.713869E+02	5.00785E+01	6.3464E-02	8.2909E-02	1.0484E-01	7.166E-02	4.569E-03
2.901126E+02	5.00711E+01	5.6043E-02	6.8489E-02	1.0133E-01	5.916E-02	4.274E-03
3.101304E+02	5.00642E+01	4.9492E-02	5.6580E-02	9.7978E-02	4.885E-02	3.998E-03
3.315294E+02	5.00580E+01	4.3709E-02	4.6743E-02	9.4755E-02	4.033E-02	3.740E-03
3.544049E+02	5.00524E+01	3.8603E-02	3.8618E-02	9.1650E-02	3.330E-02	3.498E-03
3.788588E+02	5.00473E+01	3.4094E-02	3.1906E-02	8.8650E-02	2.750E-02	3.273E-03
4.050001E+02	5.00426E+01	3.0114E-02	2.6362E-02	8.5744E-02	2.270E-02	3.061E-03
4.329451E+02	5.00384E+01	2.6598E-02	2.1782E-02	8.2924E-02	1.875E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 371

Sb Z = 51

Atomic weight = 1.217500E+02 g/mol, nominal density ρ (g/cm³) = 6.6790E+00

$\mu_{\text{ph}}(\text{barns/atom}) = \mu(\text{cm}^2/\text{g}) \times 2.02171\text{E}+02$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 3.45629\text{E}+05$

Edges. Edge energies (keV):

K	3.04912E+00	L	I	4.69830E+00	L	II	4.38040E+00	L	III	4.13220E+00	
M	I	9.43700E-00	M	II	8.11900E-00	M	III	7.65600E-00	M	IV	5.36900E-01
N	V	5.27500E-00	N	I	1.52000E-00	N	II	9.84000E-02	N	III	9.84000E-02
N	IV	3.14000E-02	N	V	3.14000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -5.5841E-01, -3.4500E-01 e/atom

Nuclear Thomson correction $f_{\text{NT}} = -1.1720\text{E}-02$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	5.60066E+00	0.0000E+00	0.0000E+00	8.4545E-05	0.000E+00	1.160E+02
1.142761E-02	5.50128E+00	0.0000E+00	0.0000E+00	1.1749E-04	0.000E+00	1.085E+02
1.221612E-02	5.38564E+00	0.0000E+00	0.0000E+00	1.6235E-04	0.000E+00	1.015E+02
1.305903E-02	5.25072E+00	0.0000E+00	0.0000E+00	2.2308E-04	0.000E+00	9.494E+01
1.396010E-02	5.09278E+00	0.0000E+00	0.0000E+00	3.0484E-04	0.000E+00	8.881E+01
1.492335E-02	4.90714E+00	0.0000E+00	0.0000E+00	4.1428E-04	0.000E+00	8.308E+01
1.595306E-02	4.68795E+00	0.0000E+00	0.0000E+00	5.5991E-04	0.000E+00	7.772E+01
1.705382E-02	4.42767E+00	0.0000E+00	0.0000E+00	7.5262E-04	0.000E+00	7.270E+01
1.823053E-02	4.11650E+00	0.0000E+00	0.0000E+00	1.0062E-03	0.000E+00	6.801E+01
1.948844E-02	3.74142E+00	0.0000E+00	0.0000E+00	1.3379E-03	0.000E+00	6.362E+01
2.083314E-02	3.28467E+00	0.0000E+00	0.0000E+00	1.7696E-03	0.000E+00	5.951E+01
2.227063E-02	2.72124E+00	0.0000E+00	0.0000E+00	2.3281E-03	0.000E+00	5.567E+01
2.380730E-02	2.01461E+00	0.0000E+00	0.0000E+00	3.0467E-03	0.000E+00	5.208E+01
2.545001E-02	1.10848E+00	0.0000E+00	0.0000E+00	3.9662E-03	0.000E+00	4.872E+01
2.720606E-02	-9.05118E-02	0.0000E+00	0.0000E+00	5.1364E-03	0.000E+00	4.557E+01
2.908327E-02	-1.75747E+00	0.0000E+00	0.0000E+00	6.6175E-03	0.000E+00	4.263E+01
3.077200E-02	-3.84438E+00	0.0000E+00	0.0000E+00	8.1662E-03	0.000E+00	4.029E+01
3.109002E-02	-4.36403E+00	0.0000E+00	0.0000E+00	8.4818E-03	0.000E+00	3.988E+01
3.124300E-02	-4.65656E+00	0.0000E+00	0.0000E+00	8.6363E-03	0.000E+00	3.968E+01
3.136860E-02	-4.98693E+00	0.0000E+00	0.0000E+00	8.7645E-03	0.000E+00	3.952E+01
3.155700E-02	-5.20918E+00	2.5761E-01	2.8215E+03	8.9592E-03	0.000E+00	3.929E+01
3.202800E-02	-5.96971E+00	3.7031E-01	3.9962E+03	9.4578E-03	0.000E+00	3.871E+01
3.323523E-02	-8.47735E+00	9.1655E-01	9.5316E+03	1.0816E-02	0.000E+00	3.731E+01
3.52846E-02	-1.49079E+01	4.4790E+00	4.3573E+04	1.3722E-02	0.000E+00	3.490E+01
3.797993E-02	-2.07779E+01	1.4207E+01	1.2929E+05	1.7322E-02	0.000E+00	3.264E+01
4.060054E-02	-1.99494E+01	2.9219E+01	2.4873E+05	2.1757E-02	0.000E+00	3.054E+01
4.340198E-02	-9.21232E+00	4.2628E+01	3.3946E+05	2.7191E-02	0.000E+00	2.857E+01
4.639671E-02	7.33816E+00	4.7650E+01	5.5496E+05	3.3816E-02	0.000E+00	2.672E+01
4.959809E-02	2.25266E+01	4.3565E+01	3.0359E+05	4.1848E-02	0.000E+00	2.500E+01
5.302035E-02	3.20942E+01	3.4420E+01	2.2438E+05	5.1536E-02	0.000E+00	2.338E+01
5.667876E-02	3.59127E+01	2.4603E+01	1.5003E+05	6.3160E-02	0.000E+00	2.187E+01
6.058959E-02	3.58926E+01	1.6521E+01	9.4243E+04	7.7035E-02	0.000E+00	2.046E+01
6.477028E-02	3.40081E+01	1.0746E+01	5.7344E+04	9.3510E-02	0.000E+00	1.914E+01
6.923942E-02	3.15490E+01	6.9378E+00	3.4632E+04	1.1297E-01	0.000E+00	1.791E+01
7.401695E-02	2.91518E+01	4.5311E+00	2.1158E+04	1.3584E-01	0.000E+00	1.675E+01
7.912411E-02	2.70458E+01	3.0369E+00	1.3266E+04	1.6258E-01	0.000E+00	1.567E+01
8.458368E-02	2.52544E+01	2.1106E+00	8.6242E+03	1.9369E-01	0.000E+00	1.466E+01
9.041995E-02	2.36943E+01	1.5317E+00	5.8548E+03	2.2969E-01	0.000E+00	1.371E+01
9.643200E-02	2.20731E+01	1.1759E+00	4.2147E+03	2.6957E-01	0.000E+00	1.286E+01
9.665893E-02	2.19889E+01	1.1656E+00	4.1680E+03	2.7113E-01	0.000E+00	1.283E+01
9.790800E-02	2.12835E+01	1.1122E+00	3.9263E+03	2.7978E-01	0.000E+00	1.266E+01
9.830160E-02	2.05485E+01	1.0964E+00	3.8551E+03	2.8253E-01	0.000E+00	1.261E+01
9.889200E-02	2.11727E+01	2.4069E+00	8.4122E+03	2.8667E-01	0.000E+00	1.254E+01
1.003680E-01	2.15874E+01	2.3200E+00	7.9891E+03	2.9714E-01	0.000E+00	1.235E+01
1.033284E-01	2.16265E+01	2.1662E+00	7.2459E+03	3.1860E-01	0.000E+00	1.200E+01
1.104581E-01	2.12341E+01	1.8840E+00	5.8952E+03	3.7271E-01	0.000E+00	1.122E+01
1.180797E-01	2.07308E+01	1.7036E+00	4.9866E+03	4.3406E-01	0.000E+00	1.050E+01
1.262272E-01	2.02370E+01	1.6018E+00	4.3860E+03	5.0327E-01	0.000E+00	9.822E+00
1.349368E-01	1.97643E+01	1.5574E+00	3.9891E+03	5.8095E-01	0.000E+00	9.188E+00
1.442475E-01	1.92875E+01	1.5578E+00	3.7327E+03	6.6771E-01	0.000E+00	8.595E+00
1.489600E-01	1.90102E+01	1.5713E+00	3.6458E+03	7.1292E-01	0.000E+00	8.323E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.512400E-01	1.87825E+01	1.5803E+00	3.6114E+03	7.3508E-01	0.000E+00	8.198E+00
1.518480E-01	1.85939E+01	1.5829E+00	3.6030E+03	7.4102E-01	0.000E+00	8.165E+00
1.527600E-01	1.87254E+01	1.9125E+00	4.3270E+03	7.4995E-01	0.000E+00	8.116E+00
1.542005E-01	1.87836E+01	1.9230E+00	4.3102E+03	7.6411E-01	0.000E+00	8.040E+00
1.550400E-01	1.87879E+01	1.9293E+00	4.3011E+03	7.7240E-01	0.000E+00	7.997E+00
1.648404E-01	1.86293E+01	2.0151E+00	4.2251E+03	8.7068E-01	0.000E+00	7.521E+00
1.762144E-01	1.83933E+01	2.1333E+00	4.1843E+03	9.8789E-01	0.000E+00	7.036E+00
1.883732E-01	1.81581E+01	2.2710E+00	4.1669E+03	1.1162E+00	0.000E+00	6.582E+00
2.013709E-01	1.79281E+01	2.4256E+00	4.1633E+03	1.2558E+00	0.000E+00	6.157E+00
2.152655E-01	1.77023E+01	2.5975E+00	4.1706E+03	1.4070E+00	0.000E+00	5.760E+00
2.301188E-01	1.74794E+01	2.7840E+00	4.1815E+03	1.5700E+00	0.000E+00	5.388E+00
2.459970E-01	1.72549E+01	2.9781E+00	4.1843E+03	1.7447E+00	0.000E+00	5.040E+00
2.629708E-01	1.70152E+01	3.1730E+00	4.1703E+03	1.9310E+00	0.000E+00	4.715E+00
2.811158E-01	1.67428E+01	3.3666E+00	4.1392E+03	2.1286E+00	0.000E+00	4.410E+00
3.005128E-01	1.64168E+01	3.5553E+00	4.0891E+03	2.3370E+00	0.000E+00	4.126E+00
3.212482E-01	1.60178E+01	3.7348E+00	4.0183E+03	2.5558E+00	0.000E+00	3.859E+00
3.434143E-01	1.55023E+01	3.9011E+00	3.9262E+03	2.7841E+00	0.000E+00	3.610E+00
3.671099E-01	1.48094E+01	4.0507E+00	3.8137E+03	3.0211E+00	0.000E+00	3.377E+00
3.924405E-01	1.38406E+01	4.1813E+00	3.6826E+03	3.2656E+00	0.000E+00	3.159E+00
4.195189E-01	1.24195E+01	4.2907E+00	3.5350E+03	3.5164E+00	0.000E+00	2.955E+00
4.484657E-01	1.01810E+01	4.3779E+00	3.3740E+03	3.7722E+00	0.000E+00	2.765E+00
4.794098E-01	6.15466E+00	4.4440E+00	3.2039E+03	4.0315E+00	0.000E+00	2.586E+00
5.124891E-01	-4.39626E+00	4.4816E+00	3.0224E+03	4.2927E+00	0.000E+00	2.419E+00
5.169500E-01	-7.65911E+00	4.4842E+00	2.9981E+03	4.3267E+00	0.000E+00	2.398E+00
5.248625E-01	-1.99185E+01	4.4879E+00	2.9553E+03	4.3862E+00	0.000E+00	2.362E+00
5.261620E-01	-2.55442E+01	4.4884E+00	2.9484E+03	4.3959E+00	0.000E+00	2.356E+00
5.269725E-01	-3.30107E+01	4.4887E+00	2.9440E+03	4.4019E+00	0.000E+00	2.353E+00
5.301375E-01	-2.18369E+01	2.8634E+01	1.8669E+04	4.4234E+00	0.000E+00	2.339E+00
5.342155E-01	-1.86600E+01	2.8262E+01	1.8285E+04	4.4554E+00	0.000E+00	2.321E+00
5.363631E-01	-2.43979E+01	2.8069E+01	1.8087E+04	4.4711E+00	0.000E+00	2.312E+00
5.380500E-01	-1.88391E+01	4.3941E+01	2.8226E+04	4.4834E+00	0.000E+00	2.304E+00
5.395845E-01	-1.32225E+01	4.3714E+01	2.8001E+04	4.4945E+00	0.000E+00	2.298E+00
5.478508E-01	-1.09635E+00	4.2526E+01	2.6829E+04	4.5540E+00	0.000E+00	2.263E+00
5.856525E-01	1.63151E+01	3.7707E+01	2.2253E+04	4.8136E+00	0.000E+00	2.117E+00
6.260625E-01	2.32994E+01	3.3734E+01	1.8624E+04	5.0696E+00	0.000E+00	1.980E+00
6.692609E-01	2.72541E+01	3.0618E+01	1.5812E+04	5.3203E+00	0.000E+00	1.853E+00
7.154399E-01	2.95461E+01	2.8003E+01	1.3528E+04	5.5652E+00	0.000E+00	1.733E+00
7.502880E-01	2.98255E+01	2.6331E+01	1.2129E+04	5.7314E+00	0.000E+00	1.652E+00
7.617720E-01	2.87013E+01	2.5821E+01	1.1715E+04	5.7839E+00	0.000E+00	1.628E+00
7.648052E-01	2.70528E+01	2.5689E+01	1.1609E+04	5.7976E+00	0.000E+00	1.621E+00
7.648344E-01	2.70121E+01	2.5688E+01	1.1608E+04	5.7977E+00	0.000E+00	1.621E+00
7.694280E-01	2.89494E+01	2.8986E+01	1.3021E+04	5.8182E+00	0.000E+00	1.611E+00
7.809120E-01	3.08036E+01	2.8502E+01	1.2615E+04	5.8685E+00	0.000E+00	1.588E+00
7.956620E-01	3.17950E+01	2.7902E+01	1.2120E+04	5.9312E+00	0.000E+00	1.558E+00
8.078405E-01	3.19318E+01	2.7424E+01	1.1733E+04	5.9814E+00	0.000E+00	1.535E+00
8.110881E-01	3.13556E+01	2.7299E+01	1.1633E+04	5.9945E+00	0.000E+00	1.529E+00
8.159595E-01	3.23883E+01	2.8607E+01	1.2118E+04	6.0140E+00	0.000E+00	1.519E+00
8.175768E-01	3.26333E+01	2.8546E+01	1.2068E+04	6.0205E+00	0.000E+00	1.516E+00
8.281380E-01	3.36578E+01	2.8156E+01	1.1751E+04	6.0619E+00	0.000E+00	1.497E+00
8.739896E-01	3.60758E+01	2.6568E+01	1.0507E+04	6.2305E+00	0.000E+00	1.419E+00
9.248260E-01	3.75487E+01	2.4989E+01	9.3388E+03	6.3971E+00	0.000E+00	1.341E+00
9.342948E-01	3.76111E+01	2.4714E+01	9.1425E+03	6.4260E+00	0.000E+00	1.327E+00
9.389815E-01	3.75172E+01	2.4580E+01	9.0475E+03	6.4400E+00	0.000E+00	1.320E+00
9.427563E-01	3.70730E+01	2.4472E+01	8.9719E+03	6.4512E+00	0.000E+00	1.315E+00
9.484185E-01	3.78019E+01	2.5405E+01	9.2583E+03	6.4678E+00	0.000E+00	1.307E+00
9.625740E-01	3.86901E+01	2.5015E+01	8.9821E+03	6.5082E+00	0.000E+00	1.288E+00
9.987612E-01	4.00143E+01	2.4069E+01	8.3294E+03	6.6053E+00	0.000E+00	1.241E+00
1.067676E+00	4.18815E+01	2.2119E+01	7.1605E+03	6.7670E+00	0.000E+00	1.161E+00
1.141745E+00	4.31430E+01	2.0307E+01	6.1494E+03	6.9298E+00	0.000E+00	1.086E+00
1.220098E+00	4.40900E+01	1.8640E+01	5.2803E+03	7.0326E+00	0.000E+00	1.016E+00
1.304285E+00	4.48358E+01	1.7107E+01	4.5333E+03	7.1346E+00	0.000E+00	9.506E-01
1.394281E+00	4.54081E+01	1.5648E+01	3.8790E+03	7.2149E+00	0.000E+00	8.892E-01
1.490486E+00	4.58155E+01	1.4293E+01	3.3143E+03	7.2731E+00	0.000E+00	8.318E-01
1.593329E+00	4.61106E+01	1.3058E+01	2.8325E+03	7.3089E+00	0.000E+00	7.781E-01
1.703269E+00	4.63046E+01	1.1926E+01	2.4200E+03	7.3223E+00	0.000E+00	7.279E-01

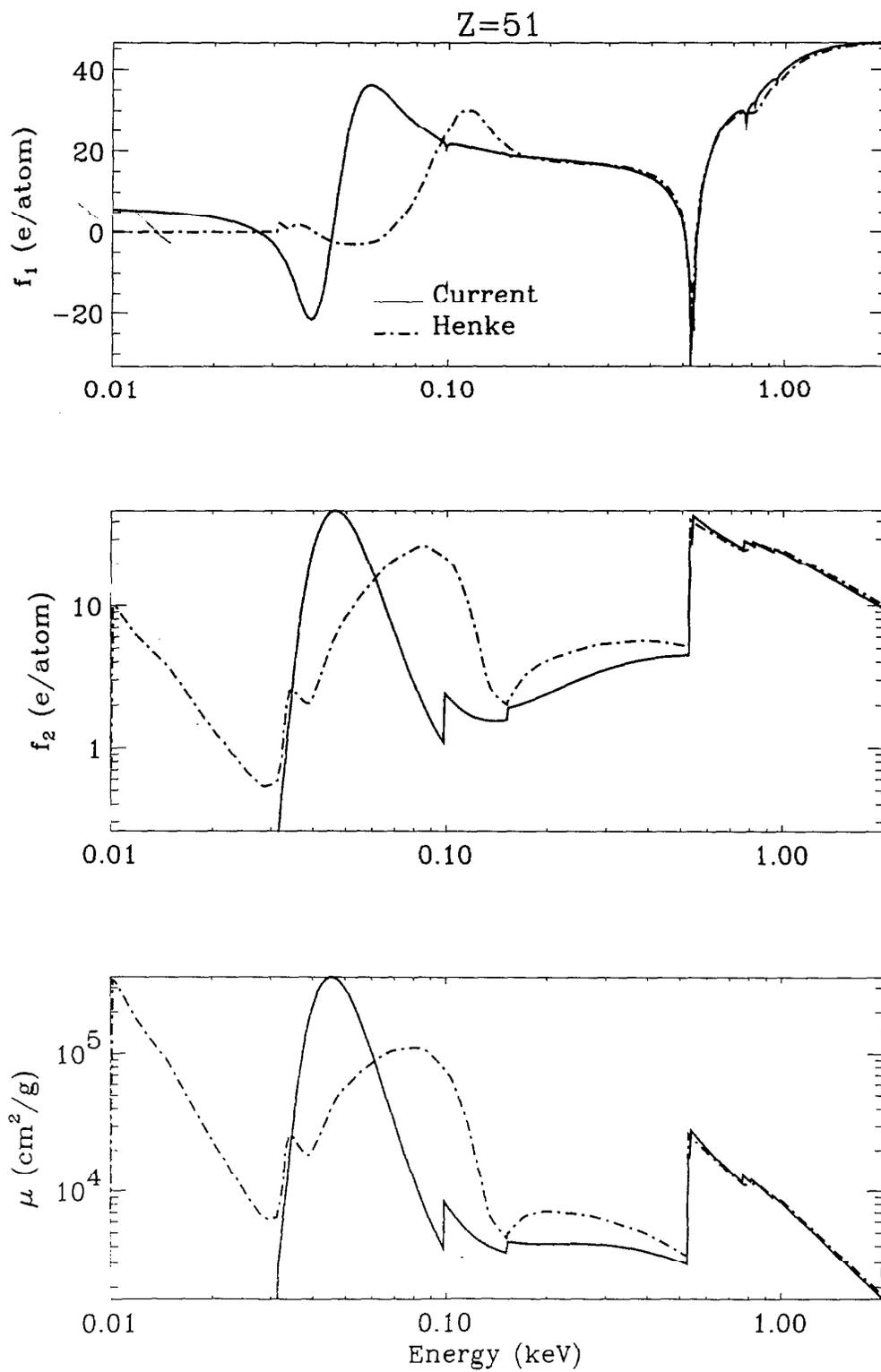
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 373

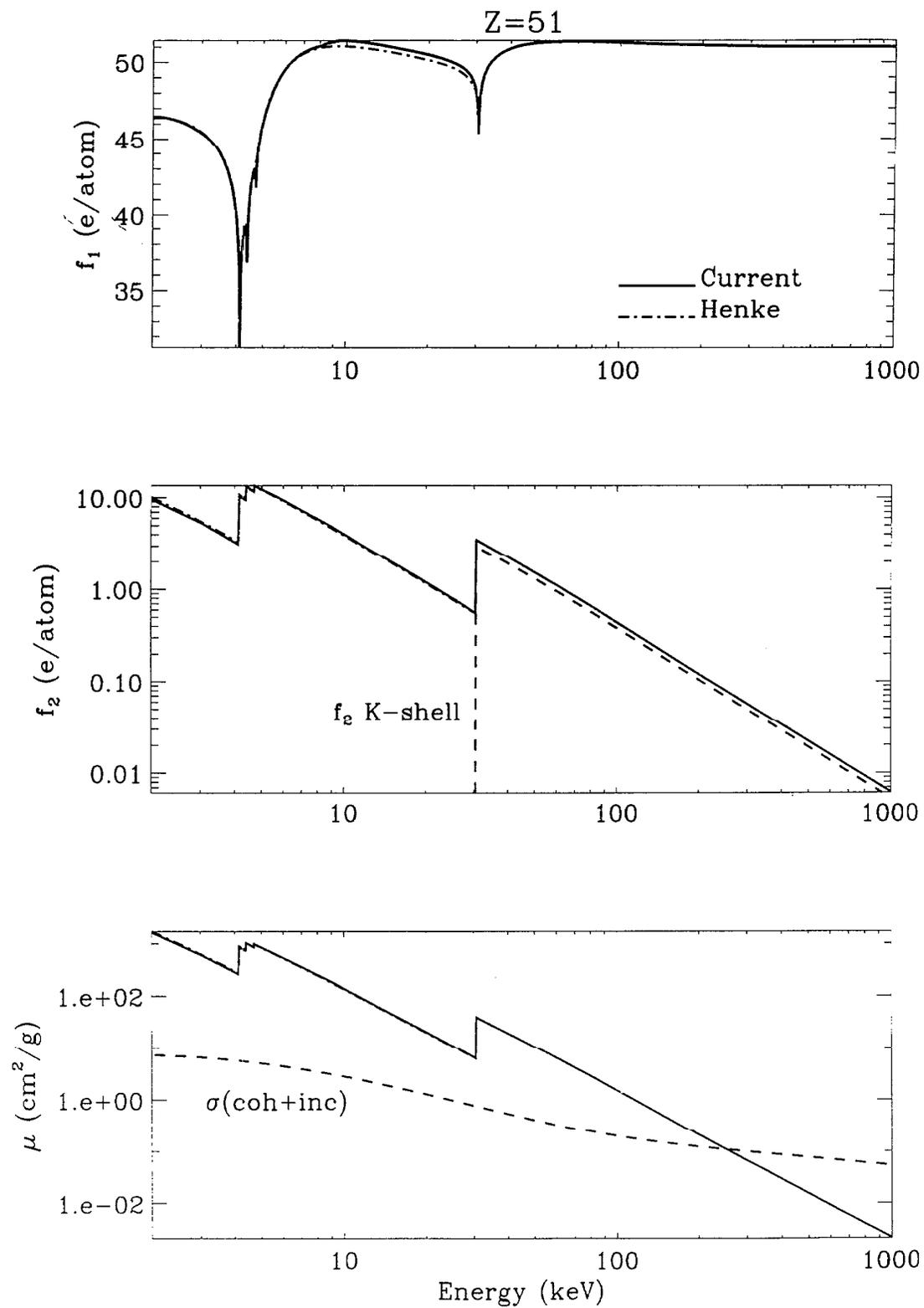
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV --- Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.820795F+00	4.64133E+01	1.0897E+01	2.0684E+03	7.3133E+00	0.000E+00	6.809E-01
1.946430E+00	4.64607E+01	9.9536E+00	1.7675E+03	7.2823E+00	0.000E+00	6.370E-01
2.080733E+00	4.64584E+01	9.0959E+00	1.5109E+03	7.2298E+00	0.000E+00	5.959E-01
2.224304E+00	4.64054E+01	8.2687E+00	1.2849E+03	7.1566E+00	0.000E+00	5.574E-01
2.377781E+00	4.62816E+01	7.5066E+00	1.0911E+03	7.0636E+00	0.000E+00	5.214E-01
2.541848E+00	4.60945E+01	6.8253E+00	9.2807E+02	6.9518E+00	0.000E+00	4.878E-01
2.717235E+00	4.58465E+01	6.2155E+00	7.9061E+02	6.8223E+00	0.000E+00	4.563E-01
2.904724E+00	4.55381E+01	5.6689E+00	6.7454E+02	6.6766E+00	0.000E+00	4.268E-01
3.105150E+00	4.51717E+01	5.1180E+00	5.6968E+02	6.5160E+00	0.000E+00	3.993E-01
3.319406E+00	4.46190E+01	4.5597E+00	4.7477E+02	6.3419E+00	0.000E+00	3.735E-01
3.548445E+00	4.37679E+01	4.0612E+00	3.9557E+02	6.1559E+00	0.000E+00	3.494E-01
3.793288E+00	4.23394E+01	3.6230E+00	3.3011E+02	5.9596E+00	0.000E+00	3.269E-01
4.049556E+00	3.86985E+01	3.2402E+00	2.7655E+02	5.7588E+00	0.000E+00	3.062E-01
4.055024E+00	3.85259E+01	3.2328E+00	2.7554E+02	5.7546E+00	0.000E+00	3.058E-01
4.111539E+00	3.52495E+01	3.1579E+00	2.6546E+02	5.7111E+00	0.000E+00	3.016E-01
4.128068E+00	3.12844E+01	3.1365E+00	2.6261E+02	5.6984E+00	0.000E+00	3.003E-01
4.152861E+00	3.51768E+01	1.0786E+01	8.9766E+02	5.6795E+00	0.000E+00	2.986E-01
4.214844E+00	3.84252E+01	1.0425E+01	8.5487E+02	5.6324E+00	0.000E+00	2.942E-01
4.292792E+00	3.94207E+01	9.9960E+00	8.0482E+02	5.5737E+00	0.000E+00	2.888E-01
4.334821E+00	3.92292E+01	9.7756E+00	7.7944E+02	5.5423E+00	0.000E+00	2.860E-01
4.358498E+00	3.86196E+01	9.6715E+00	7.6695E+02	5.5248E+00	0.000E+00	2.845E-01
4.376020E+00	3.68523E+01	9.5967E+00	7.5797E+02	5.5118E+00	0.000E+00	2.833E-01
4.402302E+00	3.90524E+01	1.3294E+01	1.0437E+03	5.4924E+00	0.000E+00	2.816E-01
4.468008E+00	4.12611E+01	1.2901E+01	9.9797E+02	5.4441E+00	0.000E+00	2.775E-01
4.604334E+00	4.28218E+01	1.2162E+01	9.1295E+02	5.3456E+00	0.000E+00	2.693E-01
4.633924E+00	4.29076E+01	1.2022E+01	8.9672E+02	5.3245E+00	0.000E+00	2.676E-01
4.674808E+00	4.27008E+01	1.1837E+01	8.7513E+02	5.2955E+00	0.000E+00	2.652E-01
4.693602E+00	4.19213E+01	1.1754E+01	8.6552E+02	5.2822E+00	0.000E+00	2.642E-01
4.721791E+00	4.30690E+01	1.3468E+01	9.8582E+02	5.2623E+00	0.000E+00	2.626E-01
4.792266E+00	4.43895E+01	1.3158E+01	9.4896E+02	5.2131E+00	0.000E+00	2.587E-01
4.953664E+00	4.58807E+01	1.2511E+01	8.7293E+02	5.1025E+00	0.000E+00	2.503E-01
5.295457E+00	4.76632E+01	1.1356E+01	7.4119E+02	4.8779E+00	0.000E+00	2.341E-01
5.660855E+00	4.88405E+01	1.0281E+01	6.2771E+02	4.6520E+00	0.000E+00	2.190E-01
6.051453E+00	4.96541E+01	9.2620E+00	5.2900E+02	4.4261E+00	0.000E+00	2.049E-01
6.469004E+00	5.02187E+01	8.3229E+00	4.4468E+02	4.2015E+00	0.000E+00	1.917E-01
6.915365E+00	5.06070E+01	7.4727E+00	3.7349E+02	3.9793E+00	0.000E+00	1.793E-01
7.392525E+00	5.08727E+01	6.7098E+00	3.1871E+02	3.7606E+00	0.000E+00	1.677E-01
7.902609E+00	5.10531E+01	6.0285E+00	2.6366E+02	3.5463E+00	0.000E+00	1.569E-01
8.447890E+00	5.12517E+01	5.4184E+00	2.2168E+02	3.3371E+00	0.000E+00	1.468E-01
9.030794E+00	5.13849E+01	4.8549E+00	1.8581E+02	3.1339E+00	0.000E+00	1.373E-01
9.653919E+00	5.14451E+01	4.3109E+00	1.5434E+02	2.9372E+00	0.000E+00	1.284E-01
1.032004E+01	5.14241E+01	3.8246E+00	1.2809E+02	2.7476E+00	0.000E+00	1.201E-01
1.103212E+01	5.13726E+01	3.3957E+00	1.0639E+02	2.5655E+00	0.000E+00	1.124E-01
1.179334E+01	5.13015E+01	3.0177E+00	8.8440E+01	2.3911E+00	0.000E+00	1.051E-01
1.260708E+01	5.12178E+01	2.6842E+00	7.3589E+01	2.2248E+00	0.000E+00	9.834E-02
1.347697E+01	5.11259E+01	2.3898E+00	6.1288E+01	2.0667E+00	0.000E+00	9.200E-02
1.440688E+01	5.10287E+01	2.1296E+00	5.1089E+01	1.9168E+00	0.000E-00	8.606E-02
1.540095E+01	5.09275E+01	1.8978E+00	4.2591E+01	1.7752E+00	0.000E+00	8.050E-02
1.646362E+01	5.08228E+01	1.6923E+00	3.5528E+01	1.6418E+00	0.000E+00	7.531E-02
1.759961E+01	5.07150E+01	1.5106E+00	2.9665E+01	1.5165E+00	0.000E+00	7.045E-02
1.881398E+01	5.06025E+01	1.3455E+00	2.4718E+01	1.3992E+00	0.000E+00	6.590E-02
2.011215E+01	5.04806E+01	1.1969E+00	2.0568E+01	1.2895E+00	0.000E+00	6.165E-02
2.149988E+01	5.03444E+01	1.0614E+00	1.7062E+01	1.1874E+00	0.000E+00	5.767E-02
2.298338E+01	5.01845E+01	9.4120E-01	1.4154E+01	1.0925E+00	0.000E+00	5.395E-02
2.456923E+01	4.99872E+01	8.3540E-01	1.1752E+01	1.0045E+00	0.000E+00	5.046E-02
2.626450E+01	4.97185E+01	7.4215E-01	9.7664E+00	9.2310E-01	0.000E+00	4.721E-02
2.807676E+01	4.92783E+01	6.5316E-01	8.0405E+00	8.4801E-01	0.000E+00	4.416E-02
2.988138E+01	4.81193E+01	5.7836E-01	6.6897E+00	7.8329E-01	0.000E+00	4.149E-02
3.001405E+01	4.79024E+01	5.7340E-01	6.6030E+00	7.7888E-01	0.000E+00	4.131E-02
3.033874E+01	4.68668E+01	5.6152E-01	6.3970E+00	7.6827E-01	0.000E+00	4.087E-02
3.046071E+01	4.58623E+01	5.5716E-01	6.3219E+00	7.6435E-01	0.000E+00	4.070E-02
3.064366E+01	4.68879E+01	3.5145E+00	3.9640E+01	7.5853E-01	3.343E-01	4.046E-02
3.110102E+01	4.82676E+01	3.4275E+00	3.8091E+01	7.4434E-01	3.214E-01	3.987E-02
3.208502E+01	4.92519E+01	3.2520E+00	3.5031E+01	7.1537E-01	2.960E+01	3.864E-02
3.429889E+01	5.01312E+01	2.9110E+00	2.9334E+01	6.5715E-01	2.487E+01	3.615E-02

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
3.666551E+01	5.05777E+01	2.6076E+00	2.4581E+01	6.0388E-01	2.091E+01	3.381E-02
3.919543E+01	5.08571E+01	2.3365E+00	2.0604E+01	5.5523E-01	1.758E+01	3.163E-02
4.189992E+01	5.10451E+01	2.0865E+00	1.7212E+01	5.1087E-01	1.472E+01	2.959E-02
4.479101E+01	5.11700E+01	1.8611E+00	1.4361E+01	4.7049E-01	1.230E+01	2.768E-02
4.788159E+01	5.12536E+01	1.6592E+00	1.1977E+01	4.3380E-01	1.028E+01	2.589E-02
5.118542E+01	5.13083E+01	1.4786E+00	9.9840E+00	4.0050E-01	8.578E+00	2.422E-02
5.471721E+01	5.13425E+01	1.3173E+00	8.3210E+00	3.7032E-01	7.159E+00	2.266E-02
5.849270E+01	5.13619E+01	1.1735E+00	6.9344E+00	3.4299E-01	5.973E+00	2.120E-02
6.252870E+01	5.14029E+01	1.0438E+00	5.7698E+00	3.1826E-01	4.973E+00	1.983E-02
6.684318E+01	5.14014E+01	9.2605E-01	4.7884E+00	2.9592E-01	4.128E+00	1.855E-02
7.145536E+01	5.13932E+01	8.2164E-01	3.9743E+00	2.7573E-01	3.427E+00	1.735E-02
7.638578E+01	5.13809E+01	7.2906E-01	3.2989E+00	2.5749E-01	2.845E+00	1.623E-02
8.165640E+01	5.13667E+01	6.4593E-01	2.7340E+00	2.4102E-01	2.358E+00	1.518E-02
8.729069E+01	5.13491E+01	5.7023E-01	2.2578E+00	2.2615E-01	1.949E+00	1.420E-02
9.331374E+01	5.13295E+01	5.0344E-01	1.8647E+00	2.1270E-01	1.611E+00	1.329E-02
9.975239E+01	5.13089E+01	4.4450E-01	1.5401E+00	2.0054E-01	1.331E+00	1.243E-02
1.066353E+02	5.12882E+01	3.9249E-01	1.2722E+00	1.8953E-01	1.100E+00	1.163E-02
1.139931E+02	5.12677E+01	3.4659E-01	1.0509E+00	1.7955E-01	9.091E-01	1.088E-02
1.218587E+02	5.12478E+01	3.0608E-01	8.6813E-01	1.7048E-01	7.513E-01	1.017E-02
1.302669E+02	5.12287E+01	2.7032E-01	7.1721E-01	1.6222E-01	6.209E-01	9.518E-03
1.392553E+02	5.12105E+01	2.3871E-01	5.9248E-01	1.5468E-01	5.130E-01	8.903E-03
1.488640E+02	5.11933E+01	2.1081E-01	4.8945E-01	1.4778E-01	4.239E-01	8.329E-03
1.591356E+02	5.11771E+01	1.8617E-01	4.0436E-01	1.4144E-01	3.503E-01	7.791E-03
1.701159E+02	5.11620E+01	1.6443E-01	3.3407E-01	1.3560E-01	2.894E-01	7.288E-03
1.818539E+02	5.11479E+01	1.4523E-01	2.7602E-01	1.3020E-01	2.391E-01	6.818E-03
1.944018E+02	5.11348E+01	1.2828E-01	2.2807E-01	1.2518E-01	1.976E-01	6.378E-03
2.078156E+02	5.11228E+01	1.1331E-01	1.8846E-01	1.2050E-01	1.633E-01	5.966E-03
2.221548E+02	5.11116E+01	1.0010E-01	1.5573E-01	1.1612E-01	1.349E-01	5.581E-03
2.374835E+02	5.11014E+01	8.8426E-02	1.2869E-01	1.1199E-01	1.115E-01	5.221E-03
2.538699E+02	5.10920E+01	7.8119E-02	1.0635E-01	1.0810E-01	9.209E-02	4.884E-03
2.713869E+02	5.10834E+01	6.9017E-02	8.7897E-02	1.0441E-01	7.609E-02	4.569E-03
2.901126E+02	5.10755E+01	6.0977E-02	7.2646E-02	1.0089E-01	6.287E-02	4.274E-03
3.101304E+02	5.10683E+01	5.3876E-02	6.0043E-02	9.7530E-02	5.195E-02	3.998E-03
3.315294E+02	5.10617E+01	4.7604E-02	4.9629E-02	9.4308E-02	4.292E-02	3.740E-03
3.544049E+02	5.10558E+01	4.2063E-02	4.1022E-02	9.1209E-02	3.546E-02	3.498E-03
3.788588E+02	5.10503E+01	3.7169E-02	3.3909E-02	8.8219E-02	2.930E-02	3.273E-03
4.050001E+02	5.10454E+01	3.2845E-02	2.8030E-02	8.5328E-02	2.421E-02	3.061E-03
4.329451E+02	5.10409E+01	2.9025E-02	2.3172E-02	8.2525E-02	2.001E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 377

$Z = 52$

atomic weight = 1.276000E+02 g/mol, nominal density ρ (g/cm³) = 6.2300E+00

atomic number $Z = 52$, f_1 (e/atom) = μ (cm²/g) \times 2.11885E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.29783E+05

edges. Edge energies (keV):

K	3.18138E+00	L	I	4.93920E+00	L	II	4.61200E+00	L	III	4.34140E+00
M	1.00600E+00	M	II	8.69700E-00	M	III	8.18700E-00	M	IV	5.82500E-01
N	5.72100E-00	N	I	1.68300E-00	N	II	1.10200E-00	N	III	1.10200E-01
O	3.98000E-02	N	V	3.98000E-02						

relativistic correction estimate f_{rel} (H82,3/5CL) = -5.8644E-01, -3.6120E-01 e/atom

nuclear Thomson correction f_{NT} = -1.1625E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	5.02171E+00	0.0000E+00	0.0000E+00	9.1175E-05	0.000E+00	1.160E+02
1.142761E-02	4.95273E+00	0.0000E+00	0.0000E+00	1.2637E-04	0.000E+00	1.085E+02
1.221612E-02	4.87306E+00	0.0000E+00	0.0000E+00	1.7418E-04	0.000E+00	1.015E+02
1.305903E-02	4.78087E+00	0.0000E+00	0.0000E+00	2.3875E-04	0.000E+00	9.494E+01
1.396010E-02	4.67402E+00	0.0000E+00	0.0000E+00	3.2546E-04	0.000E+00	8.881E+01
1.492335E-02	4.54987E+00	0.0000E+00	0.0000E+00	4.4124E-04	0.000E+00	8.308E+01
1.595306E-02	4.40528E+00	0.0000E+00	0.0000E+00	5.9495E-04	0.000E+00	7.772E+01
1.705382E-02	4.23635E+00	0.0000E+00	0.0000E+00	7.9789E-04	0.000E+00	7.270E+01
1.823053E-02	4.03830E+00	0.0000E+00	0.0000E+00	1.0643E-03	0.000E+00	6.801E+01
1.948844E-02	3.80510E+00	0.0000E+00	0.0000E+00	1.4121E-03	0.000E+00	6.362E+01
2.083314E-02	3.52916E+00	0.0000E+00	0.0000E+00	1.8637E-03	0.000E+00	5.951E+01
2.227063E-02	3.20063E+00	0.0000E+00	0.0000E+00	2.4467E-03	0.000E+00	5.567E+01
2.380730E-02	2.80664E+00	0.0000E+00	0.0000E+00	3.1953E-03	0.000E+00	5.208E+01
2.545001E-02	2.32987E+00	0.0000E+00	0.0000E+00	4.1513E-03	0.000E+00	4.872E+01
2.720606E-02	1.74643E+00	0.0000E+00	0.0000E+00	5.3655E-03	0.000E+00	4.557E+01
2.908327E-02	1.02221E+00	0.0000E+00	0.0000E+00	6.8992E-03	0.000E+00	4.263E+01
3.109002E-02	1.06352E-01	0.0000E+00	0.0000E+00	8.8262E-03	0.000E+00	3.988E+01
3.323523E-02	-1.08165E+00	0.0000E+00	0.0000E+00	1.1234E-02	0.000E+00	3.731E+01
3.552846E-02	-2.68102E+00	0.0000E+00	0.0000E+00	1.4227E-02	0.000E+00	3.490E+01
3.797993E-02	-4.97638E+00	0.0000E+00	0.0000E+00	1.7928E-02	0.000E+00	3.264E+01
3.900400E-02	-6.23915E+00	0.0000E+00	0.0000E+00	1.9632E-02	0.000E+00	3.179E+01
3.960100E-02	-7.16454E+00	0.0000E+00	0.0000E+00	2.0670E-02	0.000E+00	3.131E+01
3.976020E-02	-7.53159E+00	0.0000E+00	0.0000E+00	2.0952E-02	0.000E+00	3.118E+01
3.999900E-02	-7.79861E+00	2.6938E-01	2.2210E+03	2.1379E-02	0.000E+00	3.100E+01
4.060054E-02	-8.69306E+00	3.9162E-01	3.1810E+03	2.2479E-02	0.000E+00	3.054E+01
4.340198E-02	-1.46624E+01	2.0857E+00	1.5848E+04	2.8047E-02	0.000E+00	2.857E+01
4.639671E-02	-2.27141E+01	9.0143E+00	6.4072E+04	3.4823E-02	0.000E+00	2.672E+01
4.959809E-02	-2.71819E+01	2.3696E+01	1.5756E+05	4.3026E-02	0.000E+00	2.500E+01
5.302035E-02	-2.11494E+01	4.1736E+01	2.5959E+05	5.2904E-02	0.000E+00	2.338E+01
5.667876E-02	-4.60076E+00	5.3777E+01	3.1290E+05	6.4738E-02	0.000E+00	2.187E+01
6.058959E-02	1.49668E+01	5.4618E+01	2.9728E+05	7.8843E-02	0.000E+00	2.046E+01
6.477028E-02	3.00555E+01	4.6556E+01	2.3704E+05	9.5567E-02	0.000E+00	1.914E+01
6.923942E-02	3.80387E+01	3.5090E+01	1.6713E+05	1.1530E-01	0.000E+00	1.791E+01
7.401695E-02	4.02145E+01	2.4414E+01	1.0878E+05	1.3845E-01	0.000E+00	1.675E+01
7.912411E-02	3.90346E+01	1.6236E+01	6.7671E+04	1.6548E-01	0.000E+00	1.567E+01
8.458368E-02	3.64569E+01	1.0612E+01	4.1375E+04	1.9689E-01	0.000E+00	1.466E+01
9.041995E-02	3.35946E+01	6.9660E+00	2.5407E+04	2.3319E-01	0.000E+00	1.371E+01
9.665893E-02	3.09241E+01	4.6687E+00	1.5929E+04	2.7493E-01	0.000E+00	1.283E+01
1.033284E-01	2.85341E+01	3.2331E+00	1.0319E+04	3.2269E-01	0.000E+00	1.200E+01
1.079960E-01	2.69218E+01	2.5916E+00	7.9139E+03	3.5791E-01	0.000E+00	1.148E+01
1.096490E-01	2.60467E+01	2.4126E+00	7.2562E+03	3.7072E-01	0.000E+00	1.131E+01
1.100898E-01	2.53687E+01	2.3683E+00	7.0946E+03	3.7417E-01	0.000E+00	1.126E+01
1.104581E-01	2.56020E+01	3.4710E+00	1.0363E+04	3.7705E-01	0.000E+00	1.122E+01
1.107510E-01	2.58166E+01	3.4406E+00	1.0245E+04	3.7936E-01	0.000E+00	1.119E+01
1.124040E-01	2.59837E+01	3.2799E+00	9.6231E+03	3.9245E-01	0.000E+00	1.103E+01
1.180797E-01	2.54097E+01	2.8411E+00	7.9347E+03	4.3863E-01	0.000E+00	1.050E+01
1.252272E-01	2.44131E+01	2.4261E+00	6.3384E+03	5.0803E-01	0.000E+00	9.822E+00
1.349368E-01	2.35329E+01	2.1678E+00	5.2980E+03	5.8584E-01	0.000E+00	9.188E+00
1.442475E-01	2.27549E+01	2.0151E+00	4.6093E+03	6.7265E-01	0.000E+00	8.595E+00
1.542005E-01	2.20521E+01	1.9390E+00	4.1469E+03	7.6901E-01	0.000E+00	8.040E+00
1.648404E-01	2.13284E+01	1.9170E+00	3.8351E+03	8.7544E-01	0.000E+00	7.521E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.649340E-01	2.13207E+01	1.9170E+00	3.8330E+03	8.7639E-01	0.000E+00	7.517E+00
1.674585E-01	2.10437E+01	1.9185E+00	3.7781E+03	9.0209E-01	0.000E+00	7.404E+00
1.681317E-01	2.08308E+01	1.9192E+00	3.7645E+03	9.0897E-01	0.000E+00	7.374E+00
1.691415E-01	2.09635E+01	2.2751E+00	4.4359E+03	9.1932E-01	0.000E+00	7.330E+00
1.716660E-01	2.10059E+01	2.2855E+00	4.3906E+03	9.4527E-01	0.000E+00	7.222E+00
1.762144E-01	2.09123E+01	2.3086E+00	4.3204E+03	9.9239E-01	0.000E+00	7.036E+00
1.883732E-01	2.05780E+01	2.3917E+00	4.1872E+03	1.1203E+00	0.000E+00	6.582E+00
2.013709E-01	2.02470E+01	2.5018E+00	4.0971E+03	1.2593E+00	0.000E+00	6.157E+00
2.152655E-01	1.99365E+01	2.6328E+00	4.0334E+03	1.4099E+00	0.000E+00	5.760E+00
2.301188E-01	1.96437E+01	2.7816E+00	3.9863E+03	1.5719E+00	0.000E+00	5.388E+00
2.459970E-01	1.93624E+01	2.9453E+00	3.9485E+03	1.7455E+00	0.000E+00	5.040E+00
2.629708E-01	1.90847E+01	3.1207E+00	3.9136E+03	1.9305E+00	0.000E+00	4.715E+00
2.811158E-01	1.88008E+01	3.3043E+00	3.8764E+03	2.1266E+00	0.000E+00	4.410E+00
3.005128E-01	1.84978E+01	3.4917E+00	3.8318E+03	2.3333E+00	0.000E+00	4.126E+00
3.212482E-01	1.81581E+01	3.6779E+00	3.7757E+03	2.5501E+00	0.000E+00	3.859E+00
3.434143E-01	1.77479E+01	3.8574E+00	3.7043E+03	2.7762E+00	0.000E+00	3.610E+00
3.671099E-01	1.72479E+01	4.0242E+00	3.6150E+03	3.0107E+00	0.000E+00	3.377E+00
3.924405E-01	1.65932E+01	4.1725E+00	3.5063E+03	3.2526E+00	0.000E+00	3.159E+00
4.195189E-01	1.56938E+01	4.2972E+00	3.3781E+03	3.5006E+00	0.000E+00	2.955E+00
4.484657E-01	1.43924E+01	4.3941E+00	3.2312E+03	3.7534E+00	0.000E+00	2.765E+00
4.794098E-01	1.23763E+01	4.4592E+00	3.0674E+03	4.0095E+00	0.000E+00	2.586E+00
5.124891E-01	8.87098E+00	4.4910E+00	2.8900E+03	4.2673E+00	0.000E+00	2.419E+00
5.478508E-01	7.87758E-01	4.4905E+00	2.7031E+03	4.5251E+00	0.000E+00	2.263E+00
5.606580E-01	-6.28018E+00	4.4830E+00	2.6369E+03	4.6141E+00	0.000E+00	2.211E+00
5.692395E-01	-1.87866E+01	4.4762E+00	2.5932E+03	4.6724E+00	0.000E+00	2.178E+00
5.708500E-01	-2.57911E+01	4.4748E+00	2.5851E+03	4.6833E+00	0.000E+00	2.172E+00
5.715279E-01	-3.22115E+01	4.4742E+00	2.5817E+03	4.6878E+00	0.000E+00	2.169E+00
5.749605E-01	-2.06063E+01	2.9296E+01	1.6804E+04	4.7108E+00	0.000E+00	2.156E+00
5.795875E-01	-1.71582E+01	2.8851E+01	1.6416E+04	4.7414E+00	0.000E+00	2.139E+00
5.819175E-01	-2.30368E+01	2.8631E+01	1.6226E+04	4.7568E+00	0.000E+00	2.131E+00
5.835420E-01	-1.84736E+01	4.4853E+01	2.5348E+04	4.7674E+00	0.000E+00	2.125E+00
5.856525E-01	-1.10295E+01	4.4528E+01	2.5074E+04	4.7812E+00	0.000E+00	2.117E+00
5.941500E-01	5.71545E-01	4.3258E+01	2.4011E+04	4.8361E+00	0.000E+00	2.087E+00
6.260625E-01	1.60555E+01	3.8960E+01	2.0522E+04	5.0337E+00	0.000E+00	1.980E+00
6.692609E-01	2.41327E+01	3.4422E+01	1.6961E+04	5.2807E+00	0.000E+00	1.853E+00
7.154399E-01	2.83771E+01	3.1032E+01	1.4304E+04	5.5203E+00	0.000E+00	1.733E+00
7.648052E-01	3.07857E+01	2.8276E+01	1.2193E+04	5.7508E+00	0.000E+00	1.621E+00
8.023260E-01	3.11006E+01	2.6502E+01	1.0893E+04	5.9095E+00	0.000E+00	1.545E+00
8.146065E-01	2.99606E+01	2.5969E+01	1.0513E+04	5.9586E+00	0.000E+00	1.522E+00
8.175768E-01	2.85887E+01	2.5843E+01	1.0424E+04	5.9702E+00	0.000E+00	1.516E+00
8.178813E-01	2.82393E+01	2.5831E+01	1.0415E+04	5.9714E+00	0.000E+00	1.516E+00
8.227935E-01	3.02193E+01	2.9191E+01	1.1700E+04	5.9905E+00	0.000E+00	1.507E+00
8.350740E-01	3.21210E+01	2.8686E+01	1.1328E+04	6.0373E+00	0.000E+00	1.485E+00
8.523060E-01	3.32176E+01	2.8006E+01	1.0836E+04	6.1007E+00	0.000E+00	1.455E+00
8.653515E-01	3.33477E+01	2.7511E+01	1.0484E+04	6.1470E+00	0.000E+00	1.433E+00
8.688303E-01	3.27617E+01	2.7381E+01	1.0393E+04	6.1591E+00	0.000E+00	1.427E+00
8.739896E-01	3.37989E+01	2.8707E+01	1.0832E+04	6.1769E+00	0.000E+00	1.419E+00
8.740485E-01	3.38085E+01	2.8705E+01	1.0831E+04	6.1771E+00	0.000E+00	1.419E+00
8.870940E-01	3.50964E+01	2.8239E+01	1.0498E+04	6.2211E+00	0.000E+00	1.398E+00
9.342948E-01	3.74949E+01	2.6663E+01	9.4113E+03	6.3692E+00	0.000E+00	1.327E+00
9.858800E-01	3.90244E+01	2.5112E+01	8.4003E+03	6.5125E+00	0.000E+00	1.258E+00
9.987612E-01	3.91176E+01	2.4759E+01	8.1753E+03	6.5455E+00	0.000E+00	1.241E+00
1.000970E+00	3.90626E+01	2.4694E+01	8.1358E+03	6.5510E+00	0.000E+00	1.239E+00
1.004994E+00	3.86076E+01	2.4564E+01	8.0604E+03	6.5610E+00	0.000E+00	1.234E+00
1.011030E+00	3.93620E+01	2.5499E+01	8.3174E+03	6.5759E+00	0.000E+00	1.226E+00
1.026120E+00	4.02800E+01	2.5017E+01	8.0401E+03	6.5120E+00	0.000E+00	1.208E+00
1.067676E+00	4.16539E+01	2.3768E+01	7.3415E+03	6.7044E+00	0.000E+00	1.161E+00
1.141345E+00	4.32237E+01	2.1817E+01	6.3038E+03	6.8447E+00	0.000E+00	1.086E+00
1.220098E+00	4.43693E+01	2.0028E+01	5.4135E+03	6.9653E+00	0.000E+00	1.016E+00
1.304285E+00	4.52519E+01	1.8393E+01	4.6505E+03	7.0653E+00	0.000E+00	9.506E-01
1.394281E+00	4.59578E+01	1.6880E+01	3.9924E+03	7.1440E+00	0.000E+00	8.892E-01
1.490486E+00	4.64985E+01	1.5440E+01	3.4161E+03	7.2009E+00	0.000E+00	8.318E-01
1.593329E+00	4.68807E+01	1.4101E+01	2.9186E+03	7.2358E+00	0.000E+00	7.781E-01
1.703269E+00	4.71403E+01	1.2882E+01	2.4941E+03	7.2486E+00	0.000E+00	7.279E-01
1.820795E+00	4.73202E+01	1.1773E+01	2.1323E+03	7.2393E+00	0.000E+00	6.809E-01

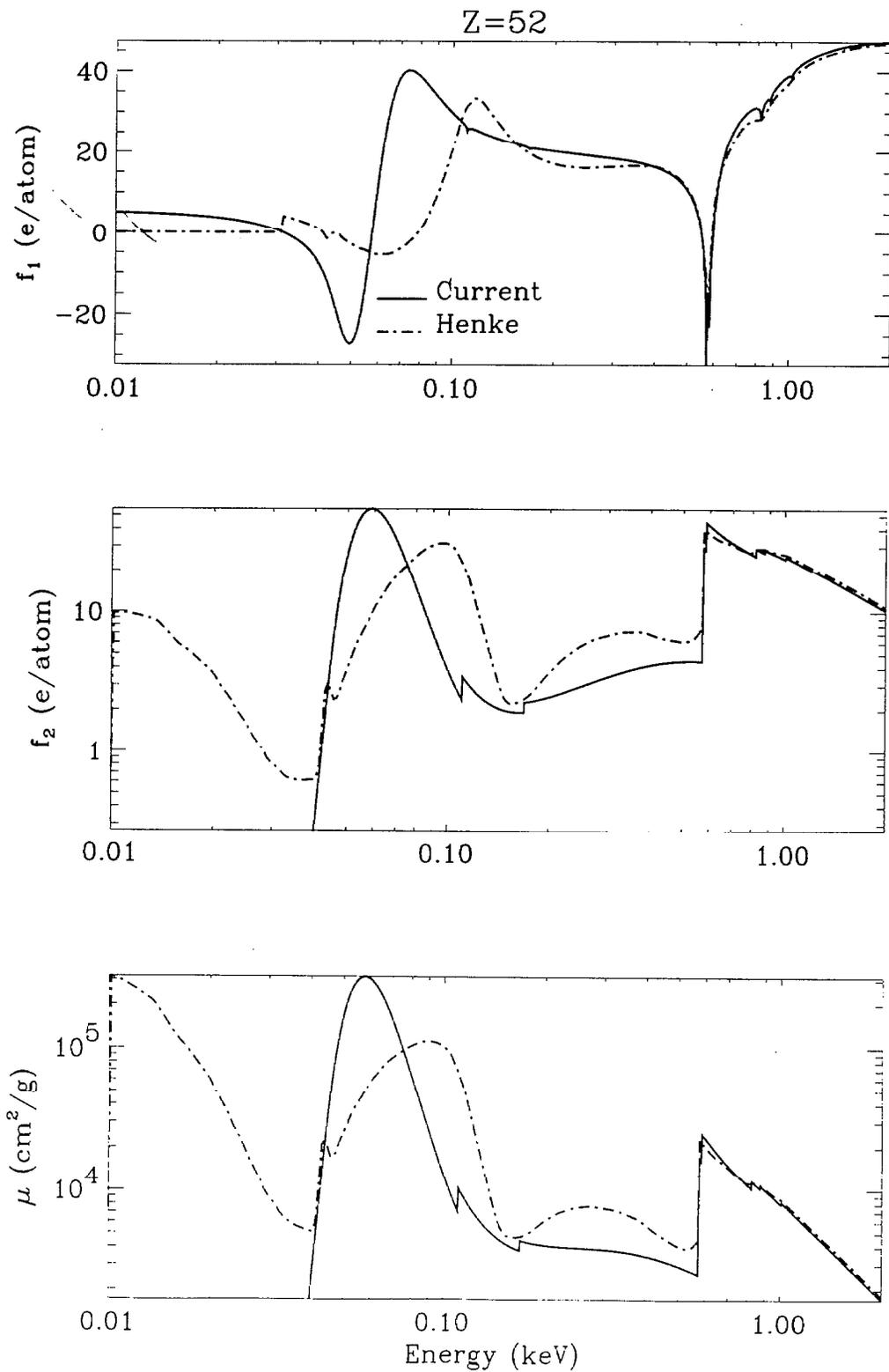
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 379

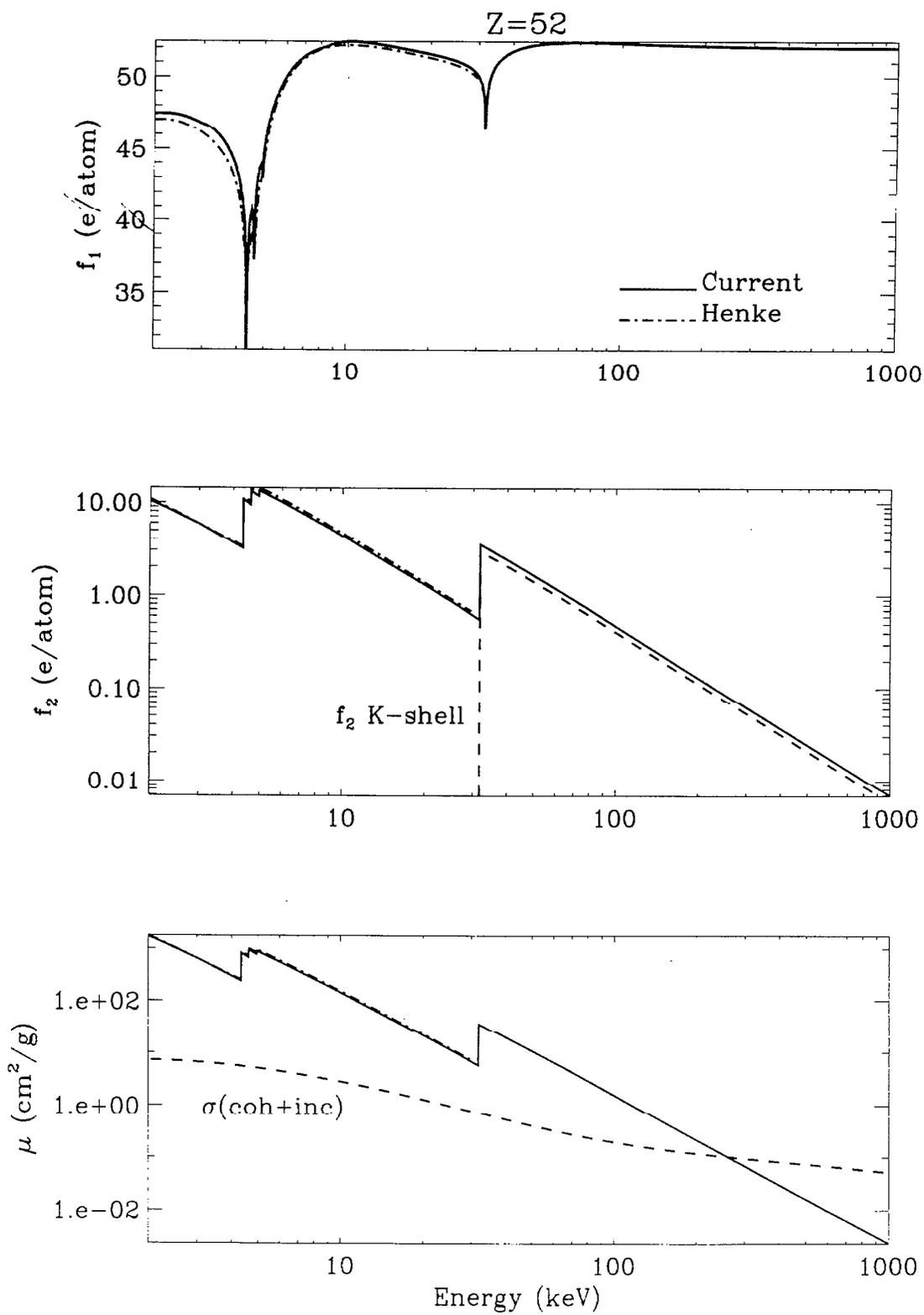
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.946430E+00	4.74163E+01	1.0766E+01	1.8240E+03	7.2084E+00	0.000E+00	6.370E-01
2.080733E+00	4.74762E+01	9.8467E+00	1.5606E+03	7.1564E+00	0.000E+00	5.959E-01
2.224304E+00	4.74681E+01	8.9995E+00	1.3343E+03	7.0840E+00	0.000E+00	5.574E-01
2.377781E+00	4.74141E+01	8.1995E+00	1.1372E+03	6.9921E+00	0.000E+00	5.214E-01
2.541848E+00	4.72925E+01	7.4470E+00	9.6618E+02	6.8816E+00	0.000E+00	4.878E-01
2.717235E+00	4.70977E+01	6.7743E+00	8.2217E+02	6.7538E+00	0.000E+00	4.563E-01
2.904724E+00	4.68476E+01	6.1722E+00	7.0075E+02	6.6100E+00	0.000E+00	4.268E-01
3.105150E+00	4.66153E+01	5.5748E+00	5.9207E+02	6.4514E+00	0.000E+00	3.993E-01
3.319406E+00	4.61977E+01	4.9906E+00	4.9582E+02	6.2796E+00	0.000E+00	3.735E-01
3.548445E+00	4.55660E+01	4.4525E+00	4.1380E+02	6.0961E+00	0.000E+00	3.494E-01
3.793288E+00	4.46074E+01	3.9705E+00	3.4519E+02	5.9024E+00	0.000E+00	3.269E-01
4.055024E+00	4.29161E+01	3.5466E+00	2.8844E+02	5.7001E+00	0.000E+00	3.058E-01
4.254572E+00	3.98866E+01	3.2731E+00	2.5370E+02	5.5499E+00	0.000E+00	2.914E-01
4.319693E+00	3.64828E+01	3.1916E+00	2.4366E+02	5.5017E+00	0.000E+00	2.870E-01
4.334821E+00	3.35784E+01	3.1737E+00	2.4141E+02	5.4906E+00	0.000E+00	2.860E-01
4.337059E+00	3.25661E+01	3.1704E+00	2.4108E+02	5.4889E+00	0.000E+00	2.859E-01
4.363107E+00	3.64143E+01	1.0730E+01	8.1100E+02	5.4699E+00	0.000E+00	2.842E-01
4.428228E+00	3.96387E+01	1.0375E+01	7.7263E+02	5.4224E+00	0.000E+00	2.800E-01
4.519760E+00	4.06986E+01	9.9045E+00	7.2268E+02	5.3565E+00	0.000E+00	2.743E-01
4.588940E+00	3.98588E+01	9.5928E+00	6.8938E+02	5.3073E+00	0.000E+00	2.702E-01
4.607388E+00	3.81010E+01	9.5193E+00	6.8137E+02	5.2942E+00	0.000E+00	2.691E-01
4.633924E+00	4.01981E+01	1.3189E+01	9.3861E+02	5.2755E+00	0.000E+00	2.676E-01
4.635060E+00	4.02695E+01	1.3182E+01	9.3792E+02	5.2747E+00	0.000E+00	2.675E-01
4.704240E+00	4.24355E+01	1.2795E+01	8.9696E+02	5.2264E+00	0.000E+00	2.636E-01
4.840416E+00	4.39010E+01	1.2099E+01	8.2431E+02	5.1327E+00	0.000E+00	2.561E-01
4.914504E+00	4.37836E+01	1.1775E+01	7.9017E+02	5.0826E+00	0.000E+00	2.523E-01
4.934261E+00	4.30070E+01	1.1693E+01	7.8149E+02	5.0694E+00	0.000E+00	2.513E-01
4.953664E+00	4.37620E+01	1.3446E+01	8.9514E+02	5.0564E+00	0.000E+00	2.503E-01
4.963896E+00	4.41527E+01	1.3402E+01	8.9036E+02	5.0496E+00	0.000E+00	2.498E-01
5.037984E+00	4.54697E+01	1.3093E+01	8.5704E+02	5.0005E+00	0.000E+00	2.461E-01
5.295467E+00	4.74921E+01	1.2143E+01	7.5622E+02	4.8346E+00	0.000E+00	2.341E-01
5.660855E+00	4.90633E+01	1.1024E+01	6.4224E+02	4.6115E+00	0.000E+00	2.190E-01
6.051453E+00	5.01223E+01	9.9599E+00	5.4278E+02	4.3884E+00	0.000E+00	2.049E-01
6.469004E+00	5.08541E+01	8.9652E+00	4.5704E+02	4.1666E+00	0.000E+00	1.917E-01
6.915365E+00	5.13603E+01	8.0533E+00	3.8405E+02	3.9470E+00	0.000E+00	1.793E-01
7.392525E+00	5.17086E+01	7.2315E+00	3.2260E+02	3.7309E+00	0.000E+00	1.677E-01
7.902609E+00	5.19470E+01	6.4957E+00	2.7107E+02	3.5190E+00	0.000E+00	1.569E-01
8.447890E+00	5.21110E+01	5.8397E+00	2.2797E+02	3.3122E+00	0.000E+00	1.468E-01
9.030794E+00	5.23131E+01	5.2387E+00	1.9131E+02	3.1111E+00	0.000E+00	1.373E-01
9.653919E+00	5.24118E+01	4.6582E+00	1.5913E+02	2.9166E+00	0.000E+00	1.284E-01
1.032004E+01	5.24525E+01	4.1358E+00	1.3216E+02	2.7289E+00	0.000E+00	1.201E-01
1.103212E+01	5.24176E+01	3.6712E+00	1.0974E+02	2.5486E+00	0.000E+00	1.124E-01
1.179334E+01	5.23573E+01	3.2610E+00	9.1188E+01	2.3759E+00	0.000E+00	1.051E-01
1.260708E+01	5.22804E+01	2.8992E+00	7.5838E+01	2.2112E+00	0.000E+00	9.834E-02
1.347697E+01	5.21929E+01	2.5799E+00	6.3130E+01	2.0544E+00	0.000E+00	9.200E-02
1.440688E+01	5.20983E+01	2.2978E+00	5.2599E+01	1.9059E+00	0.000E+00	8.606E-02
1.540095E+01	5.19993E+01	2.0485E-00	4.3864E+01	1.7654E+00	0.000E+00	8.050E-02
1.646362E+01	5.18967E+01	1.8263E-00	3.6583E+01	1.6331E+00	0.000E+00	7.531E-02
1.759961E+01	5.17907E+01	1.6292E+00	3.0528E+01	1.5088E+00	0.000E+00	7.045E-02
1.881398E+01	5.16814E+01	1.4547E+00	2.5499E+01	1.3922E+00	0.000E+00	6.590E-02
2.011215E+01	5.15662E+01	1.2957E+00	2.1246E+01	1.2833E+00	0.000E+00	6.165E-02
2.149988E+01	5.14406E+01	1.1532E+00	1.7689E+01	1.1818E+00	0.000E+00	5.767E-02
2.298338E+01	5.12980E+01	1.0224E+00	1.4670E+01	1.0875E+00	0.000E+00	5.395E-02
2.456923E+01	5.11280E+01	9.0723E-01	1.2177E+01	9.9993E-01	0.000E+00	5.046E-02
2.626450E+01	5.09118E+01	8.0574E-01	1.0117E+01	9.1896E-01	0.000E+00	4.721E-02
2.807676E+01	5.06606E+01	7.0918E-01	8.3299E+00	8.4421E-01	0.000E+00	4.416E-02
3.001405E+01	5.00202E+01	6.2270E-01	6.8420E+00	7.7536E-01	0.000E+00	4.131E-02
3.117752E+01	4.91381E+01	5.7843E-01	5.1184E+00	7.3862E-01	0.000E+00	3.977E-02
3.165473E+01	4.78928E+01	5.6169E-01	5.8517E+00	7.2444E-01	0.000E+00	3.917E-02
3.178199E+01	4.63982E+01	5.5735E-01	5.7833E+00	7.2075E-01	0.000E+00	3.901E-02
3.197287E+01	4.79119E+01	3.4947E+00	3.6046E+01	7.1526E-01	3.036E+01	3.878E-02
3.208502E+01	4.84330E+01	3.4746E+00	3.5714E+01	7.1207E-01	3.009E+01	3.864E-02
3.245008E+01	4.92809E+01	3.4107E+00	3.4662E+01	7.0187E-01	2.922E+01	3.821E-02
3.429889E+01	5.06702E+01	3.1135E+00	2.9937E+01	6.5403E-01	2.531E+01	3.615E-02
3.666551E+01	5.13278E+01	2.7886E+00	2.5082E+01	6.0089E-01	2.127E+01	3.381E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
3.919543E+01	5.16980E+01	2.4971E+00	2.1010E+01	5.5233E-01	1.787E+01	3.163E-02
4.189992E+01	5.19380E+01	2.2343E+00	1.7586E+01	5.0804E-01	1.500E+01	2.959E-02
4.479101E+01	5.20975E+01	1.9932E+00	1.4675E+01	4.6770E-01	1.254E+01	2.768E-02
4.788159E+01	5.22041E+01	1.7775E+00	1.2242E+01	4.3102E-01	1.048E+01	2.589E-02
5.118542E+01	5.22749E+01	1.5846E+00	1.0209E+01	3.9771E-01	8.750E+00	2.422E-02
5.471721E+01	5.23206E+01	1.4123E+00	8.5123E+00	3.6751E-01	7.305E+00	2.266E-02
5.849270E+01	5.23484E+01	1.2587E+00	7.0963E+00	3.4014E-01	6.097E+00	2.120E-02
6.252870E+01	5.23636E+01	1.1216E+00	5.9157E+00	3.1538E-01	5.088E+00	1.983E-02
6.684318E+01	5.24005E+01	9.9655E-01	4.9167E+00	2.9298E-01	4.230E+00	1.855E-02
7.145536E+01	5.23964E+01	8.8454E-01	4.0824E+00	2.7273E-01	3.513E+00	1.735E-02
7.638578E+01	5.23867E+01	7.8519E-01	3.3899E+00	2.5444E-01	2.917E+00	1.623E-02
8.165640E+01	5.23744E+01	6.9597E-01	2.8108E+00	2.3791E-01	2.419E+00	1.518E-02
8.729069E+01	5.23584E+01	6.1479E-01	2.3227E+00	2.2298E-01	2.000E+00	1.420E-02
9.331374E+01	5.23395E+01	5.4312E-01	1.9195E+00	2.0948E-01	1.654E+00	1.329E-02
9.975239E+01	5.23193E+01	4.7984E-01	1.5864E+00	1.9727E-01	1.367E+00	1.243E-02
1.066353E+02	5.22986E+01	4.2397E-01	1.3112E+00	1.8621E-01	1.131E+00	1.163E-02
1.139931E+02	5.22780E+01	3.7464E-01	1.0838E+00	1.7618E-01	9.347E-01	1.088E-02
1.218587E+02	5.22578E+01	3.3107E-01	8.9596E-01	1.6708E-01	7.728E-01	1.017E-02
1.302669E+02	5.22384E+01	2.9258E-01	7.4070E-01	1.5879E-01	6.390E-01	9.518E-03
1.392553E+02	5.22197E+01	2.5859E-01	6.1240E-01	1.5123E-01	5.283E-01	8.903E-03
1.488640E+02	5.22020E+01	2.2858E-01	5.0639E-01	1.4432E-01	4.368E-01	8.329E-03
1.591356E+02	5.21854E+01	2.0207E-01	4.1875E-01	1.3798E-01	3.612E-01	7.791E-03
1.701159E+02	5.21697E+01	1.7864E-01	3.4630E-01	1.3214E-01	2.987E-01	7.288E-03
1.818539E+02	5.21552E+01	1.5794E-01	2.8641E-01	1.2675E-01	2.469E-01	6.818E-03
1.944018E+02	5.21416E+01	1.3964E-01	2.3689E-01	1.2176E-01	2.042E-01	6.378E-03
2.078156E+02	5.21291E+01	1.2347E-01	1.9594E-01	1.1711E-01	1.688E-01	5.966E-03
2.221548E+02	5.21175E+01	1.0918E-01	1.6208E-01	1.1277E-01	1.396E-01	5.581E-03
2.374835E+02	5.21068E+01	9.6550E-02	1.3407E-01	1.0869E-01	1.154E-01	5.221E-03
2.538699E+02	5.20970E+01	8.5384E-02	1.1092E-01	1.0485E-01	9.545E-02	4.884E-03
2.713869E+02	5.20880E+01	7.5514E-02	9.1763E-02	1.0122E-01	7.892E-02	4.569E-03
2.901126E+02	5.20797E+01	6.6788E-02	7.5921E-02	9.7779E-02	6.526E-02	4.274E-03
3.101304E+02	5.20722E+01	5.9073E-02	6.2817E-02	9.4497E-02	5.396E-02	3.998E-03
3.315294E+02	5.20653E+01	5.2252E-02	5.1977E-02	9.1360E-02	4.462E-02	3.740E-03
3.544049E+02	5.20590E+01	4.6221E-02	4.3010E-02	8.8353E-02	3.689E-02	3.498E-03
3.788588E+02	5.20533E+01	4.0888E-02	3.5591E-02	8.5460E-02	3.050E-02	3.273E-03
4.050001E+02	5.20481E+01	3.6171E-02	2.9454E-02	8.2671E-02	2.522E-02	3.061E-03
4.329451E+02	5.20434E+01	3.2001E-02	2.4376E-02	7.9976E-02	2.086E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 383

Z = 53

Atomic weight = 1.269045E+02 g/mol, nominal density ρ (g/cm³) = 4.9200E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.10730E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.31590E+05

Edges. Edge energies (keV):

K		3.31694E+00	L	I	5.18810E+00	L	II	4.85210E+00	L	III	4.55710E+00
M	I	1.07210E+00	M	II	9.30500E-00	M	III	8.74600E-00	M	IV	6.31300E-01
N	V	6.19400E-00	N	I	1.86400E-00	N	II	1.22700E-00	N	III	1.22700E-01
N	IV	4.96000E-02	N	V	4.96000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -6.1537E-01, -3.7860E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.2143E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.18518E+01	0.0000E+00	0.0000E+00	1.0672E-04	0.000E+00	1.160E+02
1.142761E-02	1.18252E+01	0.0000E+00	0.0000E+00	1.4743E-04	0.000E+00	1.085E+02
1.221612E-02	1.17946E+01	0.0000E+00	0.0000E+00	2.0255E-04	0.000E+00	1.015E+02
1.305903E-02	1.17594E+01	0.0000E+00	0.0000E+00	2.7674E-04	0.000E+00	9.494E+01
1.396010E-02	1.17188E+01	0.0000E+00	0.0000E+00	3.7607E-04	0.000E+00	8.881E+01
1.492335E-02	1.16719E+01	0.0000E+00	0.0000E+00	5.0827E-04	0.000E+00	8.308E+01
1.595306E-02	1.16177E+01	0.0000E+00	0.0000E+00	6.8327E-04	0.000E+00	7.772E+01
1.705382E-02	1.15549E+01	0.0000E+00	0.0000E+00	9.1362E-04	0.000E+00	7.270E+01
1.823053E-02	1.14821E+01	0.0000E+00	0.0000E+00	1.2151E-03	0.000E+00	6.801E+01
1.948844E-02	1.13973E+01	0.0000E+00	0.0000E+00	1.6077E-03	0.000E+00	6.362E+01
2.083314E-02	1.12983E+01	0.0000E+00	0.0000E+00	2.1158E-03	0.000E+00	5.951E+01
2.227063E-02	1.11823E+01	0.0000E+00	0.0000E+00	2.7701E-03	0.000E+00	5.567E+01
2.380730E-02	1.10460E+01	0.0000E+00	0.0000E+00	3.6080E-03	0.000E+00	5.208E+01
2.545001E-02	1.08849E+01	0.0000E+00	0.0000E+00	4.6752E-03	0.000E+00	4.872E+01
2.720606E-02	1.06935E+01	0.0000E+00	0.0000E+00	6.0271E-03	0.000E+00	4.557E+01
2.908327E-02	1.04643E+01	0.0000E+00	0.0000E+00	7.7306E-03	0.000E+00	4.263E+01
3.109002E-02	1.01874E+01	0.0000E+00	0.0000E+00	9.8654E-03	0.000E+00	3.988E+01
3.323523E-02	9.84922E+00	0.0000E+00	0.0000E+00	1.2527E-02	0.000E+00	3.731E+01
3.552846E-02	9.43029E+00	0.0000E+00	0.0000E+00	1.5827E-02	0.000E+00	3.490E+01
3.797993E-02	8.90135E+00	0.0000E+00	0.0000E+00	1.9898E-02	0.000E+00	3.264E+01
4.060054E-02	8.21570E+00	0.0000E+00	0.0000E+00	2.4893E-02	0.000E+00	3.054E+01
4.340198E-02	7.29092E+00	0.0000E+00	0.0000E+00	3.0991E-02	0.000E+00	2.857E+01
4.639671E-02	5.95148E+00	0.0000E+00	0.0000E+00	3.8395E-02	0.000E+00	2.672E+01
4.860800E-02	4.48414E+00	0.0000E+00	0.0000E+00	4.4459E-02	0.000E+00	2.551E+01
4.935200E-02	3.67328E+00	0.0000E+00	0.0000E+00	4.6614E-02	0.000E+00	2.512E+01
4.959809E-02	2.55839E+00	0.0000E+00	0.0000E+00	4.7340E-02	0.000E+00	2.500E+01
4.984800E-02	3.20612E+00	6.2754E-01	4.1744E+03	4.8083E-02	0.000E+00	2.487E+01
5.059200E-02	2.78632E+00	8.1817E-01	5.3625E+03	5.0335E-02	0.000E+00	2.451E+01
5.302035E-02	6.05141E-01	1.8942E+00	1.1846E+04	5.8090E-02	0.000E+00	2.338E+01
5.667875E-02	-2.97990E+00	5.8610E+00	3.4289E+04	7.0942E-02	0.000E+00	2.187E+01
6.058959E-02	-4.41342E+00	1.2865E+01	7.0404E+04	8.6231E-02	0.000E+00	2.046E+01
6.477028E-02	-1.57643E+00	2.0756E+01	1.0626E+05	1.0432E-01	0.000E+00	1.914E+01
6.923942E-02	5.22924E+00	2.6340E+01	1.2614E+05	1.2563E-01	0.000E+00	1.791E+01
7.401695E-02	1.35284E+01	2.7841E+01	1.2473E+05	1.5058E-01	0.000E+00	1.675E+01
7.912411E-02	2.07455E+01	2.5717E+01	1.0777E+05	1.7967E-01	0.000E+00	1.567E+01
8.458368E-02	2.56007E+01	2.1603E+01	8.4689E+04	2.1340E-01	0.000E+00	1.466E+01
9.041995E-02	2.80894E+01	1.7050E+01	6.2528E+04	2.5232E-01	0.000E+00	1.371E+01
9.665893E-02	2.88251E+01	1.2982E+01	4.4535E+04	2.9701E-01	0.000E+00	1.283E+01
1.033284E-01	2.84904E+01	9.7369E+00	3.1247E+04	3.4805E-01	0.000E+00	1.200E+01
1.104581E-01	2.75842E+01	7.3115E+00	2.1949E+04	4.0607E-01	0.000E+00	1.122E+01
1.180797E-01	2.63152E+01	5.5642E+00	1.5625E+04	4.7168E-01	0.000E+00	1.050E+01
1.202460E-01	2.58390E+01	5.1835E+00	1.4294E+04	4.9096E-01	0.000E+00	1.031E+01
1.220865E-01	2.51550E+01	4.8922E+00	1.3287E+04	5.0755E-01	0.000E+00	1.016E+01
1.225773E-01	2.45579E+01	4.8191E+00	1.3036E+04	5.1200E-01	0.000E+00	1.011E+01
1.233135E-01	2.50124E-01	5.7654E+00	1.5503E+04	5.1870E-01	0.000E+00	1.005E+01
1.251540E-01	2.52665E+01	5.5146E+00	1.4611E+04	5.3559E-01	0.000E+00	9.907E+00
1.262272E-01	2.52677E+01	5.3788E+00	1.4130E+04	5.4552E-01	0.000E+00	9.822E+00
1.349368E-01	2.47795E+01	4.5057E+00	1.1072E+04	6.2819E-01	0.000E+00	9.188E+00
1.442475E-01	2.41393E+01	3.9032E+00	8.9726E+03	7.2030E-01	0.000E+00	8.595E+00
1.542005E-01	2.35207E+01	3.5000E+00	7.5264E+03	8.2240E-01	0.000E+00	8.040E+00
1.648404E-01	2.29449E+01	3.2395E+00	6.5166E+03	9.3502E-01	0.000E+00	7.521E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.762144E-01	2.23849E+01	3.0832E+00	5.8018E+03	1.0586E+00	0.000E+00	7.036E+00
1.826720E-01	2.20302E+01	3.0324E+00	5.5045E+03	1.1300E+00	0.000E+00	6.787E+00
1.854680E-01	2.17663E+01	3.0170E+00	5.3939E+03	1.1611E+00	0.000E+00	6.685E+00
1.862136E-01	2.15453E+01	3.0134E+00	5.3660E+03	1.1694E+00	0.000E+00	6.658E+00
1.873320E-01	2.17026E+01	3.3918E+00	6.0037E+03	1.1819E+00	0.000E+00	6.618E+00
1.883732E-01	2.17597E+01	3.3898E+00	5.9670E+03	1.1936E+00	0.000E+00	6.582E+00
1.901280E-01	2.17817E+01	3.3874E+00	5.9078E+03	1.2133E+00	0.000E+00	6.521E+00
2.013709E-01	2.16355E+01	3.3965E+00	5.5930E+03	1.3402E+00	0.000E+00	6.157E+00
2.152655E-01	2.13975E+01	3.4508E+00	5.3155E+03	1.4987E+00	0.000E+00	5.760E+00
2.301188E-01	2.11701E+01	3.5381E+00	5.0982E+03	1.6692E+00	0.000E+00	5.388E+00
2.459970E-01	2.09590E+01	3.6501E+00	4.9201E+03	1.8516E+00	0.000E+00	5.040E+00
2.629708E-01	2.07604E+01	3.7800E+00	4.7663E+03	2.0458E+00	0.000E+00	4.715E+00
2.811158E-01	2.05671E+01	3.9218E+00	4.6260E+03	2.2514E+00	0.000E+00	4.410E+00
3.003128E-01	2.03694E+01	4.0698E+00	4.4907E+03	2.4679E+00	0.000E+00	4.126E+00
3.212482E-01	2.01545E+01	4.2182E+00	4.3540E+03	2.6948E+00	0.000E+00	3.859E+00
3.434143E-01	1.99050E+01	4.3612E+00	4.2111E+03	2.9312E+00	0.000E+00	3.610E+00
3.671099E-01	1.95966E+01	4.4930E+00	4.0583E+03	3.1762E+00	0.000E+00	3.377E+00
3.924405E-01	1.91897E+01	4.6080E+00	3.8915E+03	3.4287E+00	0.000E+00	3.159E+00
4.195189E-01	1.86426E+01	4.7012E+00	3.7159E+03	3.6873E+00	0.000E+00	2.955E+00
4.484657E-01	1.78709E+01	4.7685E+00	3.5258E+03	3.9508E+00	0.000E+00	2.765E+00
4.794098E-01	1.67376E+01	4.8069E+00	3.3247E+03	4.2174E+00	0.000E+00	2.586E+00
5.124891E-01	1.49816E+01	4.8143E+00	3.1149E+03	4.4856E+00	0.000E+00	2.419E+00
5.478508E-01	1.19899E+01	4.7894E+00	2.8988E+03	4.7536E+00	0.000E+00	2.263E+00
5.856525E-01	5.63492E+00	4.7339E+00	2.6803E+03	5.0196E+00	0.000E+00	2.117E+00
6.070120E-01	-3.38493E+00	4.6924E+00	2.5633E+03	5.1609E+00	0.000E+00	2.043E+00
6.163030E-01	-1.53534E+00	4.6724E+00	2.5139E+03	5.2204E+00	0.000E+00	2.012E+00
6.186740E-01	-2.69803E+01	4.6672E+00	2.5015E+03	5.2354E+00	0.000E+00	2.004E+00
6.187806E-01	-2.82232E+01	4.6670E+00	2.5009E+03	5.2361E+00	0.000E+00	2.004E+00
6.224970E-01	-1.69818E+00	2.8524E+01	1.5194E+04	5.2595E+00	0.000E+00	1.992E+00
6.260625E-01	-1.32224E+01	2.8226E+01	1.4950E+04	5.2817E+00	0.000E+00	1.980E+00
6.281435E-01	-1.34083E+01	2.8054E+01	1.4809E+04	5.2946E+00	0.000E+00	1.974E+00
6.306687E-01	-1.92036E+01	2.7848E+01	1.4642E+04	5.3102E+00	0.000E+00	1.966E+00
6.317880E-01	-1.95875E+01	4.3524E+01	2.2843E+04	5.3170E+00	0.000E+00	1.962E+00
6.344565E-01	-8.36804E+00	4.3172E+01	2.2563E+04	5.3334E+00	0.000E+00	1.954E+00
6.439260E-01	3.18632E+00	4.1956E+01	2.1605E+04	5.3905E+00	0.000E+00	1.925E+00
6.692609E-01	1.53340E+01	3.8956E+01	1.9301E+04	5.5379E+00	0.000E+00	1.853E+00
7.154399E-01	2.45449E+01	3.4443E+01	1.5964E+04	5.7863E+00	0.000E+00	1.733E+00
7.648052E-01	2.91643E+01	3.0997E+01	1.3439E+04	6.0250E+00	0.000E+00	1.621E+00
8.175768E-01	3.17254E+01	2.8202E+01	1.1438E+04	6.2521E+00	0.000E+00	1.516E+00
8.571080E-01	3.20836E+01	2.6462E+01	1.0237E+04	6.4048E+00	0.000E+00	1.447E+00
8.702270E-01	3.09430E+01	2.5931E+01	9.8809E+03	6.4524E+00	0.000E+00	1.425E+00
8.739896E-01	2.87963E+01	2.5783E+01	9.7821E+03	6.4658E+00	0.000E+00	1.419E+00
8.789730E-01	3.12151E+01	2.9204E+01	1.1017E+04	6.4833E+00	0.000E+00	1.411E+00
8.920920E-01	3.31591E+01	2.8702E+01	1.0669E+04	6.5285E+00	0.000E+00	1.390E+00
9.118900E-01	3.43584E+01	2.7977E+01	1.0173E+04	6.5940E+00	0.000E+00	1.360E+00
9.258475E-01	3.44902E+01	2.7486E+01	9.8440E+03	6.6383E+00	0.000E+00	1.339E+00
9.295695E-01	3.39013E+01	2.7358E+01	9.7589E+03	6.6499E+00	0.000E+00	1.334E+00
9.342948E-01	3.48163E+01	2.8719E+01	1.0193E+04	6.6644E+00	0.000E+00	1.327E+00
9.351525E-01	3.49563E+01	2.8690E+01	1.0173E+04	6.6670E+00	0.000E+00	1.326E+00
9.491100E-01	3.62578E+01	2.8218E+01	9.8585E+03	6.7089E+00	0.000E+00	1.306E+00
9.987612E-01	3.86538E+01	2.6646E+01	8.8465E+03	6.8464E+00	0.000E+00	1.241E+00
1.050658E+00	4.01104E+01	2.5110E+01	7.9249E+03	6.9725E+00	0.000E+00	1.180E+00
1.067676E+00	4.00667E+01	2.4603E+01	7.6410E+03	7.0102E+00	0.000E+00	1.161E+00
1.071028E+00	3.96513E+01	2.4500E+01	7.3852E+03	7.0174E+00	0.000E+00	1.158E+00
1.077461E+00	4.04143E+01	2.5442E+01	7.8298E+03	7.0311E+00	0.000E+00	1.151E+00
1.093542E+00	4.13447E+01	2.4955E+01	7.5669E+03	7.0643E+00	0.000E+00	1.134E+00
1.141345E+00	4.28266E+01	2.3600E+01	6.8564E+03	7.1547E+00	0.000E+00	1.086E+00
1.220098E+00	4.43871E+01	2.1641E+01	5.8814E+03	7.2786E+00	0.000E+00	1.016E+00
1.304285E+00	4.55247E+01	1.9848E+01	5.0460E+03	7.3812E+00	0.000E+00	9.506E-01
1.394281E+00	4.63982E+01	1.8211E+01	4.3310E+03	7.4616E+00	0.000E+00	8.892E-01
1.490486E+00	4.70925E+01	1.6699E+01	3.7149E+03	7.5194E+00	0.000E+00	8.318E-01
1.593329E+00	4.76210E+01	1.5264E+01	3.1766E+03	7.5544E+00	0.000E+00	7.781E-01
1.703269E+00	4.79930E+01	1.3933E+01	2.7126E+03	7.5664E+00	0.000E+00	7.279E-01
1.820795E+00	4.82438E+01	1.2723E+01	2.3170E+03	7.5557E+00	0.000E+00	6.809E-01
1.946430E+00	4.84003E+01	1.1623E+01	1.9801E+03	7.5225E+00	0.000E+00	6.370E-01

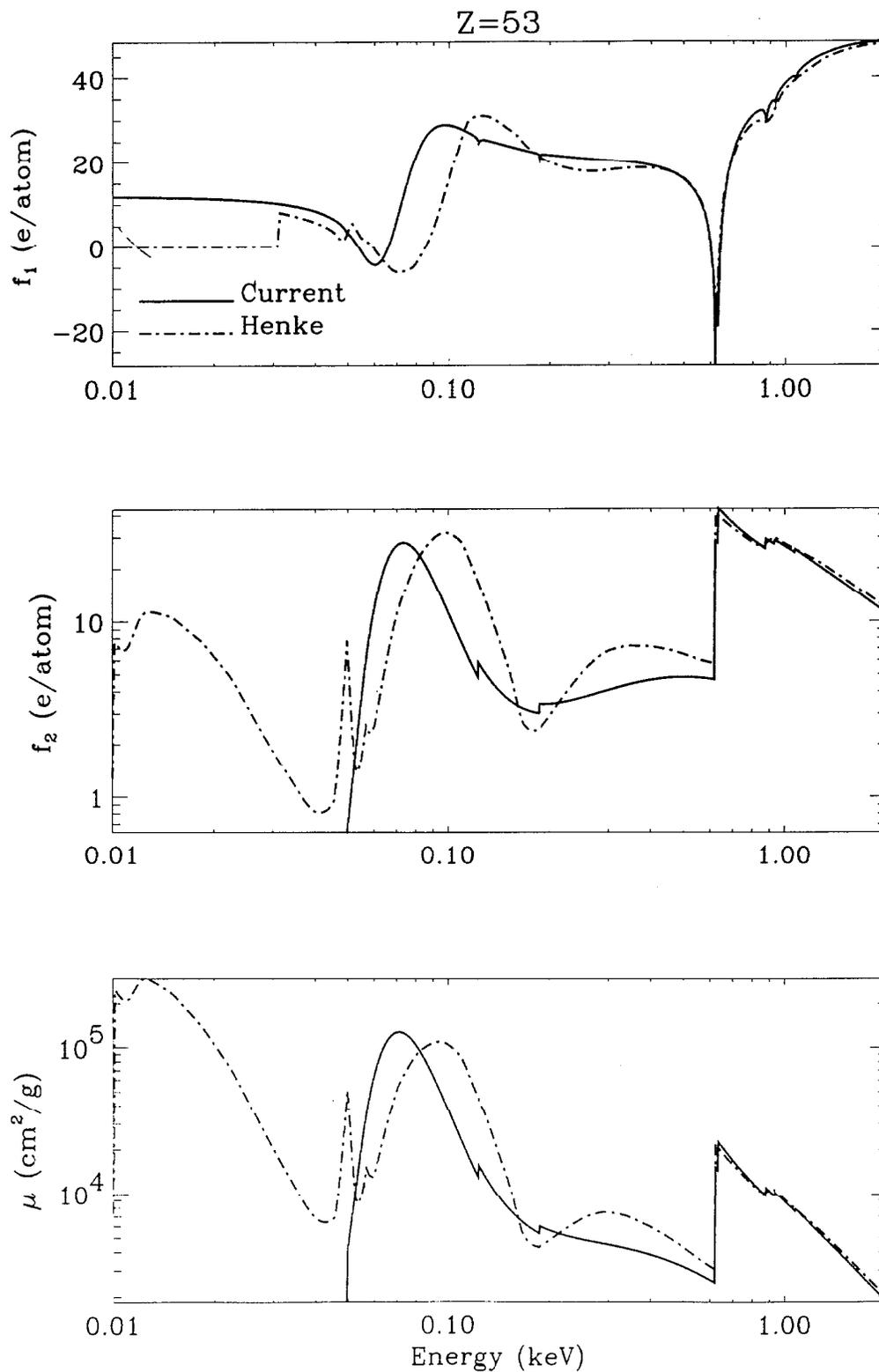
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 385

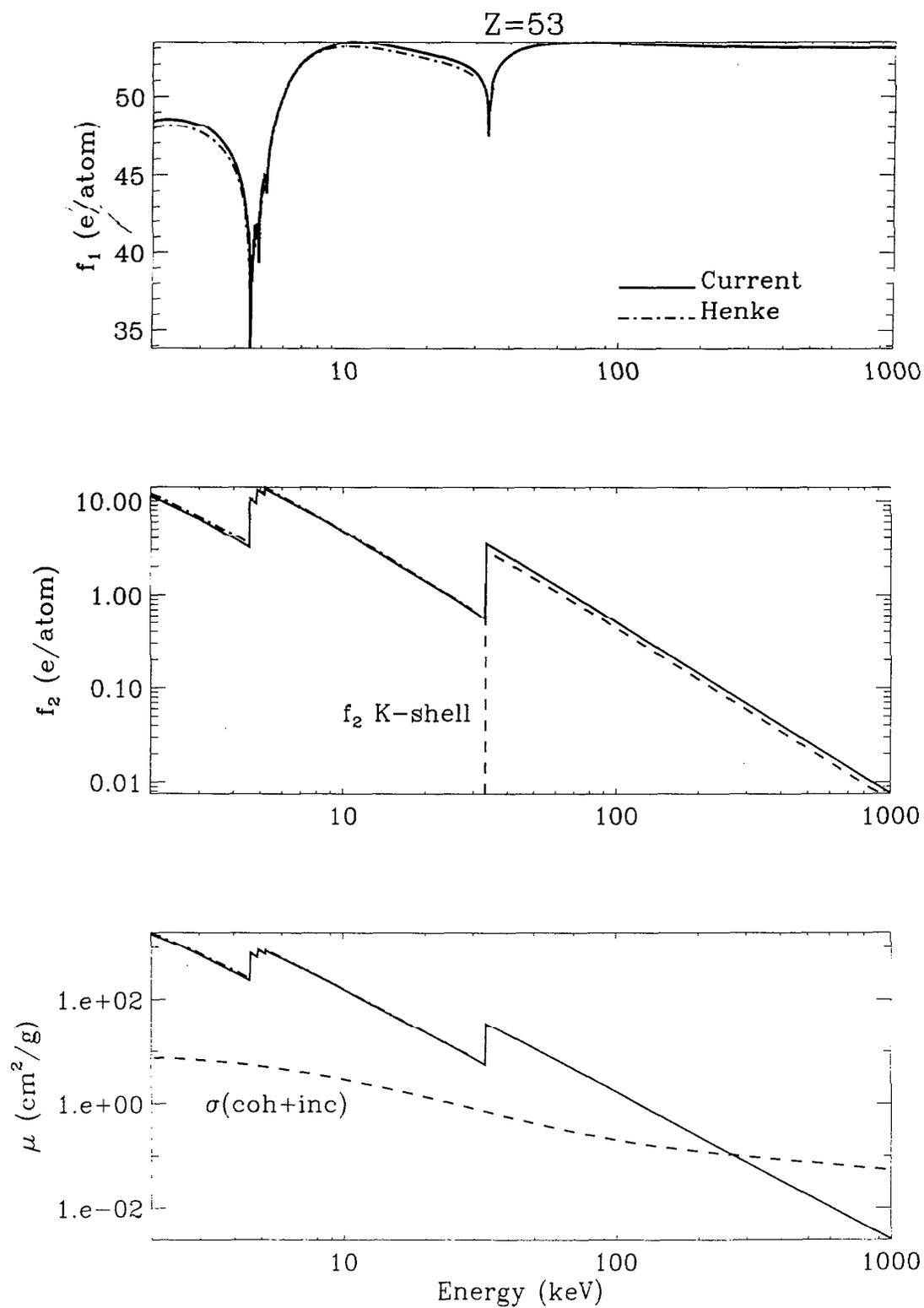
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _r cm ² /g	λ nm
2.080733E+00	4.84890E+01	1.0626E+01	1.6933E+03	7.4674E+00	0.000E+00	5.959E-01
2.224304E+00	4.85412E+01	9.7173E+00	1.4486E+03	7.3912E+00	0.000E+00	5.574E-01
2.377781E+00	4.85293E+01	8.8857E+00	1.2391E+03	7.2948E+00	0.000E+00	5.214E-01
2.541848E+00	4.84780E+01	8.1102E+00	1.0580E+03	7.1792E+00	0.000E+00	4.878E-01
2.717235E+00	4.83604E+01	7.3706E+00	8.9945E+02	7.0457E+00	0.000E+00	4.563E-01
2.904724E+00	4.82078E+01	6.7093E+00	7.6590E+02	6.8956E+00	0.000E+00	4.268E-01
3.105150E+00	4.80650E+01	6.0553E+00	6.4662E+02	6.7303E+00	0.000E+00	3.993E-01
3.319406E+00	4.78838E+01	5.4240E+00	5.4183E+02	6.5512E+00	0.000E+00	3.735E-01
3.548445E+00	4.77116E+01	4.8629E+00	4.5443E+02	6.3600E+00	0.000E+00	3.494E-01
3.793288E+00	4.64591E+01	4.3446E+00	3.7979E+02	6.1583E+00	0.000E+00	3.269E-01
4.055024E+00	4.53714E+01	3.8793E+00	3.1722E+02	5.9476E+00	0.000E+00	3.058E-01
4.334821E+00	4.32826E+01	3.4694E+00	2.6539E+02	5.7295E+00	0.000E+00	2.860E-01
4.65958E+00	4.10615E+01	3.3023E+00	2.4519E+02	5.6302E+00	0.000E+00	2.776E-01
4.534314E+00	3.77027E+01	3.2206E+00	2.3552E+02	5.5791E+00	0.000E+00	2.734E-01
4.552543E+00	3.38351E+01	3.1994E+00	2.3303E+02	5.5656E+00	0.000E+00	2.723E-01
4.579885E+00	3.76379E+01	1.0667E+01	7.7232E+02	5.5434E+00	0.000E+00	2.707E-01
4.633924E+00	4.04735E+01	1.0391E+01	7.4358E+02	5.5057E+00	0.000E+00	2.676E-01
4.648242E+00	4.08360E+01	1.0320E+01	7.3621E+02	5.4952E+00	0.000E+00	2.667E-01
4.755058E+00	4.19574E+01	9.8092E+00	6.8404E+02	5.4179E+00	0.000E+00	2.607E-01
4.827839E+00	4.10845E+01	9.5109E+00	6.5324E+02	5.3660E+00	0.000E+00	2.568E-01
4.847248E+00	3.93389E+01	9.4389E+00	6.4570E+02	5.3522E+00	0.000E+00	2.558E-01
4.876360E+00	4.14727E+01	1.3062E+01	8.8821E+02	5.3317E+00	0.000E+00	2.543E-01
4.953664E+00	4.36693E+01	1.2660E+01	8.4742E+02	5.2776E+00	0.000E+00	2.503E-01
5.084338E+00	4.49619E+01	1.2036E+01	7.8494E+02	5.1878E+00	0.000E+00	2.439E-01
5.162159E+00	4.48502E+01	1.1713E+01	7.5239E+02	5.1352E+00	0.000E+00	2.402E-01
5.182912E+00	4.40786E+01	1.1631E+01	7.4414E+02	5.1213E+00	0.000E+00	2.392E-01
5.214040E+00	4.52183E+01	1.3332E+01	8.4783E+02	5.1005E+00	0.000E+00	2.378E-01
5.295467E+00	4.65711E+01	1.3013E+01	8.1485E+02	5.0467E+00	0.000E+00	2.341E-01
5.660855E+00	4.90314E+01	1.1779E+01	6.8997E+02	4.8145E+00	0.000E+00	2.190E-01
6.051453E+00	5.04303E+01	1.0679E+01	5.8514E+02	4.5823E+00	0.000E+00	2.049E-01
6.469004E+00	5.13802E+01	9.6346E+00	4.9385E+02	4.3513E+00	0.000E+00	1.917E-01
6.915365E+00	5.20355E+01	8.6656E+00	4.1552E+02	4.1228E+00	0.000E+00	1.793E-01
7.392525E+00	5.24876E+01	7.7844E+00	3.4917E+02	3.8977E+00	0.000E+00	1.677E-01
7.902609E+00	5.27994E+01	6.9929E+00	2.9342E+02	3.6769E+00	0.000E+00	1.569E-01
8.447890E+00	5.30150E+01	6.2859E+00	2.4673E+02	3.4615E+00	0.000E+00	1.468E-01
9.030794E+00	5.31826E+01	5.6458E+00	2.0730E+02	3.2521E+00	0.000E+00	1.373E-01
9.653919E+00	5.33587E+01	5.0279E+00	1.7270E+02	3.0493E+00	0.000E+00	1.284E-01
1.032004E+01	5.34298E+01	4.4712E+00	1.4366E+02	2.8536E+00	0.000E+00	1.201E-01
1.103212E+01	5.34524E+01	3.9684E+00	1.1928E+02	2.6656E+00	0.000E+00	1.124E-01
1.179334E+01	5.34062E+01	3.5241E+00	9.9085E+01	2.4855E+00	0.000E+00	1.051E-01
1.260708E+01	5.33387E+01	3.1314E+00	8.2363E+01	2.3136E+00	0.000E+00	9.834E-02
1.347697E+01	5.32571E+01	2.7850E+00	6.8524E+01	2.1501E+00	0.000E+00	9.200E-02
1.440688E+01	5.31664E+01	2.4792E+00	5.7062E+01	1.9950E+00	0.000E+00	8.606E-02
1.540095E+01	5.30697E+01	2.2090E+00	4.7560E+01	1.8484E+00	0.000E+00	8.050E-02
1.646362E+01	5.29691E+01	1.9699E+00	3.9676E+01	1.7101E+00	0.000E+00	7.531E-02
1.759961E+01	5.28653E+01	1.7569E+00	3.3102E+01	1.5801E+00	0.000E+00	7.045E-02
1.881398E+01	5.27582E+01	1.5678E+00	2.7632E+01	1.4583E+00	0.000E+00	6.590E-02
2.011215E+01	5.26473E+01	1.3991E+00	2.3067E+01	1.3444E+00	0.000E+00	6.165E-02
2.149988E+01	5.25289E+01	1.2463E+00	1.9222E+01	1.2382E+00	0.000E+00	5.767E-02
2.298338E+01	5.23987E+01	1.1086E+00	1.5995E+01	1.1395E+00	0.000E+00	5.395E-02
2.456923E+01	5.22486E+01	9.8355E-01	1.3274E+01	1.0478E+00	0.000E+00	5.046E-02
2.626450E+01	5.20687E+01	8.7336E-01	1.1026E+01	9.6303E-01	0.000E+00	4.721E-02
2.807676E+01	5.18330E+01	7.6881E-01	9.0797E+00	8.8470E-01	0.000E+00	4.416E-02
3.001405E+01	5.14549E+01	6.7523E-01	7.4598E+00	8.1252E-01	0.000E+00	4.131E-02
3.208502E+01	5.05798E+01	5.9354E-01	6.1340E+00	7.4516E-01	0.000E+00	3.864E-02
3.250601E+01	5.01580E+01	5.7883E-01	5.9045E+00	7.3384E-01	0.000E+00	3.814E-02
3.300355E+01	4.89195E+01	5.6217E-01	5.6482E+00	7.1975E-01	0.000E+00	3.757E-02
3.313623E+01	4.74332E+01	5.5785E-01	5.5824E+00	7.1607E-01	0.000E+00	3.742E-02
3.333525E+01	4.89383E+01	3.4787E+00	3.4603E+01	7.1062E-01	2.912E+01	3.719E-02
3.383279E+01	5.02993E+01	3.3951E+00	3.3275E+01	6.9732E-01	2.802E+01	3.665E-02
3.429889E+01	5.08358E+01	3.3198E+00	3.2095E+01	6.8526E-01	2.705E+01	3.615E-02
3.666551E+01	5.19788E+01	2.9745E+00	2.6900E+01	6.2949E-01	2.274E+01	3.381E-02
3.919543E+01	5.24920E+01	2.6643E+00	2.2540E+01	5.7850E-01	1.911E+01	3.163E-02
4.189992E+01	5.28009E+01	2.3861E+00	1.8883E+01	5.3198E-01	1.606E+01	2.959E-02
4.479101E+01	5.30062E+01	2.1326E+00	1.5787E+01	4.8959E-01	1.345E+01	2.768E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
4.788159E+01	5.31422E+01	1.9025E+00	1.3175E+01	4.5103E-01	1.125E+01	2.589E-02
5.118542E+01	5.32332E+01	1.6966E+00	1.0991E+01	4.1601E-01	9.396E+00	2.422E-02
5.471721E+01	5.32932E+01	1.5126E+00	9.1664E+00	3.8423E-01	7.847E+00	2.266E-02
5.849270E+01	5.33312E+01	1.3483E+00	7.6433E+00	3.5543E-01	6.550E+00	2.120E-02
6.252870E+01	5.33535E+01	1.2017E+00	6.3726E+00	3.2936E-01	5.467E+00	1.983E-02
6.684318E+01	5.33967E+01	1.0706E+00	5.3109E+00	3.0578E-01	4.560E+00	1.855E-02
7.145536E+01	5.33976E+01	9.5063E-01	4.4114E+00	2.8446E-01	3.788E+00	1.735E-02
7.638578E+01	5.33913E+01	8.4419E-01	3.6646E+00	2.6518E-01	3.147E+00	1.623E-02
8.165640E+01	5.33819E+01	7.4857E-01	3.0398E+00	2.4777E-01	2.611E+00	1.518E-02
8.729069E+01	5.33679E+01	6.6149E-01	2.5128E+00	2.3203E-01	2.160E+00	1.420E-02
9.331374E+01	5.33500E+01	5.8460E-01	2.0774E+00	2.1781E-01	1.786E+00	1.329E-02
9.975239E+01	5.33303E+01	5.1669E-01	1.7175E+00	2.0494E-01	1.478E+00	1.243E-02
1.066353E+02	5.33097E+01	4.5670E-01	1.4202E+00	1.9329E-01	1.222E+00	1.163E-02
1.139931E+02	5.32891E+01	4.0372E-01	1.1744E+00	1.8273E-01	1.011E+00	1.088E-02
1.218587E+02	5.32686E+01	3.5690E-01	9.7118E-01	1.7314E-01	8.363E-01	1.017E-02
1.302669E+02	5.32488E+01	3.1554E-01	8.0321E-01	1.6442E-01	6.917E-01	9.518E-03
1.392553E+02	5.32296E+01	2.7900E-01	6.6434E-01	1.5647E-01	5.722E-01	8.903E-03
1.488640E+02	5.32114E+01	2.4674E-01	5.4961E-01	1.4920E-01	4.734E-01	8.329E-03
1.591356E+02	5.31942E+01	2.1827E-01	4.5480E-01	1.4254E-01	3.917E-01	7.791E-03
1.701159E+02	5.31781E+01	1.9309E-01	3.7637E-01	1.3641E-01	3.241E-01	7.288E-03
1.818539E+02	5.31630E+01	1.7083E-01	3.1148E-01	1.3076E-01	2.682E-01	6.818E-03
1.944018E+02	5.31489E+01	1.5114E-01	2.5780E-01	1.2553E-01	2.219E-01	6.378E-03
2.078156E+02	5.31359E+01	1.3373E-01	2.1338E-01	1.2066E-01	1.836E-01	5.966E-03
2.221548E+02	5.31238E+01	1.1833E-01	1.7663E-01	1.1612E-01	1.519E-01	5.581E-03
2.374835E+02	5.31126E+01	1.0472E-01	1.4621E-01	1.1187E-01	1.257E-01	5.221E-03
2.538699E+02	5.31024E+01	9.2670E-02	1.2104E-01	1.0787E-01	1.040E-01	4.884E-03
2.713869E+02	5.30929E+01	8.2014E-02	1.0021E-01	1.0409E-01	8.609E-02	4.569E-03
2.901126E+02	5.30843E+01	7.2587E-02	8.2965E-02	1.0051E-01	7.124E-02	4.274E-03
3.101304E+02	5.30764E+01	6.4247E-02	6.8693E-02	9.7108E-02	5.894E-02	3.998E-03
3.315294E+02	5.30692E+01	5.6869E-02	5.6879E-02	9.3857E-02	4.877E-02	3.740E-03
3.544049E+02	5.30626E+01	5.0340E-02	4.7099E-02	9.0745E-02	4.036E-02	3.498E-03
3.788588E+02	5.30566E+01	4.4562E-02	3.9003E-02	8.7755E-02	3.340E-02	3.273E-03
4.050001E+02	5.30511E+01	3.9450E-02	3.2299E-02	8.4877E-02	2.763E-02	3.061E-03
4.329451E+02	5.30461E+01	3.4926E-02	2.6750E-02	8.2099E-02	2.287E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 389

Xe Z = 54

Atomic weight = 1.312900E+02 g/mol, nominal density ρ (g/cm³) = 5.4580E-03

μ_0 (barns/atom) = μ (cm²/g) \times 2.18012E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 3.20514E+05

Edges. Edge energies (keV):

K		3.45614E+00	L	I	5.45280E+00	L	II	5.10370E+00	L	III	4.78220E+00
M	I	1.14460E+00	M	II	9.99000E-00	M	III	9.37000E-00	M	IV	6.85400E-01
N	V	6.72300E-00	N	I	2.08100E-00	N	II	1.46700E-00	N	III	1.46700E-01
O	IV	6.40000E-02	O	V	6.40000E-02						

Relativistic correction estimate f_{rel} (H82.3/5CL) = -6.4519E-01, -3.9600E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.2184E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.74817E+01	0.0000E+00	0.0000E+00	1.2269E-04	0.000E+00	1.160E+02
1.142761E-02	1.74729E+01	0.0000E+00	0.0000E+00	1.6884E-04	0.000E+00	1.085E+02
1.221612E-02	1.74627E+01	0.0000E+00	0.0000E+00	2.3108E-04	0.000E+00	1.015E+02
1.305903E-02	1.74510E+01	0.0000E+00	0.0000E+00	3.1456E-04	0.000E+00	9.494E+01
1.396010E-02	1.74376E+01	0.0000E+00	0.0000E+00	4.2589E-04	0.000E+00	8.881E+01
1.492335E-02	1.74222E+01	0.0000E+00	0.0000E+00	5.7356E-04	0.000E+00	8.308E+01
1.595306E-02	1.74044E+01	0.0000E+00	0.0000E+00	7.6833E-04	0.000E+00	7.772E+01
1.705382E-02	1.73839E+01	0.0000E+00	0.0000E+00	1.0238E-03	0.000E+00	7.270E+01
1.823053E-02	1.73603E+01	0.0000E+00	0.0000E+00	1.3571E-03	0.000E+00	6.801E+01
1.948844E-02	1.73330E+01	0.0000E+00	0.0000E+00	1.7896E-03	0.000E+00	6.362E+01
2.083314E-02	1.73014E+01	0.0000E+00	0.0000E+00	2.3476E-03	0.000E+00	5.951E+01
2.227063E-02	1.72647E+01	0.0000E+00	0.0000E+00	3.0638E-03	0.000E+00	5.567E+01
2.380730E-02	1.72221E+01	0.0000E+00	0.0000E+00	3.9781E-03	0.000E+00	5.208E+01
2.545001E-02	1.71724E+01	0.0000E+00	0.0000E+00	5.1389E-03	0.000E+00	4.872E+01
2.720606E-02	1.71143E+01	0.0000E+00	0.0000E+00	6.6051E-03	0.000E+00	4.557E+01
2.908327E-02	1.70460E+01	0.0000E+00	0.0000E+00	8.4470E-03	0.000E+00	4.263E+01
3.109002E-02	1.69653E+01	0.0000E+00	0.0000E+00	1.0749E-02	0.000E+00	3.988E+01
3.323523E-02	1.68696E+01	0.0000E+00	0.0000E+00	1.3610E-02	0.000E+00	3.731E+01
3.552846E-02	1.67551E+01	0.0000E+00	0.0000E+00	1.7149E-02	0.000E+00	3.490E+01
3.797993E-02	1.66169E+01	0.0000E+00	0.0000E+00	2.1502E-02	0.000E+00	3.264E+01
4.060054E-02	1.64483E+01	0.0000E+00	0.0000E+00	2.6829E-02	0.000E+00	3.054E+01
4.340198E-02	1.62392E+01	0.0000E+00	0.0000E+00	3.3314E-02	0.000E+00	2.857E+01
4.639671E-02	1.59749E+01	0.0000E+00	0.0000E+00	4.1170E-02	0.000E+00	2.672E+01
4.959809E-02	1.56310E+01	0.0000E+00	0.0000E+00	5.0637E-02	0.000E+00	2.500E+01
5.302035E-02	1.51635E+01	0.0000E+00	0.0000E+00	6.1986E-02	0.000E+00	2.338E+01
5.667876E-02	1.44787E+01	0.0000E+00	0.0000E+00	7.5523E-02	0.000E+00	2.187E+01
6.058959E-02	1.32889E+01	0.0000E+00	0.0000E+00	9.1589E-02	0.000E+00	2.046E+01
6.272000E-02	1.19994E+01	0.0000E+00	0.0000E+00	1.0103E-01	0.000E+00	1.977E+01
6.368000E-02	1.05181E+01	0.0000E+00	0.0000E+00	1.0543E-01	0.000E+00	1.947E+01
6.393600E-02	9.04168E+00	0.0000E+00	0.0000E+00	1.0663E-01	0.000E+00	1.939E+01
6.432000E-02	1.01989E+01	2.7373E+00	1.3641E+04	1.0843E-01	0.000E+00	1.928E+01
6.477028E-02	1.07681E+01	2.8683E+00	1.4194E+04	1.1056E-01	0.000E+00	1.914E+01
6.528000E-02	1.0295E+01	3.0230E+00	1.4842E+04	1.1300E-01	0.000E+00	1.899E+01
6.923942E-02	1.13451E+01	4.4855E+00	2.0764E+04	1.3284E-01	0.000E+00	1.791E+01
7.401695E-02	1.19353E+01	6.6806E+00	2.8929E+04	1.5890E-01	0.000E+00	1.675E+01
7.912411E-02	1.34352E+01	8.5363E+00	3.4579E+04	1.8920E-01	0.000E+00	1.567E+01
8.458368E-02	1.54567E+01	9.6404E+00	3.6531E+04	2.2426E-01	0.000E+00	1.466E+01
9.041995E-02	1.75482E+01	9.9217E+00	3.5170E+04	2.6464E-01	0.000E+00	1.371E+01
9.665893E-02	1.93672E+01	9.5457E+00	3.1653E+04	3.1091E-01	0.000E+00	1.283E+01
1.033284E-01	2.07487E+01	8.7673E+00	2.7195E+04	3.6367E-01	0.000E+00	1.200E+01
1.104581E-01	2.16728E+01	7.8187E+00	2.2687E+04	4.2352E-01	0.000E+00	1.122E+01
1.180797E-01	2.21972E+01	6.8627E+00	1.8628E+04	4.9108E-01	0.000E+00	1.050E+01
1.262272E-01	2.23982E+01	5.9915E+00	1.5214E+04	5.6698E-01	0.000E+00	9.822E+00
1.349368E-01	2.23204E+01	5.2451E+00	1.2459E+04	6.5182E-01	0.000E+00	9.188E+00
1.437660E-01	2.18272E+01	4.6587E+00	1.0386E+04	7.4122E-01	0.000E+00	8.624E+00
1.442475E-01	2.17629E+01	4.6310E+00	1.0290E+04	7.4618E-01	0.000E+00	8.595E+00
1.459665E-01	2.13416E+01	4.5353E+00	9.9587E+03	7.6397E-01	0.000E+00	8.494E+00
1.465533E-01	2.07968E+01	4.5038E+00	9.8498E+03	7.7007E-01	0.000E+00	8.460E+00
1.474335E-01	2.13224E+01	5.5082E+00	1.1975E+04	7.7924E-01	0.000E+00	8.410E+00
1.496340E-01	2.17567E+01	5.4034E+00	1.1574E+04	8.0228E-01	0.000E+00	8.285E+00
1.542005E-01	2.20064E+01	5.2082E+00	1.0826E+04	8.5061E-01	0.000E+00	8.040E+00

TABLE 1: Form factors, attenuation and scattering cross-sections. $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.648404E-01	2.21290E+01	4.8526E+00	9.4353E+03	9.6562E-01	0.000E+00	7.521E+00
1.762144E-01	2.20852E+01	4.5958E+00	8.3592E+03	1.0916E+00	0.000E+00	7.036E+00
1.883732E-01	2.19645E+01	4.4226E+00	7.5250E+03	1.2291E+00	0.000E+00	6.582E+00
2.013709E-01	2.17702E+01	4.3179E+00	6.8726E+03	1.3781E+00	0.000E+00	6.157E+00
2.039380E-01	2.16898E+01	4.3047E+00	6.7653E+03	1.4078E+00	0.000E+00	6.080E+00
2.070595E-01	2.14862E+01	4.2913E+00	6.6427E+03	1.4439E+00	0.000E+00	5.988E+00
2.078919E-01	2.12694E+01	4.2883E+00	6.6113E+03	1.4535E+00	0.000E+00	5.964E+00
2.091405E-01	2.14691E+01	4.6957E+00	7.1964E+03	1.4680E+00	0.000E+00	5.928E+00
2.122620E-01	2.16278E+01	4.6923E+00	7.0853E+03	1.5042E+00	0.000E+00	5.841E+00
2.152655E-01	2.16791E+01	4.6913E+00	6.9849E+03	1.5391E+00	0.000E+00	5.760E+00
2.301188E-01	2.17426E+01	4.7129E+00	6.5642E+03	1.7119E+00	0.000E+00	5.388E+00
2.459970E-01	2.17454E+01	4.7685E+00	6.2130E+03	1.8966E+00	0.000E+00	5.040E+00
2.629708E-01	2.17359E+01	4.8475E+00	5.9082E+03	2.0929E+00	0.000E+00	4.715E+00
2.811158E-01	2.17211E+01	4.9411E+00	5.6336E+03	2.3006E+00	0.000E+00	4.410E+00
3.005128E-01	2.16987E+01	5.0418E+00	5.3774E+03	2.5190E+00	0.000E+00	4.126E+00
3.212482E-01	2.16617E+01	5.1427E+00	5.1309E+03	2.7476E+00	0.000E+00	3.859E+00
3.434143E-01	2.15992E+01	5.2375E+00	4.8882E+03	2.9855E+00	0.000E+00	3.610E+00
3.671099E-01	2.14951E+01	5.3204E+00	4.6451E+03	3.2318E+00	0.000E+00	3.377E+00
3.924405E-01	2.13273E+01	5.3862E+00	4.3991E+03	3.4853E+00	0.000E+00	3.159E+00
4.195189E-01	2.10644E+01	5.4308E+00	4.1492E+03	3.7447E+00	0.000E+00	2.955E+00
4.484657E-01	2.06582E+01	5.4507E+00	3.8955E+03	4.0087E+00	0.000E+00	2.765E+00
4.794098E-01	2.00448E+01	5.4436E+00	3.6393E+03	4.2756E+00	0.000E+00	2.586E+00
5.124891E-01	1.91067E+01	5.4084E+00	3.3825E+03	4.5438E+00	0.000E+00	2.419E+00
5.478508E-01	1.76322E+01	5.3453E+00	3.1272E+03	4.8115E+00	0.000E+00	2.263E+00
5.856525E-01	1.51523E+01	5.2553E+00	2.8761E+03	5.0770E+00	0.000E+00	2.117E+00
6.260625E-01	1.02292E+01	5.1399E+00	2.6314E+03	5.3383E+00	0.000E+00	1.980E+00
6.588540E-01	-2.98003E-01	5.0359E+00	2.4498E+03	5.5341E+00	0.000E+00	1.882E+00
6.692609E-01	-1.24339E+01	5.0016E+00	2.3953E+03	5.5934E+00	0.000E+00	1.853E+00
6.716920E-01	-2.45681E+01	4.9935E+00	2.3828E+03	5.6071E+00	0.000E+00	1.846E+00
6.756615E-01	-1.32073E+01	2.7559E+01	1.3073E+04	5.6292E+00	0.000E+00	1.835E+00
6.819730E-01	-9.82041E+00	2.7119E+01	1.2746E+04	5.6640E+00	0.000E+00	1.818E+00
6.847146E-01	-1.53958E+01	2.6932E+01	1.2607E+04	5.6790E+00	0.000E+00	1.811E+00
6.857460E-01	-1.79455E+01	4.1885E+01	1.9577E+04	5.6846E+00	0.000E+00	1.808E+00
6.888270E-01	-5.13804E+00	4.1543E+01	1.9330E+04	5.7013E+00	0.000E+00	1.800E+00
6.991080E-01	5.78404E+00	4.0435E+01	1.8538E+04	5.7561E+00	0.000E+00	1.773E+00
7.154399E-01	1.37642E+01	3.8768E+01	1.7368E+04	5.8406E+00	0.000E+00	1.733E+00
7.648052E-01	2.45976E+01	3.4400E+01	1.4416E+04	6.0778E+00	0.000E+00	1.621E+00
8.175768E-01	2.97070E+01	3.0971E+01	1.2141E+04	6.3033E+00	0.000E+00	1.516E+00
8.739896E-01	3.25139E+01	2.8170E+01	1.0331E+04	6.5152E+00	0.000E+00	1.419E+00
9.182600E-01	3.29938E+01	2.6334E+01	9.1919E+03	6.6625E+00	0.000E+00	1.350E+00
9.323150E-01	3.18535E+01	2.5798E+01	8.8691E+03	6.7060E+00	0.000E+00	1.330E+00
9.342948E-01	3.12765E+01	2.5725E+01	8.8249E+03	6.7120E+00	0.000E+00	1.327E+00
9.360630E-01	3.00986E+01	2.5659E+01	8.7858E+03	6.7173E+00	0.000E+00	1.325E+00
9.416850E-01	3.21316E+01	2.9100E+01	9.9047E+03	6.7341E+00	0.000E+00	1.317E+00
9.557400E-01	3.40977E+01	2.8595E+01	9.5896E+03	6.7751E+00	0.000E+00	1.297E+00
9.790200E-01	3.53823E+01	2.7794E+01	9.0993E+03	6.8399E+00	0.000E+00	1.266E+00
9.940050E-01	3.54177E+01	2.7300E+01	8.8027E+03	6.8796E+00	0.000E+00	1.247E+00
9.987612E-01	3.39244E+01	2.7146E+01	8.7115E+03	6.8919E+00	0.000E+00	1.241E+00
1.003995E+00	3.59190E+01	2.8757E+01	9.1803E+03	6.9053E+00	0.000E+00	1.235E+00
1.018980E+00	3.73675E+01	2.8243E+01	8.8835E+03	6.9425E+00	0.000E+00	1.217E+00
1.067676E+00	3.97178E+01	2.6672E+01	8.0069E+03	7.0537E+00	0.000E+00	1.161E+00
1.121708E+00	4.11467E+01	2.5123E+01	7.1786E+03	7.1610E+00	0.000E+00	1.105E+00
1.138877E+00	4.11545E+01	2.4669E+01	6.9427E+03	7.1918E+00	0.000E+00	1.089E+00
1.141345E+00	4.10201E+01	2.4600E+01	6.9083E+03	7.1961E+00	0.000E+00	1.086E+00
1.143455E+00	4.07001E+01	2.4542E+01	6.8792E+03	7.1997E+00	0.000E+00	1.084E+00
1.150523E+00	4.14707E+01	2.5494E+01	7.1033E+03	7.2114E+00	0.000E+00	1.078E+00
1.167492E+00	4.24232E+01	2.5011E+01	6.8663E+03	7.2398E+00	0.000E+00	1.062E+00
1.220098E+00	4.39835E+01	2.3587E+01	6.1961E+03	7.3179E+00	0.000E+00	1.016E+00
1.304285E+00	4.55566E+01	2.1576E+01	5.3021E+03	7.4183E+00	0.000E+00	9.506E-01
1.394281E+00	4.66886E+01	1.9756E+01	4.5414E+03	7.4967E+00	0.000E+00	8.892E-01
1.490486E+00	4.75513E-01	1.8107E+01	3.8936E+03	7.5525E+00	0.000E+00	8.318E-01
1.593329E+00	4.82356E+01	1.6595E+01	3.3382E+03	7.5856E+00	0.000E+00	7.781E-01
1.703269E+00	4.87650E+01	1.5167E+01	2.8540E+03	7.5957E+00	0.000E+00	7.279E-01
1.820795E+00	4.91379E+01	1.3829E+01	2.4344E+03	7.5832E+00	0.000E+00	6.809E-01
1.946430E+00	4.93845E+01	1.2613E+01	2.0770E+03	7.5484E+00	0.000E+00	6.370E-01

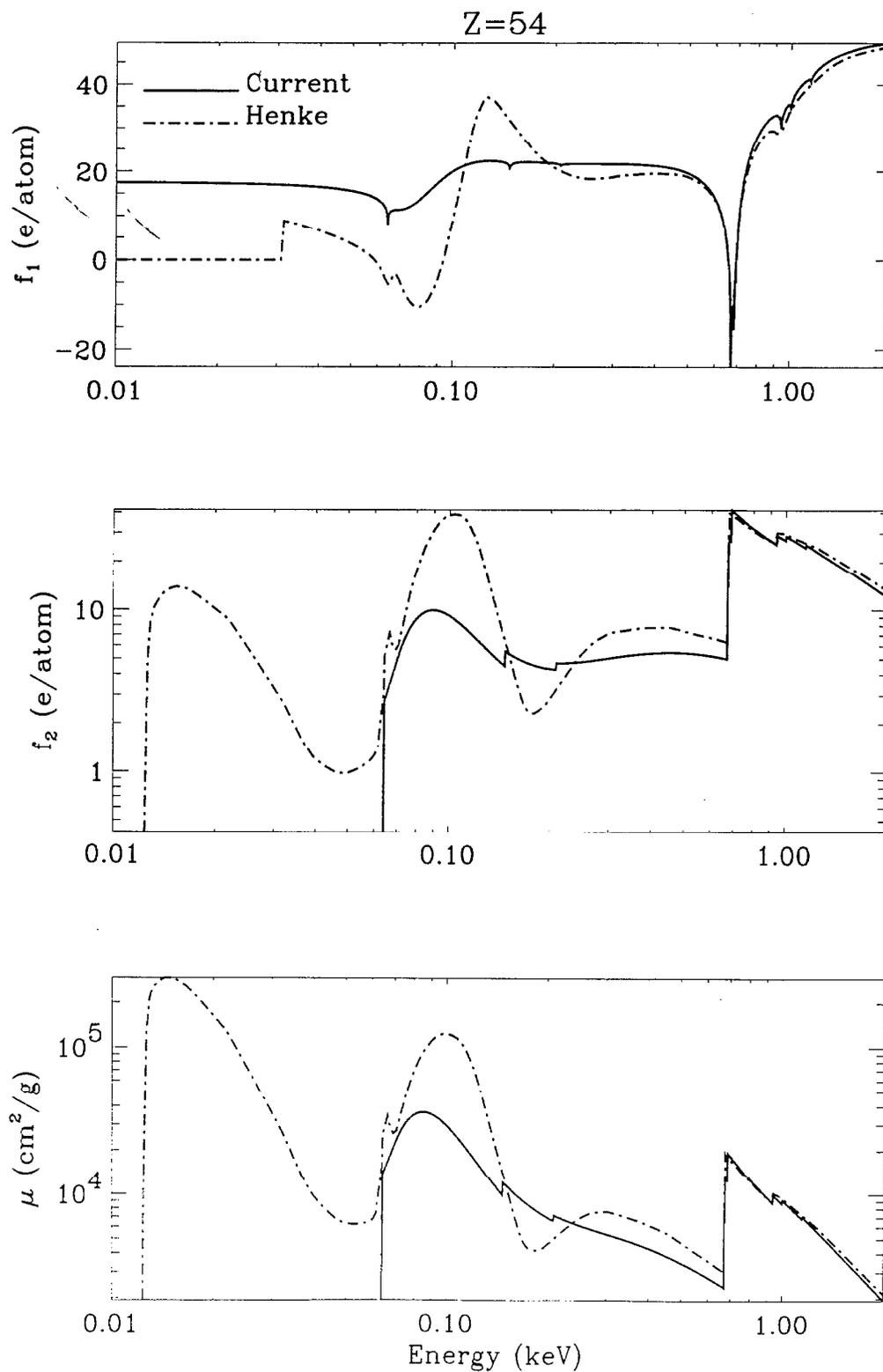
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 391

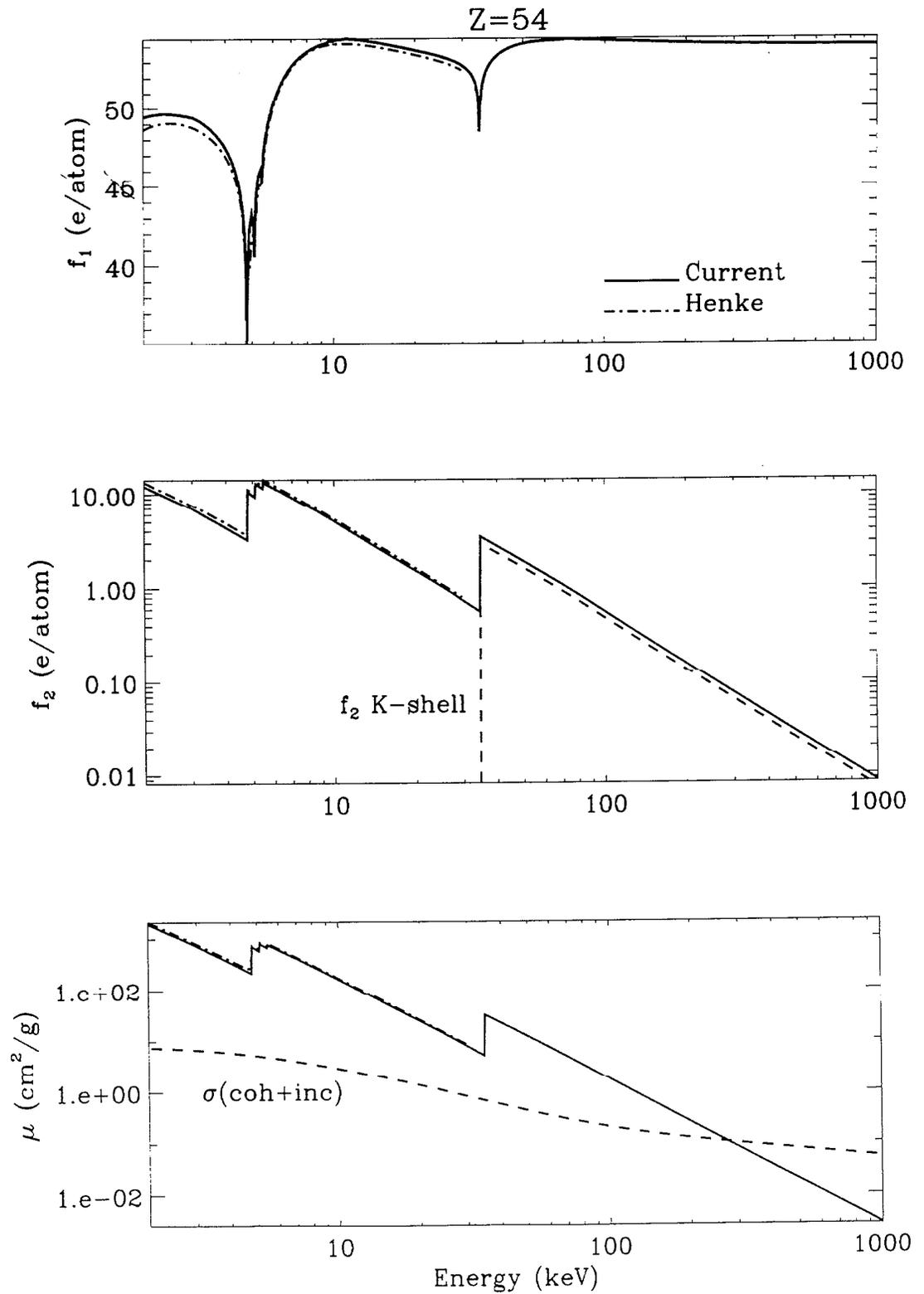
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
2.080733E+00	4.95404E+01	1.1509E+01	1.7729E+03	7.4919E+00	0.000E+00	5.959E-01
2.224304E+00	4.96205E+01	1.0509E+01	1.5143E+03	7.4143E+00	0.000E+00	5.574E-01
2.377781E+00	4.96670E+01	9.5998E+00	1.2940E+03	7.3167E+00	0.000E+00	5.214E-01
2.541848E+00	4.96398E+01	8.7741E+00	1.1064E+03	7.2000E+00	0.000E+00	4.878E-01
2.717235E+00	4.95830E+01	8.0226E+00	9.4631E+02	7.0656E+00	0.000E+00	4.563E-01
2.904724E+00	4.94927E+01	7.2962E+00	8.0508E+02	6.9146E+00	0.000E+00	4.268E-01
3.105150E+00	4.93460E+01	6.5778E+00	6.7897E+02	6.7485E+00	0.000E+00	3.993E-01
3.319406E+00	4.90369E+01	5.8878E+00	5.6852E+02	6.5689E+00	0.000E+00	3.735E-01
3.548445E+00	4.86191E+01	5.2812E+00	4.7703E+02	6.3772E+00	0.000E+00	3.494E-01
3.793288E+00	4.80668E+01	4.7420E+00	4.0068E+02	6.1750E+00	0.000E+00	3.269E-01
4.055024E+00	4.72888E+01	4.2430E+00	3.3537E+02	5.9640E+00	0.000E+00	3.058E-01
4.334821E+00	4.60511E+01	3.7928E+00	2.8044E+02	5.7456E+00	0.000E+00	2.860E-01
4.633924E+00	4.32904E+01	3.3957E+00	2.3487E+02	5.5216E+00	0.000E+00	2.676E-01
4.686556E+00	4.22221E+01	3.3332E+00	2.2796E+02	5.4832E+00	0.000E+00	2.646E-01
4.758289E+00	3.89074E+01	3.2512E+00	2.1900E+02	5.4314E+00	0.000E+00	2.606E-01
4.777418E+00	3.50859E+01	3.2299E+00	2.1669E+02	5.4176E+00	0.000E+00	2.595E-01
4.806111E+00	3.88484E+01	1.0612E+01	7.0771E+02	5.3971E+00	0.000E+00	2.580E-01
4.877844E+00	4.20237E+01	1.0271E+01	6.7488E+02	5.3463E+00	0.000E+00	2.542E-01
4.953664E+00	4.30390E+01	9.9278E+00	6.4236E+02	5.2933E+00	0.000E+00	2.503E-01
5.001626E+00	4.32058E+01	9.7191E+00	6.2282E+02	5.2600E+00	0.000E+00	2.479E-01
5.078182E+00	4.23055E+01	9.4930E+00	5.9537E+02	5.2075E+00	0.000E+00	2.442E-01
5.098596E+00	4.05721E+01	9.3624E+00	5.8855E+02	5.1937E+00	0.000E+00	2.432E-01
5.129219E+00	4.26732E+01	1.2947E+01	8.0903E+02	5.1729E+00	0.000E+00	2.417E-01
5.205774E+00	4.47523E+01	1.2575E+01	7.7423E+02	5.1216E+00	0.000E+00	2.382E-01
5.295467E+00	4.57697E+01	1.2166E+01	7.3639E+02	5.0622E+00	0.000E+00	2.341E-01
5.343744E+00	4.60586E+01	1.1958E+01	7.1721E+02	5.0307E+00	0.000E+00	2.320E-01
5.425536E+00	4.59458E+01	1.1638E+01	6.8749E+02	4.9778E+00	0.000E+00	2.285E-01
5.447347E+00	4.51763E+01	1.1557E+01	6.7997E+02	4.9638E+00	0.000E+00	2.276E-01
5.480064E+00	4.63112E+01	1.3252E+01	7.7507E+02	4.9430E+00	0.000E+00	2.262E-01
5.561856E+00	4.76166E+01	1.2949E+01	7.4624E+02	4.8914E+00	0.000E+00	2.229E-01
5.660855E+00	4.84989E+01	1.2605E+01	7.1369E+02	4.8299E+00	0.000E+00	2.190E-01
6.051453E+00	5.05102E+01	1.1420E+01	6.0487E+02	4.5975E+00	0.000E+00	2.049E-01
6.469004E+00	5.17598E+01	1.0336E+01	5.1209E+02	4.3664E+00	0.000E+00	1.917E-01
6.915365E+00	5.26129E+01	9.3148E+00	4.3173E+02	4.1376E+00	0.000E+00	1.793E-01
7.392525E+00	5.32022E+01	8.3751E+00	3.6312E+02	3.9123E+00	0.000E+00	1.677E-01
7.902609E+00	5.36109E+01	7.5253E+00	3.0521E+02	3.6914E+00	0.000E+00	1.569E-01
8.447890E+00	5.38997E+01	6.7644E+00	2.5664E+02	3.4758E+00	0.000E+00	1.468E-01
9.030794E+00	5.41224E+01	6.0747E+00	2.1560E+02	3.2661E+00	0.000E+00	1.373E-01
9.653919E+00	5.43248E+01	5.4221E+00	1.8002E+02	3.0630E+00	0.000E+00	1.284E-01
1.032004E+01	5.44259E+01	4.8271E+00	1.4992E+02	2.8670E+00	0.000E+00	1.201E-01
1.103212E+01	5.44732E+01	4.2915E+00	1.2468E+02	2.6787E+00	0.000E+00	1.124E-01
1.179334E+01	5.44466E+01	3.8087E+00	1.0351E+02	2.4982E+00	0.000E+00	1.051E-01
1.260708E+01	5.43916E+01	3.3831E+00	8.6011E+01	2.3259E+00	0.000E+00	9.834E-02
1.347697E+01	5.43183E+01	3.0070E+00	7.1513E+01	2.1619E+00	0.000E+00	9.200E-02
1.440688E+01	5.42329E+01	2.6749E+00	5.9510E+01	2.0063E+00	0.000E+00	8.606E-02
1.540095E+01	5.41397E+01	2.3817E+00	4.9566E+01	1.8592E+00	0.000E+00	8.050E-02
1.646362E+01	5.40413E+01	2.1226E+00	4.1322E+01	1.7204E+00	0.000E+00	7.531E-02
1.759961E+01	5.39394E+01	1.8933E+00	3.4480E+01	1.5900E+00	0.000E+00	7.045E-02
1.881398E+01	5.38345E+01	1.6890E+00	2.8774E+01	1.4676E+00	0.000E+00	6.590E-02
2.011215E+01	5.37261E+01	1.5075E+00	2.4024E+01	1.3532E+00	0.000E+00	6.165E-02
2.149988E+01	5.36131E+01	1.3446E+00	2.0045E+01	1.2464E+00	0.000E+00	5.767E-02
2.298338E+01	5.34914E+01	1.1978E+00	1.6705E+01	1.1471E+00	0.000E+00	5.395E-02
2.456923E+01	5.33563E+01	1.0650E+00	1.3893E+01	1.0549E+00	0.000E+00	5.046E-02
2.626450E+01	5.31993E+01	9.4548E-01	1.1538E+01	9.6958E-01	0.000E+00	4.721E-02
2.807676E+01	5.30051E+01	8.3239E-01	9.5022E+00	8.9072E-01	0.000E+00	4.416E-02
3.001405E+01	5.27236E+01	7.3122E-01	7.8085E+00	8.1803E-01	0.000E+00	4.131E-02
3.208502E+01	5.22415E+01	6.4288E-01	6.4221E+00	7.5116E-01	0.000E+00	3.864E-02
3.387017E+01	5.11766E+01	5.7946E-01	5.4835E+00	7.0094E-01	0.000E+00	3.661E-02
3.429889E+01	5.03220E+01	5.6569E-01	5.2863E+00	6.8977E-01	0.000E+00	3.615E-02
3.438859E+01	4.99447E+01	5.6288E-01	5.2462E+00	6.8748E-01	0.000E+00	3.605E-02
3.452684E+01	4.84666E+01	5.5858E-01	5.1853E+00	6.8397E-01	0.000E+00	3.591E-02
3.473421E+01	4.99634E+01	3.4633E+00	3.1958E+01	6.7876E-01	2.686E+01	3.570E-02
3.525263E+01	5.13169E+01	3.3800E+00	3.0730E+01	6.6605E-01	2.585E+01	3.517E-02
3.666551E+01	5.24379E+01	3.1686E+00	2.7698E+01	6.3353E-01	2.334E+01	3.381E-02
3.919543E+01	5.32174E+01	2.8388E+00	2.3214E+01	5.8210E-01	1.962E+01	3.163E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
4.189992E+01	5.36296E+01	2.5432E+00	1.9454E+01	5.3515E-01	1.649E+01	2.959E-02
4.479101E+01	5.38905E+01	2.2781E+00	1.6302E+01	4.9236E-01	1.386E+01	2.768E-02
4.788159E+01	5.40650E+01	2.0335E+00	1.3612E+01	4.5341E-01	1.159E+01	2.589E-02
5.118542E+01	5.41809E+01	1.8141E+00	1.1360E+01	4.1803E-01	9.687E+00	2.422E-02
5.471721E+01	5.42583E+01	1.6179E+00	9.4768E+00	3.8591E-01	8.092E+00	2.266E-02
5.849270E+01	5.43087E+01	1.4425E+00	7.9040E+00	3.5680E-01	6.757E+00	2.120E-02
6.252870E+01	5.43398E+01	1.2859E+00	6.5913E+00	3.3044E-01	5.641E+00	1.983E-02
6.684318E+01	5.43573E+01	1.1462E+00	5.4963E+00	3.0659E-01	4.708E+00	1.855E-02
7.145536E+01	5.43963E+01	1.0200E+00	4.5753E+00	2.8501E-01	3.921E+00	1.735E-02
7.638578E+01	5.43945E+01	9.0616E-01	3.8022E+00	2.6552E-01	3.258E+00	1.623E-02
8.165640E+01	5.43894E+01	8.0382E-01	3.1531E+00	2.4790E-01	2.704E+00	1.518E-02
8.729069E+01	5.43768E+01	7.1056E-01	2.6091E+00	2.3197E-01	2.238E+00	1.420E-02
9.331374E+01	5.43600E+01	6.2818E-01	2.1577E+00	2.1758E-01	1.852E+00	1.329E-02
9.975239E+01	5.43409E+01	5.5540E-01	1.7846E+00	2.0456E-01	1.533E+00	1.243E-02
1.066353E+02	5.43206E+01	4.9109E-01	1.4761E+00	1.9278E-01	1.268E+00	1.163E-02
1.139931E+02	5.43000E+01	4.3427E-01	1.2210E+00	1.8210E-01	1.050E+00	1.088E-02
1.218587E+02	5.42794E+01	3.8405E-01	1.0101E+00	1.7241E-01	8.685E-01	1.017E-02
1.302669E+02	5.42592E+01	3.3966E-01	8.3571E-01	1.6359E-01	7.187E-01	9.518E-03
1.392553E+02	5.42397E+01	3.0042E-01	6.9146E-01	1.5556E-01	5.947E-01	8.903E-03
1.488640E+02	5.42210E+01	2.6574E-01	5.7216E-01	1.4823E-01	4.922E-01	8.329E-03
1.591356E+02	5.42032E+01	2.3520E-01	4.7372E-01	1.4151E-01	4.075E-01	7.791E-03
1.701159E+02	5.41866E+01	2.0820E-01	3.9226E-01	1.3534E-01	3.375E-01	7.288E-03
1.818539E+02	5.41709E+01	1.8430E-01	3.2483E-01	1.2965E-01	2.794E-01	6.818E-03
1.944018E+02	5.41564E+01	1.6316E-01	2.6901E-01	1.2439E-01	2.314E-01	6.378E-03
2.078156E+02	5.41428E+01	1.4446E-01	2.2280E-01	1.1951E-01	1.916E-01	5.966E-03
2.221548E+02	5.41302E+01	1.2790E-01	1.8453E-01	1.1495E-01	1.587E-01	5.581E-03
2.374835E+02	5.41186E+01	1.1325E-01	1.5285E-01	1.1069E-01	1.314E-01	5.221E-03
2.538699E+02	5.41079E+01	1.0029E-01	1.2661E-01	1.0669E-01	1.088E-01	4.884E-03
2.713869E+02	5.40981E+01	8.8808E-02	1.0488E-01	1.0291E-01	9.010E-02	4.569E-03
2.901126E+02	5.40890E+01	7.8648E-02	8.6890E-02	9.9340E-02	7.461E-02	4.274E-03
3.101304E+02	5.40807E+01	6.9654E-02	7.1986E-02	9.5944E-02	6.179E-02	3.998E-03
3.315294E+02	5.40732E+01	6.1692E-02	5.9642E-02	9.2705E-02	5.116E-02	3.740E-03
3.544049E+02	5.40662E+01	5.4642E-02	4.9417E-02	8.9608E-02	4.237E-02	3.498E-03
3.788588E+02	5.40599E+01	4.8400E-02	4.0947E-02	8.6636E-02	3.508E-02	3.273E-03
4.050001E+02	5.40542E+01	4.2873E-02	3.3930E-02	8.3776E-02	2.905E-02	3.061E-03
4.329451E+02	5.40489E+01	3.7979E-02	2.8117E-02	8.1018E-02	2.406E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 395

Cs Z = 55

atomic weight = 1.329054E+02 g/mol, nominal density ρ (g/cm³) = 1.8700E+00

$\mu_{\text{barns/atom}} = \mu(\text{cm}^2/\text{g}) \times 2.20695\text{E}+02$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 3.16619\text{E}+05$

cdgcs. Edge energies (keV):

K		3.59846E+00	L	I	5.71430E+00	L	II	5.35940E+00	L	III	5.01190E+00
M	I	1.21710E+00	M	II	1.06500E+00	M	III	9.97600E-00	M	IV	7.39500E-01
N	V	7.25500E-00	N	I	2.30800E-00	N	II	1.72300E-00	N	III	1.61600E-01
O	IV	7.88000E-02	O	V	7.65000E-02	O	I	2.27000E-02	O	II	1.31000E-02
	III	1.14000E-02									

Relativistic correction estimate $f_{\text{rel}}(\text{H82,3/5CL}) = -6.7594\text{E}-01$, $-4.1400\text{E}-01$ e/atom

Nuclear Thomson correction $f_{\text{NT}} = -1.2486\text{E}-02$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	-1.21026E+01	0.0000E+00	0.0000E+00	1.2288E-04	0.000E+00	1.160E+02
1.117200E-02	-1.74936E+01	0.0000E+00	0.0000E+00	1.5180E-04	0.000E+00	1.110E+02
1.134300E-02	-2.44803E+01	0.0000E+00	0.0000E+00	1.6317E-04	0.000E+00	1.093E+02
1.138860E-02	-3.28699E+01	0.0000E+00	0.0000E+00	1.6631E-04	0.000E+00	1.089E+02
1.142761E-02	-2.79838E+01	1.6606E+01	4.6009E+05	1.6902E-04	0.000E+00	1.085E+02
1.145700E-02	-2.40414E+01	1.6512E+01	4.5631E+05	1.7109E-04	0.000E+00	1.082E+02
1.162800E-02	-1.63832E+01	1.5981E+01	4.3516E+05	1.8350E-04	0.000E+00	1.066E+02
1.221612E-02	-9.79847E+00	1.4334E+01	3.7151E+05	2.3124E-04	0.000E+00	1.015E+02
1.283800E-02	-9.31038E+00	1.2830E+01	3.1643E+05	2.9097E-04	0.000E+00	9.658E+01
1.303450E-02	-1.23379E+01	1.2378E+01	3.0068E+05	3.1197E-04	0.000E+00	9.512E+01
1.305903E-02	-1.35900E+01	1.2323E+01	2.9876E+05	3.1467E-04	0.000E+00	9.494E+01
1.308690E-02	-1.68117E+01	1.2259E+01	2.9660E+05	3.1775E-04	0.000E+00	9.474E+01
1.316550E-02	-1.15245E+01	2.1314E+01	5.1259E+05	3.2657E-04	0.000E+00	9.417E+01
1.336200E-02	-6.49255E+00	2.0509E+01	4.8596E+05	3.4938E-04	0.000E+00	9.279E+01
1.396010E-02	-1.15375E+00	1.8246E+01	4.1382E+05	4.2590E-04	0.000E+00	8.881E+01
1.492335E-02	2.52001E+00	1.5149E+01	3.2141E+05	5.7338E-04	0.000E+00	8.308E+01
1.595306E-02	4.35711E+00	1.2455E+01	2.4720E+05	7.6785E-04	0.000E+00	7.772E+01
1.705382E-02	5.23957E+00	1.0168E+01	1.8877E+05	1.0229E-03	0.000E+00	7.270E+01
1.823053E-02	5.54833E+00	8.2640E+00	1.4352E+05	1.3555E-03	0.000E+00	6.801E+01
1.948844E-02	5.49875E+00	6.7034E+00	1.0891E+05	1.7870E-03	0.000E+00	6.362E+01
2.083314E-02	5.22332E+00	5.4384E+00	8.2651E+04	2.3437E-03	0.000E+00	5.951E+01
2.224600E-02	4.81062E+00	4.4360E+00	6.3135E+04	3.0447E-03	0.000E+00	5.573E+01
2.227063E-02	4.80269E+00	4.4209E+00	6.2851E+04	3.0580E-03	0.000E+00	5.567E+01
2.258650E-02	4.69752E+00	4.2335E+00	5.9345E+04	3.2325E-03	0.000E+00	5.489E+01
2.267730E-02	4.66282E+00	4.1817E+00	5.8384E+04	3.2839E-03	0.000E+00	5.467E+01
2.281350E-02	4.62350E+00	4.1161E+00	5.7125E+04	3.3620E-03	0.000E+00	5.435E+01
2.315400E-02	4.51550E+00	3.9350E+00	5.3809E+04	3.5627E-03	0.000E+00	5.355E+01
2.380730E-02	4.29825E+00	3.6186E+00	4.8124E+04	3.9698E-03	0.000E+00	5.208E+01
2.545001E-02	3.73335E+00	2.9719E+00	3.6972E+04	5.1273E-03	0.000E+00	4.872E+01
2.720606E-02	3.11987E+00	2.4576E+00	2.8601E+04	6.5891E-03	0.000E+00	4.557E+01
2.908327E-02	2.46113E+00	2.0490E+00	2.2306E+04	8.4253E-03	0.000E+00	4.263E+01
3.109002E-02	1.75118E+00	1.7242E+00	1.7559E+04	1.0720E-02	0.000E+00	3.988E+01
3.323523E-02	9.76396E-01	1.4659E+00	1.3965E+04	1.3572E-02	0.000E+00	3.731E+01
3.552846E-02	1.21130E-01	1.2603E+00	1.1231E+04	1.7099E-02	0.000E+00	3.490E+01
3.797993E-02	-8.56516E-01	1.0965E+00	9.1406E+03	2.1437E-02	0.000E+00	3.264E+01
4.060054E-02	-1.99122E+00	9.6587E-01	7.5322E+03	2.6747E-02	0.000E+00	3.054E+01
4.340198E-02	-3.34832E+00	8.6170E-01	6.2861E+03	3.3211E-02	0.000E+00	2.857E+01
4.639571E-02	-5.01452E+00	7.7862E-01	5.3134E+03	4.1041E-02	0.000E+00	2.672E+01
4.959809E-02	-7.12612E+00	7.1281E-01	4.5503E+03	5.0477E-02	0.000E+00	2.500E+01
5.302035E-02	-9.90451E+00	6.6082E-01	3.9462E+03	6.1790E-02	0.000E+00	2.338E+01
5.667876E-02	-1.37385E+01	6.1996E-01	3.4632E+03	7.5286E-02	0.000E+00	2.187E+01
6.058959E-02	-1.93856E+01	5.8791E-01	3.0722E+03	9.1303E-02	0.000E+00	2.046E+01
6.477028E-02	-2.85658E+01	5.6270E-01	2.7507E+03	1.1022E-01	0.000E+00	1.914E+01
5.923942E-02	-4.63389E+01	5.4280E-01	2.4821E+03	1.3244E-01	0.000E+00	1.791E+01
7.401695E-02	-9.99590E+01	5.2698E-01	2.2542E+03	1.5843E-01	0.000E+00	1.675E+01
7.497000E-02	-1.29058E+02	5.2433E-01	2.2144E+03	1.6388E-01	0.000E+00	1.654E+01
7.611750E-02	-2.21925E+02	5.2132E-01	2.1685E+03	1.7056E-01	0.000E+00	1.629E+01
7.642350E-02	-3.40742E+02	5.2055E-01	2.1566E+03	1.7236E-01	0.000E+00	1.622E+01
7.688250E-02	-1.96862E+02	2.3160E+02	9.5377E+05	1.7508E-01	0.000E+00	1.613E+01
7.722400E-02	-1.47117E+02	2.1473E+02	8.8041E+05	1.7712E-01	0.000E+00	1.606E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
7.803000E-02	-1.17448E+02	1.7989E+02	7.2993E+05	1.8197E-01	0.000E+00	1.589E+01
7.840600E-02	-1.39264E+02	1.6574E+02	6.6928E+05	1.8425E-01	0.000E+00	1.581E+01
7.872120E-02	-2.36373E+02	1.5478E+02	6.2254E+05	1.8618E-01	0.000E+00	1.575E+01
7.912411E-02	-9.56342E+01	3.6460E+02	1.4590E+06	1.8865E-01	0.000E+00	1.567E+01
7.919400E-02	-7.70908E+01	3.5890E+02	1.4349E+06	1.8908E-01	0.000E+00	1.566E+01
8.037600E-02	5.84873E+01	2.7558E+02	1.0856E+06	1.9644E-01	0.000E+00	1.543E+01
8.458368E-02	1.22570E+02	1.1118E+02	4.1617E+05	2.2364E-01	0.000E+00	1.466E+01
9.041995E-02	9.31188E+01	3.7396E+01	1.3095E+05	2.6394E-01	0.000E+00	1.371E+01
9.665893E-02	6.88276E+01	1.6039E+01	5.2538E+04	3.1012E-01	0.000E+00	1.283E+01
1.033284E-01	5.43537E+01	8.5172E+00	2.6098E+04	3.6279E-01	0.000E+00	1.200E+01
1.104581E-01	4.54066E+01	5.3851E+00	1.5436E+04	4.2256E-01	0.000E+00	1.122E+01
1.180797E-01	3.95075E+01	3.9085E+00	1.0480E+04	4.9005E-01	0.000E+00	1.050E+01
1.262272E-01	3.53773E+01	3.1538E+00	7.9108E+03	5.6588E-01	0.000E+00	9.822E+00
1.349368E-01	3.23276E+01	2.7563E+00	6.4674E+03	6.5067E-01	0.000E+00	9.188E+00
1.442475E-01	2.99529E+01	2.5570E+00	5.6125E+03	7.4500E-01	0.000E+00	8.595E+00
1.542005E-01	2.79430E+01	2.4801E+00	5.0924E+03	8.4945E-01	0.000E+00	8.040E+00
1.583680E-01	2.71051E+01	2.4742E+00	4.9465E+03	8.9413E-01	0.000E+00	7.829E+00
1.607920E-01	2.64045E+01	2.4760E+00	4.8756E+03	9.2035E-01	0.000E+00	7.711E+00
1.614384E-01	2.58952E+01	2.4771E+00	4.8582E+03	9.2737E-01	0.000E+00	7.680E+00
1.624080E-01	2.61848E+01	3.3029E+00	6.4391E+03	9.3793E-01	0.000E+00	7.634E+00
1.648404E-01	2.62309E+01	3.3175E+00	6.3722E+03	9.6451E-01	0.000E+00	7.521E+00
1.688540E-01	2.59271E+01	3.3477E+00	6.2772E+03	1.0087E+00	0.000E+00	7.343E+00
1.714385E-01	2.56084E+01	3.3705E+00	6.2248E+03	1.0373E+00	0.000E+00	7.232E+00
1.721277E-01	2.53979E+01	3.3770E+00	6.2119E+03	1.0450E+00	0.000E+00	7.203E+00
1.731615E-01	2.54860E+01	3.7029E+00	6.7706E+03	1.0565E+00	0.000E+00	7.160E+00
1.757460E-01	2.54439E+01	3.7310E+00	6.7217E+03	1.0854E+00	0.000E+00	7.055E+00
1.762144E-01	2.54243E+01	3.7364E+00	6.7134E+03	1.0906E+00	0.000E+00	7.036E+00
1.883732E-01	2.47988E+01	3.8938E+00	6.5447E+03	1.2282E+00	0.000E+00	6.582E+00
2.013709E-01	2.41919E+01	4.0923E+00	6.4344E+03	1.3775E+00	0.000E+00	6.157E+00
2.152655E-01	2.36419E+01	4.3240E+00	6.3599E+03	1.5388E+00	0.000E+00	5.760E+00
2.261840E-01	2.31850E+01	4.5120E+00	6.3161E+03	1.6661E+00	0.000E+00	5.482E+00
2.296460E-01	2.29041E+01	4.5717E+00	6.3031E+03	1.7065E+00	0.000E+00	5.399E+00
2.301188E-01	2.28143E+01	4.5798E+00	6.3013E+03	1.7120E+00	0.000E+00	5.388E+00
2.305692E-01	2.26410E+01	4.5876E+00	6.2997E+03	1.7173E+00	0.000E+00	5.377E+00
2.319540E-01	2.28565E+01	5.0882E+00	6.9454E+03	1.7335E+00	0.000E+00	5.345E+00
2.354160E-01	2.30017E+01	5.1508E+00	6.9274E+03	1.7739E+00	0.000E+00	5.267E+00
2.459970E-01	2.30229E+01	5.3390E+00	6.8717E+03	1.8973E+00	0.000E+00	5.040E+00
2.629108E-01	2.29649E+01	5.6267E+00	6.7746E+03	2.0943E+00	0.000E+00	4.715E+00
2.811158E-01	2.29380E+01	5.9045E+00	6.6502E+03	2.3027E+00	0.000E+00	4.410E+00
3.005128E-01	2.29549E+01	6.1620E+00	6.4922E+03	2.5222E+00	0.000E+00	4.126E+00
3.212482E-01	2.30087E+01	6.3883E+00	6.2963E+03	2.7519E+00	0.000E+00	3.859E+00
3.434143E-01	2.30822E+01	6.5697E+00	6.0571E+03	2.9912E+00	0.000E+00	3.610E+00
3.671099E-01	2.31512E+01	6.7002E+00	5.7787E+03	3.2390E+00	0.000E+00	3.377E+00
3.924405E-01	2.31889E+01	6.7780E+00	5.4684E+03	3.4942E+00	0.000E+00	3.159E+00
4.195189E-01	2.31648E+01	6.8036E+00	5.1348E+03	3.7556E+00	0.000E+00	2.955E+00
4.484657E-01	2.30427E+01	6.7792E+00	4.7862E+03	4.0218E+00	0.000E+00	2.765E+00
4.794098E-01	2.27759E+01	6.7095E+00	4.4312E+03	4.2911E+00	0.000E+00	2.586E+00
5.124891E-01	2.23011E+01	6.5999E+00	4.0774E+03	4.5620E+00	0.000E+00	2.419E+00
5.478508E-01	2.15152E+01	6.4564E+00	3.7313E+03	4.8327E+00	0.000E+00	2.263E+00
5.85525E-01	2.02337E+01	6.2849E+00	3.3978E+03	5.1012E+00	0.000E+00	2.117E+00
6.26625E-01	1.80693E+01	6.0915E+00	3.0806E+03	5.3659E+00	0.000E+00	1.980E+00
6.692609E-01	1.38951E+01	5.8812E+00	2.7823E+03	5.6246E+00	0.000E+00	1.853E+00
7.109900E-01	2.98332E+00	5.5798E+00	2.5293E+03	5.8524E+00	0.000E+00	1.744E+00
7.154399E-01	6.04433E-02	5.5585E+00	2.5042E+03	5.8755E+00	0.000E+00	1.733E+00
7.218725E-01	-7.72576E+00	5.6279E+00	2.4685E+03	5.9085E+00	0.000E+00	1.718E+00
7.247100E-01	-1.85884E+01	5.5145E+00	2.4529E+03	5.9229E+00	0.000E+00	1.711E+00
7.247745E-01	-1.91803E+01	5.5142E+00	2.4526E+03	5.9232E+00	0.000E+00	1.711E+00
7.291275E-01	-9.26291E+00	2.6798E+01	1.1637E+04	5.9451E+00	0.000E+00	1.700E+00
7.358025E-01	-6.15356E+00	2.6411E+01	1.1365E+04	5.9783E+00	0.000E+00	1.685E+00
7.387605E-01	-1.13635E+01	2.6242E+01	1.1247E+04	5.9928E+00	0.000E+00	1.678E+00
7.400100E-01	-1.22738E+01	4.0226E+01	1.7211E+04	5.9989E+00	0.000E+00	1.675E+00
7.431975E-01	-1.76746E+00	3.9937E+01	1.7014E+04	6.0144E+00	0.000E+00	1.668E+00
7.542900E-01	8.45083E+00	3.8958E+01	1.6353E+04	6.0675E+00	0.000E+00	1.644E+00
7.64892E-01	1.34408E+01	3.8065E+01	1.5758E+04	6.1167E+00	0.000E+00	1.621E+00
8.175768E-01	2.52035E+01	3.4073E+01	1.3195E+04	6.3463E+00	0.000E+00	1.516E+00

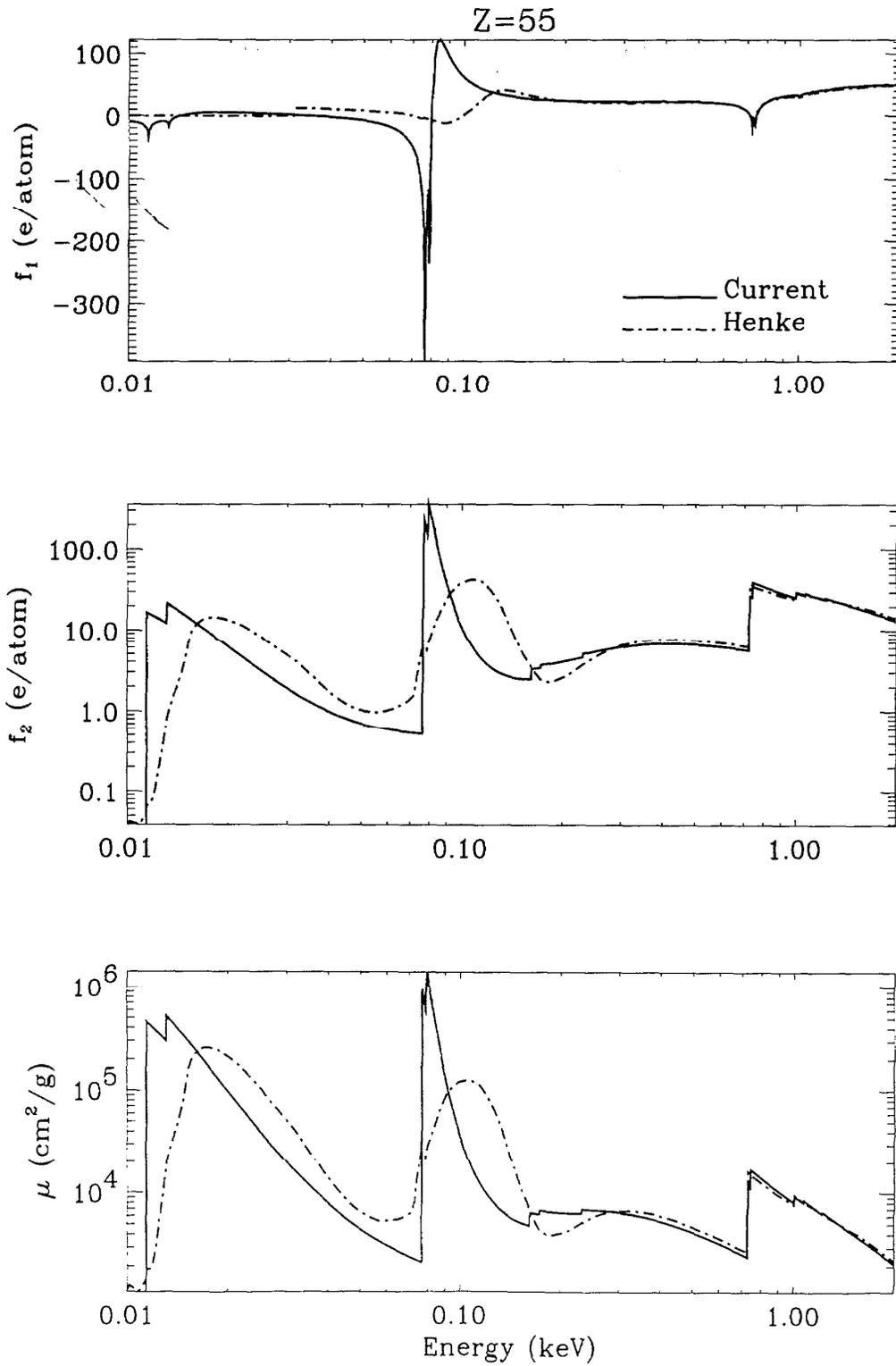
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 397

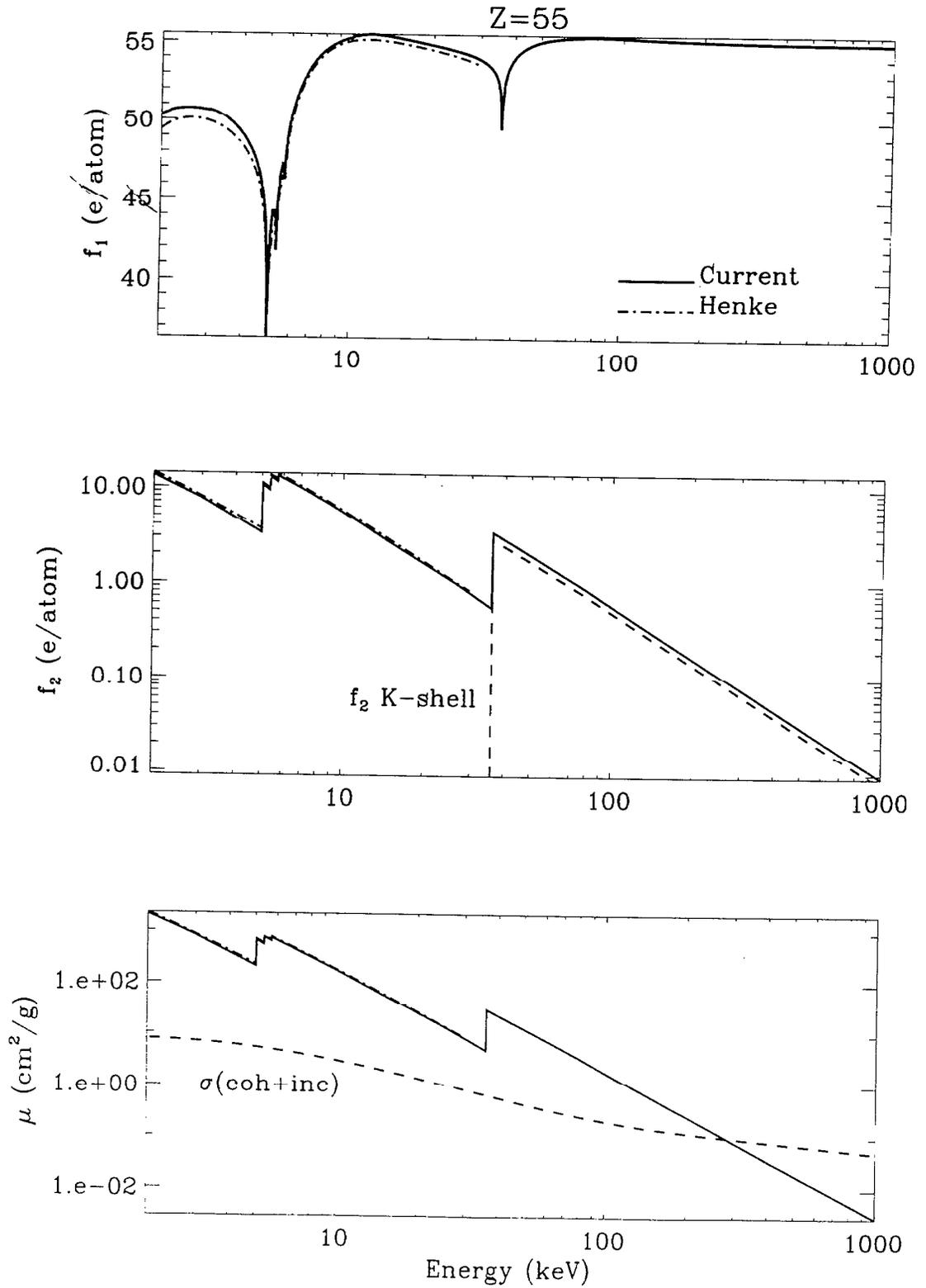
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
8.739896E-01	3.05574E+01	3.0811E+01	1.1162E+04	6.5624E+00	0.000E+00	1.419E+00
9.342948E-01	3.34544E+01	2.8078E+01	9.5151E+03	6.7635E+00	0.000E+00	1.327E+00
9.776480E-01	3.38710E+01	2.6398E+01	8.5492E+03	6.8907E+00	0.000E+00	1.268E+00
9.926120E-01	3.26294E+01	2.5859E+01	8.2484E+03	6.9315E+00	0.000E+00	1.249E+00
9.966024E-01	3.06735E+01	2.5718E+01	8.1706E+03	6.9422E+00	0.000E+00	1.244E+00
9.987612E-01	3.09608E+01	2.9754E+01	9.4323E+03	6.9479E+00	0.000E+00	1.241E+00
1.002588E+00	3.29983E+01	2.9597E+01	9.3469E+03	6.9579E+00	0.000E+00	1.237E+00
1.017552E+00	3.52241E+01	2.9002E+01	9.0242E+03	6.9962E+00	0.000E+00	1.218E+00
1.043700E+00	3.67290E+01	2.8014E+01	8.4984E+03	7.0596E+00	0.000E+00	1.188E+00
1.059675E+00	3.68058E+01	2.7441E+01	8.1990E+03	7.0963E+00	0.000E+00	1.170E+00
1.063935E+00	3.61034E+01	2.7292E+01	8.1218E+03	7.1058E+00	0.000E+00	1.165E+00
1.067676E+00	3.67852E+01	2.8939E+01	8.5817E+03	7.1141E+00	0.000E+00	1.161E+00
1.070325E+00	3.72994E+01	2.8836E+01	8.5303E+03	7.1199E+00	0.000E+00	1.158E+00
1.086300E+00	3.87407E+01	2.8234E+01	8.2292E+03	7.1541E+00	0.000E+00	1.141E+00
1.141345E+00	4.10242E+01	2.6429E+01	7.3316E+03	7.2609E+00	0.000E+00	1.086E+00
1.192758E+00	4.21692E+01	2.5038E+01	6.6463E+03	7.3466E+00	0.000E+00	1.039E+00
1.211015E+00	4.21411E+01	2.4588E+01	6.4284E+03	7.3740E+00	0.000E+00	1.024E+00
1.215883E+00	4.16738E+01	2.4471E+01	6.3723E+03	7.3811E+00	0.000E+00	1.020E+00
1.220098E+00	4.21059E+01	2.5527E+01	6.6243E+03	7.3871E+00	0.000E+00	1.016E+00
1.223186E+00	4.24448E+01	2.5452E+01	6.5882E+03	7.3915E+00	0.000E+00	1.014E+00
1.241442E+00	4.33922E+01	2.4988E+01	6.3729E+03	7.4165E+00	0.000E+00	9.987E-01
1.304285E+00	4.50837E+01	2.3435E+01	5.6890E+03	7.4919E+00	0.000E+00	9.506E-01
1.394281E+00	4.66262E+01	2.1528E+01	4.8887E+03	7.5745E+00	0.000E+00	8.892E-01
1.490486E+00	4.77757E+01	1.9742E+01	4.1937E+03	7.6345E+00	0.000E+00	8.318E-01
1.593329E+00	4.86563E+01	1.8090E+01	3.5948E+03	7.6714E+00	0.000E+00	7.781E-01
1.703269E+00	4.93538E+01	1.6560E+01	3.0783E+03	7.6853E+00	0.000E+00	7.279E-01
1.820795E+00	4.98622E+01	1.5099E+01	2.6256E+03	7.6763E+00	0.000E+00	6.809E-01
1.946430E+00	5.02114E+01	1.3769E+01	2.2398E+03	7.6447E+00	0.000E+00	6.370E-01
2.080733E+00	5.04447E+01	1.2563E+01	1.9117E+03	7.5911E+00	0.000E+00	5.959E-01
2.224304E+00	5.06470E+01	1.1459E+01	1.6312E+03	7.5161E+00	0.000E+00	5.574E-01
2.377781E+00	5.07185E+01	1.0455E+01	1.3922E+03	7.4207E+00	0.000E+00	5.214E-01
2.541848E+00	5.07506E+01	9.5448E+00	1.1889E+03	7.3059E+00	0.000E+00	4.878E-01
2.717235E+00	5.07139E+01	8.7209E+00	1.0162E+03	7.1729E+00	0.000E+00	4.563E-01
2.904724E+00	5.06493E+01	7.9771E+00	8.6952E+02	7.0231E+00	0.000E+00	4.268E-01
3.105150E+00	5.05732E+01	7.1995E+00	7.3410E+02	6.8577E+00	0.000E+00	3.993E-01
3.319406E+00	5.03418E+01	6.4441E+00	6.1467E+02	6.6784E+00	0.000E+00	3.735E-01
3.548445E+00	5.00012E+01	5.7780E+00	5.1556E+02	6.4867E+00	0.000E+00	3.494E-01
3.793288E+00	4.95485E+01	5.1910E+00	4.3329E+02	6.2841E+00	0.000E+00	3.269E-01
4.055024E+00	4.89460E+01	4.6666E+00	3.6437E+02	6.0723E+00	0.000E+00	3.058E-01
4.334821E+00	4.80760E+01	4.1851E+00	3.0568E+02	5.8528E+00	0.000E+00	2.860E-01
4.633924E+00	4.66164E+01	3.7579E+00	2.5677E+02	5.6272E+00	0.000E+00	2.676E-01
4.911662E+00	4.33790E+01	3.4164E+00	2.2023E+02	5.4267E+00	0.000E+00	2.524E-01
4.953664E+00	4.20880E+01	3.3694E+00	2.1536E+02	5.3971E+00	0.000E+00	2.503E-01
4.986840E+00	4.01016E+01	3.3331E+00	2.1162E+02	5.3739E+00	0.000E+00	2.486E-01
5.006888E+00	3.63183E+01	3.3114E+00	2.0940E+02	5.3600E+00	0.000E+00	2.476E-01
5.036959E+00	4.00489E+01	1.0623E+01	6.6775E+02	5.3391E+00	0.000E+00	2.461E-01
5.112138E+00	4.32059E+01	1.0283E+01	6.3688E+02	5.2874E+00	0.000E+00	2.425E-01
5.252212E+00	4.44330E+01	9.6920E+00	5.8426E+02	5.1928E+00	0.000E+00	2.361E-01
5.295467E+00	4.42277E+01	9.5385E+00	5.7031E+02	5.1640E+00	0.000E+00	2.341E-01
5.332603E+00	4.35105E+01	9.4138E+00	5.5893E+02	5.1395E+00	0.000E+00	2.325E-01
5.354040E+00	4.17843E+01	9.3437E+00	5.5255E+02	5.1254E+00	0.000E+00	2.316E-01
5.386197E+00	4.38628E+01	1.2901E+01	7.5838E+02	5.1044E+00	0.000E+00	2.302E-01
5.466588E+00	4.59086E+01	1.2529E+01	7.2565E+02	5.0523E+00	0.000E+00	2.268E-01
5.600014E+00	4.71111E+01	1.1957E+01	6.7602E+02	4.9674E+00	0.000E+00	2.214E-01
5.660855E+00	4.71838E+01	1.1722E+01	6.5565E+02	4.9293E+00	0.000E+00	2.190E-01
5.685729E+00	4.70101E+01	1.1632E+01	6.4775E+02	4.9139E+00	0.000E+00	2.181E-01
5.708586E+00	4.62463E+01	1.1551E+01	6.4063E+02	4.8997E+00	0.000E+00	2.172E-01
5.742872E+00	4.73775E+01	1.3236E+01	7.2976E+02	4.8786E+00	0.000E+00	2.159E-01
5.828586E+00	4.86805E+01	1.2933E+01	7.0256E+02	4.8264E+00	0.000E+00	2.127E-01
6.051453E+00	5.03007E+01	1.2217E+01	6.3923E+02	4.6943E+00	0.000E+00	2.049E-01
6.469004E+00	5.19890E+01	1.1075E+01	5.4204E+02	4.4604E+00	0.000E+00	1.917E-01
6.915365E+00	5.30921E+01	1.0007E+01	4.5818E+02	4.2287E+00	0.000E+00	1.793E-01
7.392525E+00	5.38505E+01	9.0110E+00	3.8594E+02	4.0002E+00	0.000E+00	1.677E-01
7.902609E+00	5.43753E+01	8.1009E+00	3.2456E+02	3.7760E+00	0.000E+00	1.569E-01
8.447890E+00	5.47429E+01	7.2827E+00	2.7295E+02	3.5569E+00	0.000E+00	1.468E-01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
9.030794E+00	5.50192E+01	6.5399E+00	2.2929E+02	3.3438E+00	0.000E+00	1.373E-01
9.653919E+00	5.51931E+01	5.8397E+00	1.9152E+02	3.1371E+00	0.000E+00	1.284E-01
1.032004E+01	5.53657E+01	5.2103E+00	1.5985E+02	2.9376E+00	0.000E+00	1.201E-01
1.103212E+01	5.54449E+01	4.6386E+00	1.3313E+02	2.7456E+00	0.000E+00	1.124E-01
1.179334E+01	5.54785E+01	4.1219E+00	1.1066E+02	2.5616E+00	0.000E+00	1.051E-01
1.260708E+01	5.54399E+01	3.6594E+00	9.1903E+01	2.3858E+00	0.000E+00	9.834E-02
1.347697E+01	5.53771E+01	3.2515E+00	7.6389E+01	2.2183E+00	0.000E+00	9.200E-02
1.440688E+01	5.52986E+01	2.8911E+00	6.3536E+01	2.0593E+00	0.000E+00	8.606E-02
1.540095E+01	5.52096E+01	2.5727E+00	5.2890E+01	1.9088E+00	0.000E+00	8.050E-02
1.646362E+01	5.51139E+01	2.2914E+00	4.4067E+01	1.7669E+00	0.000E+00	7.531E-02
1.759961E+01	5.50136E+01	2.0427E+00	3.6749E+01	1.6332E+00	0.000E+00	7.045E-02
1.881398E+01	5.49102E+01	1.8226E+00	3.0673E+01	1.5079E+00	0.000E+00	6.590E-02
2.011215E+01	5.48037E+01	1.6265E+00	2.5606E+01	1.3906E+00	0.000E+00	6.165E-02
2.149988E+01	5.46938E+01	1.4529E+00	2.1396E+01	1.2811E+00	0.000E+00	5.767E-02
2.298338E+01	5.45784E+01	1.2958E+00	1.7851E+01	1.1791E+00	0.000E+00	5.395E-02
2.456923E+01	5.44532E+01	1.1546E+00	1.4880E+01	1.0845E+00	0.000E+00	5.046E-02
2.626450E+01	5.43136E+01	1.0260E+00	1.2369E+01	9.9677E-01	0.000E+00	4.721E-02
2.807676E+01	5.41460E+01	9.0351E-01	1.0189E+01	9.1571E-01	0.000E+00	4.416E-02
3.001405E+01	5.39188E+01	7.9396E-01	8.3754E+00	8.4095E-01	0.000E+00	4.131E-02
3.208502E+01	5.35825E+01	6.9828E-01	6.8907E+00	7.7215E-01	0.000E+00	3.864E-02
3.429889E+01	5.29105E+01	6.1464E-01	5.6739E+00	7.0896E-01	0.000E+00	3.615E-02
3.526491E+01	5.21950E+01	5.8299E-01	5.2343E+00	6.8423E-01	0.000E+00	3.516E-02
3.580468E+01	5.09706E+01	5.6641E-01	5.0088E+00	6.7109E-01	0.000E+00	3.463E-02
3.594862E+01	4.95025E+01	5.6212E-01	4.9509E+00	6.6766E-01	0.000E+00	3.449E-02
3.616452E+01	5.09879E+01	3.4469E+00	3.0177E+01	6.6258E-01	2.531E+01	3.428E-02
3.666551E+01	5.22763E+01	3.3719E+00	2.9117E+01	6.5105E-01	2.444E+01	3.381E-02
3.670429E+01	5.23309E+01	3.3662E+00	2.9038E+01	6.5017E-01	2.438E+01	3.378E-02
3.919543E+01	5.38290E+01	3.0270E+00	2.4452E+01	5.9807E-01	2.060E+01	3.163E-02
4.189992E+01	5.44128E+01	2.7121E+00	2.0494E+01	5.4969E-01	1.731E+01	2.959E-02
4.479101E+01	5.47513E+01	2.4284E+00	1.7166E+01	5.0559E-01	1.454E+01	2.768E-02
4.788159E+01	5.49722E+01	2.1715E+00	1.4359E+01	4.6545E-01	1.219E+01	2.589E-02
5.118542E+01	5.51185E+01	1.9375E+00	1.1985E+01	4.2897E-01	1.019E+01	2.422E-02
5.471721E+01	5.52163E+01	1.7284E+00	1.0001E+01	3.9586E-01	8.512E+00	2.266E-02
5.849270E+01	5.52810E+01	1.5415E+00	8.3441E+00	3.6584E-01	7.110E+00	2.120E-02
6.252870E+01	5.53226E+01	1.3747E+00	6.9608E+00	3.3866E-01	5.937E+00	1.983E-02
6.684318E+01	5.53477E+01	1.2258E+00	5.8063E+00	3.1407E-01	4.957E+00	1.855E-02
7.145536E+01	5.53613E+01	1.0930E+00	4.8430E+00	2.9184E-01	4.138E+00	1.735E-02
7.638578E+01	5.53958E+01	9.1171E-01	4.0277E+00	2.7175E-01	3.441E+00	1.623E-02
8.165640E+01	5.53951E+01	8.6233E-01	3.3437E+00	2.5359E-01	2.858E+00	1.518E-02
8.729069E+01	5.53844E+01	7.6264E-01	2.7662E+00	2.3720E-01	2.366E+00	1.420E-02
9.331374E+01	5.53689E+01	6.7454E-01	2.2888E+00	2.2238E-01	1.959E+00	1.329E-02
9.975239E+01	5.53507E+01	5.9667E-01	1.8939E+00	2.0899E-01	1.622E+00	1.243E-02
1.066353E+02	5.53310E+01	5.2783E-01	1.5672E+00	1.9688E-01	1.342E+00	1.163E-02
1.139931E+02	5.53105E+01	4.6698E-01	1.2970E+00	1.8590E-01	1.111E+00	1.088E-02
1.218587E+02	5.52899E+01	4.1317E-01	1.0735E+00	1.7595E-01	9.202E-01	1.017E-02
1.302669E+02	5.52695E+01	3.6559E-01	8.8858E-01	1.6690E-01	7.618E-01	9.518E-03
1.392553E+02	5.52497E+01	3.2351E-01	7.3556E-01	1.5867E-01	6.307E-01	8.903E-03
1.488640E+02	5.52306E+01	2.8630E-01	6.0894E-01	1.5115E-01	5.222E-01	8.329E-03
1.591356E+02	5.52123E+01	2.5345E-01	5.0427E-01	1.4427E-01	4.324E-01	7.791E-03
1.701159E+02	5.51951E+01	2.2452E-01	4.1788E-01	1.3795E-01	3.583E-01	7.288E-03
1.818539E+02	5.51790E+01	1.9890E-01	3.4630E-01	1.3213E-01	2.970E-01	6.818E-03
1.944018E+02	5.51639E+01	1.7622E-01	2.8701E-01	1.2675E-01	2.461E-01	6.378E-03
2.078156E+02	5.51498E+01	1.5613E-01	2.3788E-01	1.2175E-01	2.039E-01	5.966E-03
2.221548E+02	5.51368E+01	1.3835E-01	1.9717E-01	1.1709E-01	1.690E-01	5.581E-03
2.374835E+02	5.51247E+01	1.2259E-01	1.6344E-01	1.1273E-01	1.401E-01	5.221E-03
2.538699E+02	5.51136E+01	1.0864E-01	1.3549E-01	1.0863E-01	1.161E-01	4.884E-03
2.713869E+02	5.51033E+01	9.6275E-02	1.1232E-01	1.0476E-01	9.619E-02	4.569E-03
2.901126E+02	5.50939E+01	8.5325E-02	9.3121E-02	1.0109E-01	7.972E-02	4.274E-03
3.101304E+02	5.50852E+01	7.5625E-02	7.7207E-02	9.7600E-02	6.606E-02	3.998E-03
3.315294E+02	5.50773E+01	6.7031E-02	6.4016E-02	9.4269E-02	5.475E-02	3.740E-03
3.544049E+02	5.50700E+01	5.9416E-02	5.3081E-02	9.1077E-02	4.537E-02	3.498E-03
3.788588E+02	5.50634E+01	5.2669E-02	4.4016E-02	8.8010E-02	3.760E-02	3.273E-03
4.050001E+02	5.50574E+01	4.6690E-02	3.6501E-02	8.5053E-02	3.116E-02	3.061E-03
4.329451E+02	5.50519E+01	4.1392E-02	3.0270E-02	8.2196E-02	2.582E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 401

Ba Z = 56

atomic weight = 1.373300E+02 g/mol, nominal density ρ (g/cm³) = 3.5000E+00

$\mu_{\text{atoms/atom}} = \mu(\text{cm}^2/\text{g}) \times 2.28042\text{E}+02$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 3.06417\text{E}+05$

* edges. Edge energies (keV):

K		3.74406E+00	L	I	5.98880E+00	L	II	5.62360E+00	L	III	5.24700E+00
M	I	1.29280E+00	M	II	1.13670E+00	M	III	1.06220E+00	M	IV	7.96100E-01
N	V	7.80700E-00	N	I	2.53000E-00	N	II	1.91800E-00	N	III	1.79700E-01
O	IV	9.25000E-02	O	V	8.99000E-02	O	I	3.91000E-02	O	II	1.66000E-02
	III	1.46000E-02									

Relativistic correction estimate $f_{\text{rel}}(\text{H82,3/5CL}) = -7.0761\text{E}-01$, $-4.3260\text{E}-01$ e/atom

Nuclear Thomson correction $f_{\text{NT}} = -1.2527\text{E}-02$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	1.43338E+01	0.0000E+00	0.0000E+00	1.2687E-04	0.000E+00	1.160E+02
1.142761E-02	1.39405E+01	0.0000E+00	0.0000E+00	1.7422E-04	0.000E+00	1.085E+02
1.221612E-02	1.33645E+01	0.0000E+00	0.0000E+00	2.3795E-04	0.000E+00	1.015E+02
1.305903E-02	1.24158E+01	0.0000E+00	0.0000E+00	3.2327E-04	0.000E+00	9.494E+01
1.396010E-02	1.03261E+01	0.0000E+00	0.0000E+00	4.3685E-04	0.000E+00	8.881E+01
1.430800E-02	8.32930E+00	0.0000E+00	0.0000E+00	4.8753E-04	0.000E+00	8.665E+01
1.452700E-02	4.62144E+00	0.0000E+00	0.0000E+00	5.2150E-04	0.000E+00	8.535E+01
1.458540E-02	1.64260E-01	0.0000E+00	0.0000E+00	5.3084E-04	0.000E+00	8.501E+01
1.467300E-02	4.86407E+00	8.7740E+00	1.8323E+05	5.4507E-04	0.000E+00	8.450E+01
1.489200E-02	8.93756E+00	8.4767E+00	1.7442E+05	5.8183E-04	0.000E+00	8.326E+01
1.492335E-02	9.23744E+00	8.4354E+00	1.7320E+05	5.8723E-04	0.000E+00	8.308E+01
1.595306E-02	1.27559E+01	7.2225E+00	1.3873E+05	7.8524E-04	0.000E+00	7.772E+01
1.626800E-02	1.25921E+01	6.8990E+00	1.2995E+05	8.5417E-04	0.000E+00	7.621E+01
1.651700E-02	1.11690E+01	6.6500E+00	1.2337E+05	9.1160E-04	0.000E+00	7.506E+01
1.658340E-02	9.00419E+00	6.5846E+00	1.2167E+05	9.2736E-04	0.000E+00	7.476E+01
1.668300E-02	1.15742E+01	1.0979E+01	2.0164E+05	9.5136E-04	0.000E+00	7.432E+01
1.693200E-02	1.40476E+01	1.0596E+01	1.9175E+05	1.0133E-03	0.000E+00	7.322E+01
1.705382E-02	1.46943E+01	1.0413E+01	1.8711E+05	1.0445E-03	0.000E+00	7.270E+01
1.823053E-02	1.77878E+01	8.8180E+00	1.4821E+05	1.3823E-03	0.000E+00	6.801E+01
1.948844E-02	1.92404E+01	7.3910E+00	1.1621E+05	1.8198E-03	0.000E+00	6.362E+01
2.083314E-02	2.00237E+01	6.1288E+00	9.0144E+04	2.3836E-03	0.000E+00	5.951E+01
2.227063E-02	2.04129E+01	5.0483E+00	6.9458E+04	3.1061E-03	0.000E+00	5.567E+01
2.380730E-02	2.05556E+01	4.1450E+00	5.3349E+04	4.0272E-03	0.000E+00	5.208E+01
2.545001E-02	2.05428E+01	3.4028E+00	4.0970E+04	5.1952E-03	0.000E+00	4.872E+01
2.720606E-02	2.04336E+01	2.8003E+00	3.1539E+04	6.6685E-03	0.000E+00	4.557E+01
2.908327E-02	2.02658E+01	2.3150E+00	2.4390E+04	8.5173E-03	0.000E+00	4.263E+01
3.109002E-02	2.00629E+01	1.9260E+00	1.8982E+04	1.0825E-02	0.000E+00	3.988E+01
3.323523E-02	1.98383E+01	1.6149E+00	1.4889E+04	1.3691E-02	0.000E+00	3.731E+01
3.552846E-02	1.95981E+01	1.3662E+00	1.1783E+04	1.7230E-02	0.000E+00	3.490E+01
3.797993E-02	1.93408E+01	1.1671E+00	9.4162E+03	2.1581E-02	0.000E+00	3.264E+01
3.831800E-02	1.93043E+01	1.1438E+00	9.1469E+03	2.2228E-02	0.000E+00	3.236E+01
3.890450E-02	1.92365E+01	1.1055E+00	8.7070E+03	2.3378E-02	0.000E+00	3.187E+01
3.906090E-02	1.92113E+01	1.0957E+00	8.5951E+03	2.3690E-02	0.000E+00	3.174E+01
3.929550E-02	1.91959E+01	1.0993E+00	8.5725E+03	2.4164E-02	0.000E+00	3.155E+01
3.988200E-02	1.91437E+01	1.0663E+00	8.1927E+03	2.5372E-02	0.000E+00	3.109E+01
4.060054E-02	1.90744E+01	1.0288E+00	7.7647E+03	2.6900E-02	0.000E+00	3.054E+01
4.340198E-02	1.87969E+01	9.0911E-01	6.4183E+03	3.3370E-02	0.000E+00	2.857E+01
4.639671E-02	1.84984E+01	8.1645E-01	5.3921E+03	4.1201E-02	0.000E+00	2.672E+01
4.959809E-02	1.81587E+01	7.4504E-01	4.6029E+03	5.0630E-02	0.000E+00	2.500E+01
5.302035E-02	1.77710E+01	6.9046E-01	3.9904E+03	6.1926E-02	0.000E+00	2.338E+01
5.667876E-02	1.73012E+01	6.4907E-01	3.5090E+03	7.5390E-02	0.000E+00	2.187E+01
6.058959E-02	1.67134E+01	6.1794E-01	3.1251E+03	9.1359E-02	0.000E+00	2.046E+01
6.477028E-02	1.59402E+01	5.9492E-01	2.8145E+03	1.1020E-01	0.000E+00	1.914E+01
6.923942E-02	1.48562E+01	5.7800E-01	2.5579E+03	1.3233E-01	0.000E+00	1.791E+01
7.401695E-02	1.31961E+01	5.6569E-01	2.3419E+03	1.5818E-01	0.000E+00	1.675E+01
7.912411E-02	1.02689E+01	5.5668E-01	2.1558E+03	1.8824E-01	0.000E+00	1.567E+01
8.458368E-02	3.36627E+00	5.4997E-01	1.9924E+03	2.2301E-01	0.000E+00	1.466E+01
8.810200E-02	-1.08739E+01	5.4668E-01	1.9014E+03	2.4680E-01	0.000E+00	1.407E+01
8.945050E-02	-3.35580E+01	5.4558E-01	1.8689E+03	2.5619E-01	0.000E+00	1.386E+01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
8.981010E-02	-6.36243E+01	5.4530E-01	1.8605E+03	2.5872E-01	0.000E+00	1.381E+01
9.041995E-02	-2.25694E+01	5.8904E+01	1.9961E+05	2.6304E-01	0.000E+00	1.371E+01
9.065000E-02	-1.48234E+01	5.6300E+01	1.9031E+05	2.6468E-01	0.000E+00	1.368E+01
9.169800E-02	-2.34496E+00	4.5897E+01	1.5337E+05	2.7218E-01	0.000E+00	1.352E+01
9.203750E-02	-4.39435E+00	4.2984E+01	1.4311E+05	2.7463E-01	0.000E+00	1.347E+01
9.240750E-02	-1.97423E+01	4.0033E+01	1.3275E+05	2.7731E-01	0.000E+00	1.342E+01
9.296250E-02	8.16737E+00	7.3068E+01	2.4084E+05	2.8136E-01	0.000E+00	1.334E+01
9.435000E-02	3.26022E+01	5.6274E+01	1.8276E+05	2.9157E-01	0.000E+00	1.314E+01
9.665893E-02	4.29232E+01	3.6802E+01	1.1666E+05	3.0889E-01	0.000E+00	1.283E+01
1.033284E-01	4.01512E+01	1.2040E+01	3.5704E+04	3.6115E-01	0.000E+00	1.200E+01
1.104581E-01	3.40274E+01	5.2283E+00	1.4504E+04	4.2043E-01	0.000E+00	1.122E+01
1.180797E-01	3.03135E+01	3.0158E+00	7.8261E+03	4.8734E-01	0.000E+00	1.050E+01
1.262272E-01	2.80185E+01	2.1488E+00	5.2163E+03	5.6250E-01	0.000E+00	9.822E+00
1.349368E-01	2.64755E+01	1.7723E+00	4.0246E+03	6.4650E-01	0.000E+00	9.188E+00
1.442475E-01	2.53420E+01	1.6134E+00	3.4274E+03	7.3992E-01	0.000E+00	8.595E+00
1.542005E-01	2.44300E+01	1.5720E+00	3.1237E+03	8.4333E-01	0.000E+00	8.040E+00
1.648404E-01	2.36073E+01	1.6076E+00	2.9884E+03	9.5721E-01	0.000E+00	7.521E+00
1.762144E-01	2.26102E+01	1.7039E+00	2.9629E+03	1.0820E+00	0.000E+00	7.036E+00
1.788015E-01	2.21082E+01	1.7322E+00	2.9685E+03	1.1108E+00	0.000E+00	6.934E+00
1.795203E-01	2.16302E+01	1.7405E+00	2.9707E+03	1.1188E+00	0.000E+00	6.906E+00
1.805985E-01	2.20139E+01	2.6163E+00	4.4390E+03	1.1308E+00	0.000E+00	6.865E+00
1.832940E-01	2.22568E+01	2.6598E+00	4.4465E+03	1.1610E+00	0.000E+00	6.764E+00
1.879640E-01	2.22328E+01	2.7399E+00	4.4666E+03	1.2135E+00	0.000E+00	6.596E+00
1.883732E-01	2.22205E+01	2.7472E+00	4.4687E+03	1.2181E+00	0.000E+00	6.582E+00
1.908410E-01	2.20787E+01	2.7919E+00	4.4828E+03	1.2460E+00	0.000E+00	6.497E+00
1.916082E-01	2.19129E+01	2.8061E+00	4.4876E+03	1.2547E+00	0.000E+00	6.471E+00
1.927590E-01	2.20571E+01	3.1367E+00	4.9863E+03	1.2677E+00	0.000E+00	6.432E+00
1.956360E-01	2.21562E+01	3.1955E+00	5.0050E+03	1.3004E+00	0.000E+00	6.337E+00
2.013709E-01	2.21642E+01	3.3173E+00	5.0478E+03	1.3658E+00	0.000E+00	6.157E+00
2.152655E-01	2.20525E+01	3.6322E+00	5.1701E+03	1.5253E+00	0.000E+00	5.760E+00
2.301188E-01	2.19070E+01	3.9889E+00	5.3115E+03	1.6966E+00	0.000E+00	5.388E+00
2.459970E-01	2.16928E+01	4.3789E+00	5.4545E+03	1.8798E+00	0.000E+00	5.040E+00
2.479400E-01	2.16416E+01	4.4266E+00	5.4706E+03	1.9021E+00	0.000E+00	5.001E+00
2.517350E-01	2.14250E+01	4.5193E+00	5.5010E+03	1.9458E+00	0.000E+00	4.925E+00
2.527470E-01	2.11727E+01	4.5439E+00	5.5088E+03	1.9574E+00	0.000E+00	4.905E+00
2.542650E-01	2.14262E+01	5.0752E+00	6.1162E+03	1.9748E+00	0.000E+00	4.876E+00
2.580600E-01	2.16501E+01	5.1705E+00	6.1394E+03	2.0183E+00	0.000E+00	4.804E+00
2.629708E-01	2.17706E+01	5.2924E+00	6.1668E+03	2.0745E+00	0.000E+00	4.715E+00
2.811158E-01	2.20321E+01	5.7251E+00	6.2404E+03	2.2806E+00	0.000E+00	4.410E+00
3.005128E-01	2.22810E+01	6.1432E+00	6.2639E+03	2.4975E+00	0.000E+00	4.126E+00
3.212482E-01	2.25628E+01	6.5280E+00	6.2266E+03	2.7246E+00	0.000E+00	3.859E+00
3.434143E-01	2.28757E+01	6.8637E+00	6.1243E+03	2.9612E+00	0.000E+00	3.610E+00
3.671099E-01	2.32063E+01	7.1372E+00	5.9572E+03	3.2062E+00	0.000E+00	3.377E+00
3.924405E-01	2.35321E+01	7.3318E+00	5.7247E+03	3.4586E+00	0.000E+00	3.159E+00
4.195189E-01	2.38184E+01	7.4408E+00	5.4348E+03	3.7171E+00	0.000E+00	2.955E+00
4.484657E-01	2.40286E+01	7.4684E+00	5.1028E+03	3.9804E+00	0.000E+00	2.765E+00
4.794098E-01	2.41237E+01	7.4226E+00	4.7442E+03	4.2469E+00	0.000E+00	2.586E+00
5.124891E-01	2.40578E+01	7.3142E+00	4.3732E+03	4.5150E+00	0.000E+00	2.419E+00
5.478508E-01	2.37758E+01	7.1546E+00	4.0016E+03	4.7829E+00	0.000E+00	2.263E+00
5.856525E-01	2.31801E+01	6.9554E+00	3.6391E+03	5.0489E+00	0.000E+00	2.117E+00
6.260625E-01	2.21087E+01	6.7270E+00	3.2924E+03	5.3111E+00	0.000E+00	1.980E+00
6.692609E-01	2.02275E+01	6.4787E+00	2.9662E+03	5.5676E+00	0.000E+00	1.853E+00
7.154399E-01	1.65998E+01	6.2181E+00	2.6632E+03	5.8165E+00	0.000E+00	1.733E+00
7.648052E-01	5.88726E+00	5.9507E+00	2.3841E+03	6.0558E+00	0.000E+00	1.621E+00
7.650860E-01	5.75176E+00	5.9492E+00	2.3827E+03	6.0571E+00	0.000E+00	1.621E+00
7.767965E-01	-4.33866E+00	5.8879E+00	2.3225E+03	6.1101E+00	0.000E+00	1.596E+00
7.801780E-01	-1.77417E+00	5.8703E+00	2.3056E+03	6.1251E+00	0.000E+00	1.589E+00
7.846035E-01	-5.78321E+00	2.5816E+01	1.0082E+04	6.1446E+00	0.000E+00	1.580E+00
7.921195E-01	-2.80807E+00	2.5455E+01	9.8467E+03	6.1773E+00	0.000E+00	1.565E+00
7.953039E-01	-7.78728E+00	2.5304E+01	9.7494E+03	6.1910E+00	0.000E+00	1.559E+00
7.963140E-01	-1.28192E+01	3.8538E+01	1.4829E+04	6.1953E+00	0.000E+00	1.557E+00
8.000805E-01	1.21160E+00	3.8257E+01	1.4652E+04	6.2113E+00	0.000E+00	1.550E+00
8.120220E-01	1.07864E+01	3.7389E+01	1.4109E+04	6.2611E+00	0.000E+00	1.527E+00
8.175768E-01	1.33265E+01	3.6997E+01	1.3866E+04	6.2839E+00	0.000E+00	1.516E+00
8.739896E-01	2.58483E+01	3.3381E+01	1.1703E+04	6.4988E+00	0.000E+00	1.419E+00

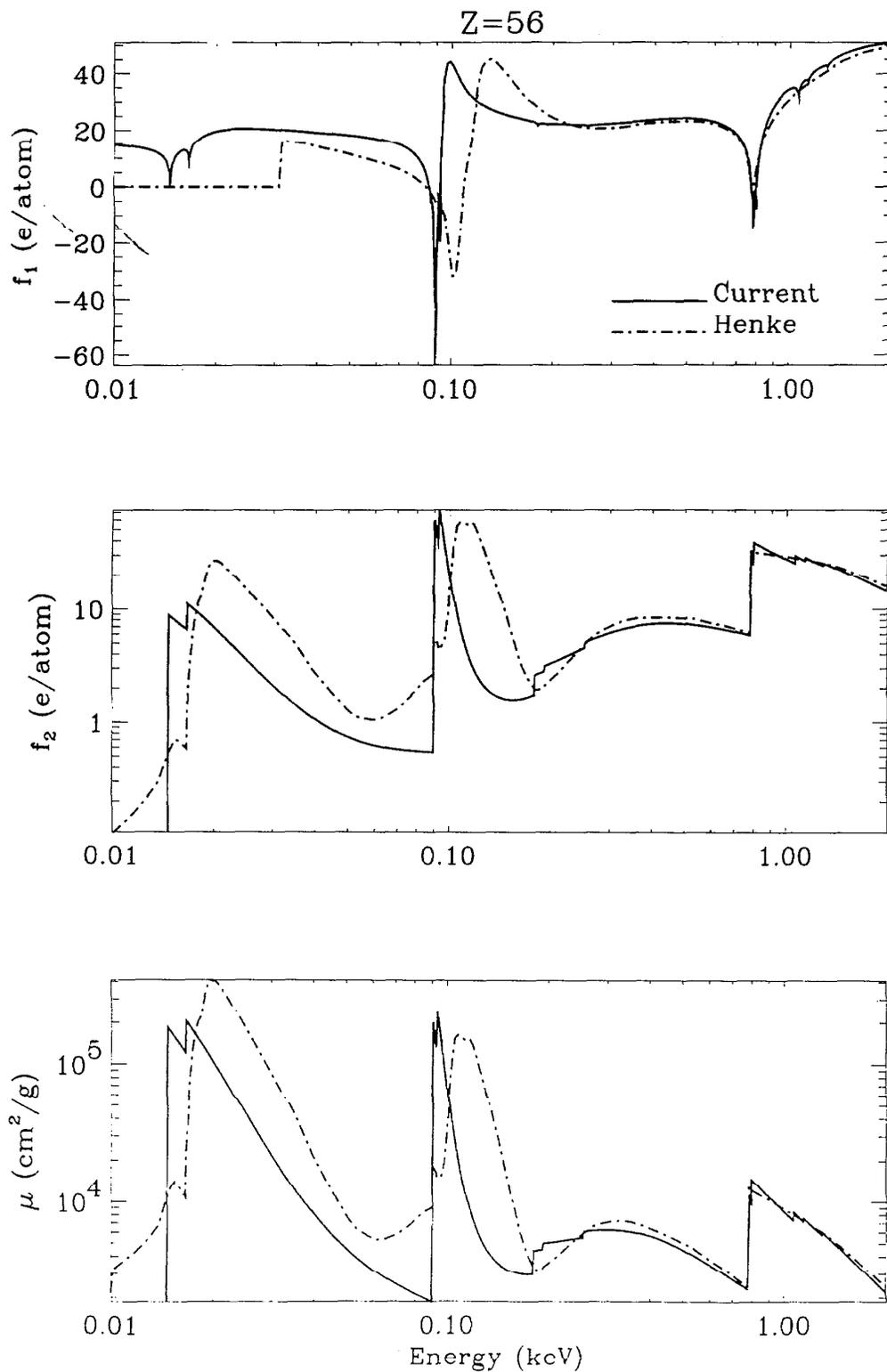
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 403

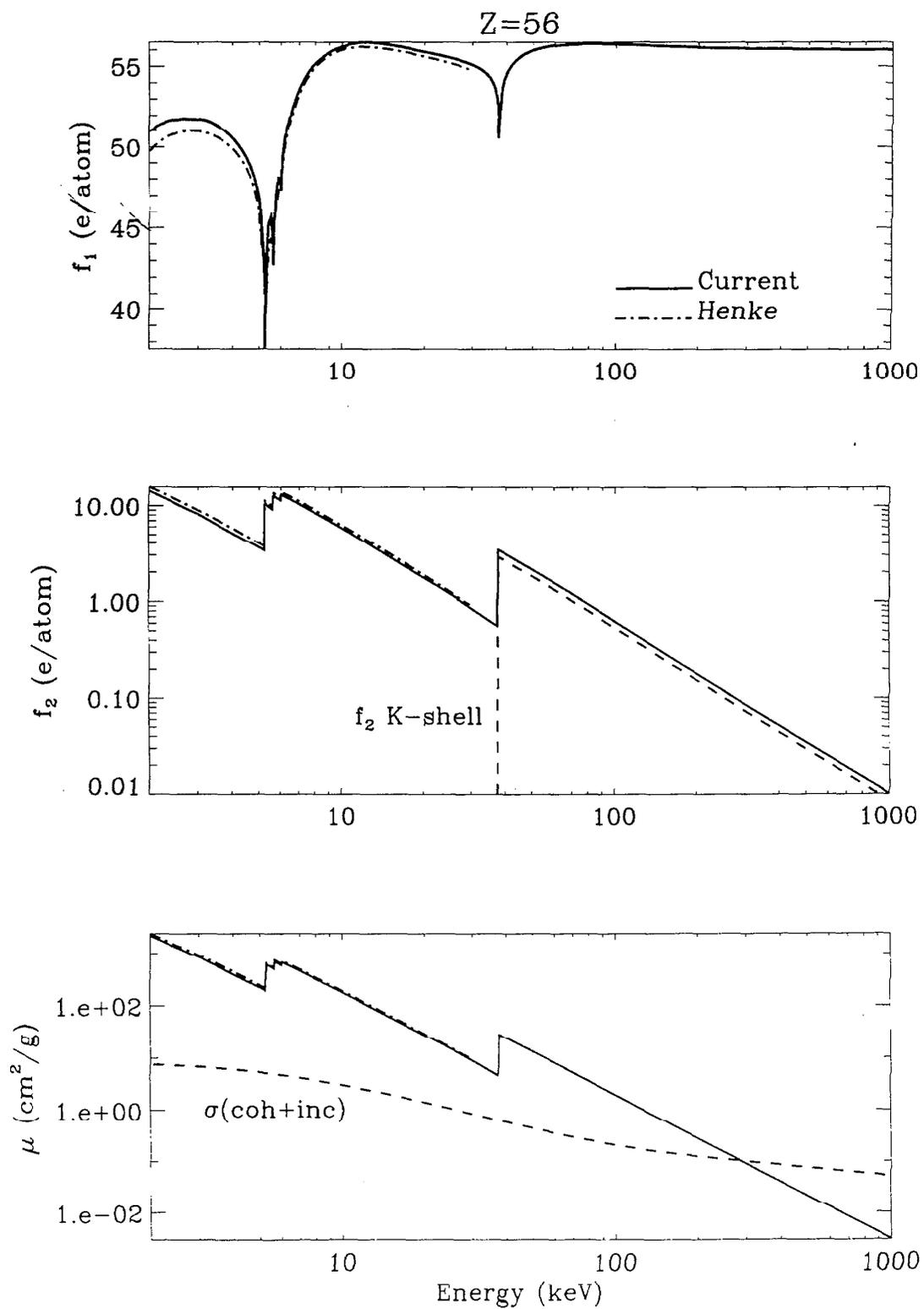
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
9.342948E-01	3.13908E+01	3.0314E+01	9.9420E+03	6.6989E+00	0.000E+00	1.327E+00
9.987612E-01	3.43674E+01	2.7662E+01	8.4865E+03	6.8826E+00	0.000E+00	1.241E+00
1.040956E+00	3.47296E+01	2.6088E+01	7.6794E+03	6.9877E+00	0.000E+00	1.191E+00
1.056889E+00	3.34815E+01	2.5535E+01	7.4034E+03	7.0245E+00	0.000E+00	1.173E+00
1.061138E+00	3.15154E+01	2.5392E+01	7.3322E+03	7.0340E+00	0.000E+00	1.168E+00
1.067676E+00	3.38505E+01	2.9274E+01	8.4016E+03	7.0485E+00	0.000E+00	1.161E+00
1.083444E+00	3.60736E+01	2.8639E+01	8.0995E+03	7.0825E+00	0.000E+00	1.144E+00
1.113966E+00	3.76618E+01	2.7474E+01	7.5573E+03	7.1442E+00	0.000E+00	1.113E+00
1.131017E+00	3.76671E+01	2.6916E+01	7.2922E+03	7.1765E+00	0.000E+00	1.096E+00
1.135563E+00	3.69535E+01	2.6773E+01	7.2244E+03	7.1849E+00	0.000E+00	1.092E+00
1.141345E+00	3.79670E+01	2.8357E+01	7.6130E+03	7.1953E+00	0.000E+00	1.086E+00
1.142384E+00	3.81225E+01	2.8322E+01	7.5966E+03	7.1972E+00	0.000E+00	1.085E+00
1.159434E+00	3.95218E+01	2.7758E+01	7.3358E+03	7.2270E+00	0.000E+00	1.069E+00
1.220098E+00	4.17996E+01	2.6003E+01	6.5303E+03	7.3219E+00	0.000E+00	1.016E+00
1.266944E+00	4.27472E+01	2.4880E+01	6.0174E+03	7.3842E+00	0.000E+00	9.786E-01
1.286336E+00	4.27243E+01	2.4455E+01	5.8254E+03	7.4073E+00	0.000E+00	9.639E-01
1.291507E+00	4.22596E+01	2.4345E+01	5.7760E+03	7.4132E+00	0.000E+00	9.600E-01
1.299264E+00	4.30282E+01	2.5333E+01	5.9745E+03	7.4219E+00	0.000E+00	9.543E-01
1.304285E+00	4.33576E+01	2.5227E+01	5.9265E+03	7.4274E+00	0.000E+00	9.506E-01
1.318656E+00	4.39869E+01	2.4929E+01	5.7927E+03	7.4427E+00	0.000E+00	9.402E-01
1.394281E+00	4.59814E+01	2.3285E+01	5.1173E+03	7.5111E+00	0.000E+00	8.892E-01
1.490486E+00	4.75979E+01	2.1370E+01	4.3933E+03	7.5723E+00	0.000E+00	8.318E-01
1.593329E+00	4.87836E+01	1.9565E+01	3.7626E+03	7.6109E+00	0.000E+00	7.781E-01
1.703269E+00	4.96753E+01	1.7896E+01	3.2195E+03	7.6268E+00	0.000E+00	7.279E-01
1.820795E+00	5.03359E+01	1.6327E+01	2.7476E+03	7.6199E+00	0.000E+00	6.809E-01
1.946430E+00	5.08105E+01	1.4895E+01	2.3449E+03	7.5908E+00	0.000E+00	6.370E-01
2.080733E+00	5.11484E+01	1.3600E+01	2.0028E+03	7.5397E+00	0.000E+00	5.959E-01
2.224304E+00	5.14850E+01	1.2407E+01	1.7092E+03	7.4676E+00	0.000E+00	5.574E-01
2.377781E+00	5.16848E+01	1.1310E+01	1.4574E+03	7.3752E+00	0.000E+00	5.214E-01
2.541848E+00	5.17595E+01	1.0315E+01	1.2435E+03	7.2635E+00	0.000E+00	4.878E-01
2.717235E+00	5.17921E+01	9.4155E+00	1.0618E+03	7.1337E+00	0.000E+00	4.563E-01
2.904724E+00	5.17628E+01	8.6035E+00	9.0757E+02	6.9870E+00	0.000E+00	4.268E-01
3.105150E+00	5.17419E+01	7.8048E+00	7.7018E+02	6.8250E+00	0.000E+00	3.993E-01
3.319406E+00	5.15927E+01	6.9934E+00	6.4556E+02	6.6489E+00	0.000E+00	3.735E-01
3.548445E+00	5.13222E+01	6.2655E+00	5.4105E+02	6.4640E+00	0.000E+00	3.494E-01
3.793288E+00	5.09469E+01	5.6213E+00	4.5408E+02	6.2610E+00	0.000E+00	3.269E-01
4.055024E+00	5.04516E+01	5.0525E+00	3.8179E+02	6.0522E+00	0.000E+00	3.058E-01
4.334821E+00	4.97836E+01	4.5498E+00	3.2161E+02	5.8357E+00	0.000E+00	2.860E-01
4.633924E+00	4.88026E+01	4.1024E+00	2.7127E+02	5.6130E+00	0.000E+00	2.676E-01
4.953664E+00	4.69999E+01	3.6853E+00	2.2796E+02	5.3856E+00	0.000E+00	2.503E-01
5.142060E+00	4.45430E+01	3.4671E+00	2.0661E+02	5.2569E+00	0.000E+00	2.411E-01
5.220765E+00	4.13094E+01	3.3825E+00	1.9853E+02	5.2043E+00	0.000E+00	2.375E-01
5.241753E+00	3.75721E+01	3.3605E+00	1.9645E+02	5.1904E+00	0.000E+00	2.365E-01
5.273235E+00	4.12613E+01	1.0586E+01	6.1513E+02	5.1696E+00	0.000E+00	2.351E-01
5.295467E+00	4.26868E+01	1.0489E+01	6.0695E+02	5.1550E+00	0.000E+00	2.341E-01
5.351940E+00	4.43928E+01	1.0250E+01	5.8683E+02	5.1181E+00	0.000E+00	2.317E-01
5.511128E+00	4.56654E+01	9.6197E+00	5.3485E+02	5.0161E+00	0.000E+00	2.250E-01
5.595482E+00	4.47233E+01	9.3495E+00	5.1199E+02	4.9632E+00	0.000E+00	2.216E-01
5.617976E+00	4.30095E+01	9.2804E+00	5.0618E+02	4.9492E+00	0.000E+00	2.207E-01
5.651718E+00	4.50562E+01	1.2800E+01	6.9398E+02	4.9283E+00	0.000E+00	2.194E-01
5.660855E+00	4.54367E+01	1.2760E+01	6.9066E+02	4.9226E+00	0.000E+00	2.190E-01
5.736072E+00	4.70616E+01	1.2435E+01	6.6427E+02	4.8766E+00	0.000E+00	2.161E-01
5.869024E+00	4.81910E+01	1.1901E+01	6.2132E+02	4.7966E+00	0.000E+00	2.113E-01
5.958856E+00	4.83966E+01	1.1578E+01	5.9535E+02	4.7436E+00	0.000E+00	2.081E-01
5.982811E+00	4.73384E+01	1.1497E+01	5.8882E+02	4.7296E+00	0.000E+00	2.072E-01
6.018744E+00	4.84624E+01	1.3172E+01	6.7059E+02	4.7088E+00	0.000E+00	2.060E-01
6.051453E+00	4.90789E+01	1.3061E+01	6.6133E+02	4.6899E+00	0.000E+00	2.049E-01
6.108576E+00	4.97589E+01	1.2872E+01	6.4567E+02	4.6571E+00	0.000E+00	2.030E-01
6.469004E+00	5.19659E+01	1.1807E+01	5.5924E+02	4.4579E+00	0.000E+00	1.917E-01
6.915365E+00	5.34251E+01	1.0692E+01	4.7375E+02	4.2280E+00	0.000E+00	1.793E-01
7.392525E+00	5.43968E+01	9.6457E+00	3.9981E+02	4.0012E+00	0.000E+00	1.677E-01
7.902609E+00	5.50660E+01	8.6788E+00	3.3651E+02	3.7784E+00	0.000E+00	1.569E-01
8.447890E+00	5.55333E+01	7.8032E+00	2.8303E+02	3.5606E+00	0.000E+00	1.468E-01
9.030794E+00	5.58880E+01	7.0067E+00	2.3774E+02	3.3485E+00	0.000E+00	1.373E-01
9.653919E+00	5.61120E+01	6.2554E+00	1.9855E+02	3.1428E+00	0.000E+00	1.284E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.032004E+01	5.62453E+01	5.5897E+00	1.6597E+02	2.9441E+00	0.000E+00	1.201E-01
1.103212E+01	5.63911E+01	4.9844E+00	1.3844E+02	2.7527E+00	0.000E+00	1.124E-01
1.179334E+01	5.64523E+01	4.4369E+00	1.1528E+02	2.5691E+00	0.000E+00	1.051E-01
1.260708E+01	5.64722E+01	3.9400E+00	9.5763E+01	2.3936E+00	0.000E+00	9.834E-02
1.347697E+01	5.64235E+01	3.4989E+00	7.9553E+01	2.2263E+00	0.000E+00	9.200E-02
1.440688E+01	5.63541E+01	3.1098E+00	6.6143E+01	2.0674E+00	0.000E+00	8.606E-02
1.540095E+01	5.62713E+01	2.7659E+00	5.5031E+01	1.9170E+00	0.000E+00	8.050E-02
1.646362E+01	5.61795E+01	2.4620E+00	4.5823E+01	1.7749E+00	0.000E+00	7.531E-02
1.759961E+01	5.60818E+01	2.1935E+00	3.8190E+01	1.6411E+00	0.000E+00	7.045E-02
1.881398E+01	5.59801E+01	1.9560E+00	3.1858E+01	1.5155E+00	0.000E+00	6.590E-02
2.011215E+01	5.58754E+01	1.7459E+00	2.6599E+01	1.3979E+00	0.000E+00	6.165E-02
2.149988E+01	5.57679E+01	1.5597E+00	2.2229E+01	1.2881E+00	0.000E+00	5.767E-02
2.298338E+01	5.56571E+01	1.3938E+00	1.8582E+01	1.1858E+00	0.000E+00	5.395E-02
2.456923E+01	5.55396E+01	1.2429E+00	1.5501E+01	1.0907E+00	0.000E+00	5.046E-02
2.626450E+01	5.54174E+01	1.1072E+00	1.2917E+01	1.0026E+00	0.000E+00	4.721E-02
2.807676E+01	5.52621E+01	9.7560E-01	1.0647E+01	9.2114E-01	0.000E+00	4.416E-02
3.001405E+01	5.50700E+01	8.5752E-01	8.7545E+00	8.4595E-01	0.000E+00	4.131E-02
3.208502E+01	5.48096E+01	7.5436E-01	7.2043E+00	7.7673E-01	0.000E+00	3.864E-02
3.429889E+01	5.43908E+01	6.6418E-01	5.9336E+00	7.1312E-01	0.000E+00	3.615E-02
3.666551E+01	5.32415E+01	5.8526E-01	4.8911E+00	6.5480E-01	0.000E+00	3.381E-02
3.669179E+01	5.32120E+01	5.8447E-01	4.8810E+00	6.5420E-01	0.000E+00	3.379E-02
3.725340E+01	5.19948E+01	5.6795E-01	4.6715E+00	6.4164E-01	0.000E+00	3.328E-02
3.740316E+01	5.05352E+01	5.6367E-01	4.6177E+00	6.3836E-01	0.000E+00	3.315E-02
3.762780E+01	5.20120E+01	3.4315E+00	2.7944E+01	6.3351E-01	2.341E+01	3.295E-02
3.818941E+01	5.33471E+01	3.3512E+00	2.6889E+01	6.2166E-01	2.254E+01	3.247E-02
3.919543E+01	5.41930E+01	3.2150E+00	2.5133E+01	6.0143E-01	2.110E+01	3.163E-02
4.189992E+01	5.51167E+01	2.8831E+00	2.1084E+01	5.5257E-01	1.775E+01	2.959E-02
4.479101E+01	5.55719E+01	2.5829E+00	1.7670E+01	5.0820E-01	1.492E+01	2.768E-02
4.788159E+01	5.58522E+01	2.3128E+00	1.4801E+01	4.6772E-01	1.252E+01	2.589E-02
5.118542E+01	5.60387E+01	2.0659E+00	1.2367E+01	4.3092E-01	1.048E+01	2.422E-02
5.471721E+01	5.61622E+01	1.8434E+00	1.0323E+01	3.9751E-01	8.762E+00	2.266E-02
5.849270E+01	5.62448E+01	1.6446E+00	8.6151E+00	3.6722E-01	7.321E+00	2.120E-02
6.252870E+01	5.62991E+01	1.4669E+00	7.1886E+00	3.3979E-01	6.115E+00	1.983E-02
6.684318E+01	5.63333E+01	1.3083E+00	5.9975E+00	3.1497E-01	5.107E+00	1.855E-02
7.145536E+01	5.63534E+01	1.1668E+00	5.0034E+00	2.9252E-01	4.263E+00	1.735E-02
7.638578E+01	5.63946E+01	1.0396E+00	4.1703E+00	2.7225E-01	3.555E+00	1.623E-02
8.165640E+01	5.63972E+01	9.2298E-01	3.4635E+00	2.5393E-01	2.953E+00	1.518E-02
8.729069E+01	5.63892E+01	8.1666E-01	2.8667E+00	2.3739E-01	2.446E+00	1.420E-02
9.331374E+01	5.63757E+01	7.2265E-01	2.3730E+00	2.2244E-01	2.026E+00	1.329E-02
9.975239E+01	5.63589E+01	6.3952E-01	1.9645E+00	2.0894E-01	1.678E+00	1.243E-02
1.066353E+02	5.63400E+01	5.6600E-01	1.6264E+00	1.9673E-01	1.390E+00	1.163E-02
1.139931E+02	5.63200E+01	5.0098E-01	1.3466E+00	1.8567E-01	1.151E+00	1.088E-02
1.218587E+02	5.62996E+01	4.4346E-01	1.1151E+00	1.7565E-01	9.536E-01	1.017E-02
1.302669E+02	5.62792E+01	3.9257E-01	9.2341E-01	1.6655E-01	7.898E-01	9.518E-03
1.392553E+02	5.62592E+01	3.4755E-01	7.6474E-01	1.5827E-01	6.542E-01	8.903E-03
1.488640E+02	5.62398E+01	3.0771E-01	6.3338E-01	1.5071E-01	5.419E-01	8.329E-03
1.591356E+02	5.62212E+01	2.7246E-01	5.2462E-01	1.4380E-01	4.488E-01	7.791E-03
1.701159E+02	5.62034E+01	2.4145E-01	4.3491E-01	1.3745E-01	3.721E-01	7.288E-03
1.818539E+02	5.61868E+01	2.1406E-01	3.6068E-01	1.3161E-01	3.086E-01	6.818E-03
1.944018E+02	5.61713E+01	1.8978E-01	2.9914E-01	1.2621E-01	2.559E-01	6.378E-03
2.078156E+02	5.61568E+01	1.6827E-01	2.4811E-01	1.2120E-01	2.122E-01	5.966E-03
2.221548E+02	5.61433E+01	1.4921E-01	2.0580E-01	1.1653E-01	1.760E-01	5.581E-03
2.374835E+02	5.61308E+01	1.3231E-01	1.7071E-01	1.1216E-01	1.460E-01	5.221E-03
2.538699E+02	5.61192E+01	1.1733E-01	1.4162E-01	1.0805E-01	1.211E-01	4.884E-03
2.713369E+02	5.61085E+01	1.0406E-01	1.1749E-01	1.0417E-01	1.004E-01	4.569E-03
2.901126E+02	5.60987E+01	9.2287E-02	9.7474E-02	1.0049E-01	8.328E-02	4.274E-03
3.101304E+02	5.60897E+01	8.1854E-02	8.0874E-02	9.6989E-02	6.907E-02	3.998E-03
3.315294E+02	5.60814E+01	7.2604E-02	6.7104E-02	9.3645E-02	5.728E-02	3.740E-03
3.544049E+02	5.60738E+01	6.4402E-02	5.5682E-02	9.0438E-02	4.751E-02	3.498E-03
3.788588E+02	5.60669E+01	5.7129E-02	4.6206E-02	8.7353E-02	3.940E-02	3.273E-03
4.050001E+02	5.60606E+01	5.0681E-02	3.8344E-02	8.4377E-02	3.268E-02	3.061E-03
4.329451E+02	5.60548E+01	4.4962E-02	3.1822E-02	8.1498E-02	2.710E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 407

La Z = 57

atomic weight = 1.389055E+02 g/mol, nominal density ρ (g/cm³) = 6.1270E+00

$\mu_{\text{ph}}(\text{atoms}) = \mu(\text{cm}^2/\text{g}) \times 2.30658E+02$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 3.02942E+05$

* edges. Edge energies (keV):

K		3.89246E+00	L	I	6.26630E+00	L	II	5.89060E+00	L	III	5.48270E+00
M	I	1.36130E+00	M	II	1.20440E+00	M	III	1.12340E+00	M	IV	8.48500E-01
N	V	8.31700E-00	N	I	2.70400E-00	N	II	2.05800E-00	N	III	1.91400E-01
O	IV	9.89000E-02	O	V	9.89000E-02	O	I	3.23000E-02	O	II	1.44000E-02
	III	1.44000E-02									

Relativistic correction estimate $f_{\text{rel}}(\text{H82,3/SCL}) = -7.4022E-01, -4.5180E-01$ e/atom

Nuclear Thomson correction $f_{\text{NT}} = -1.2831E-02$ e/atom

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	1.87089E+01	0.0000E+00	0.0000E+00	1.5622E-04	0.000E+00	1.160E+02
1.142761E-02	1.83468E+01	0.0000E+00	0.0000E+00	2.1337E-04	0.000E+00	1.085E+02
1.221612E-02	1.77981E+01	0.0000E+00	0.0000E+00	2.8990E-04	0.000E+00	1.015E+02
1.305903E-02	1.68371E+01	0.0000E+00	0.0000E+00	3.9182E-04	0.000E+00	9.494E+01
1.396010E-02	1.43197E+01	0.0000E+00	0.0000E+00	5.2682E-04	0.000E+00	8.881E+01
1.411200E-02	1.32810E+01	0.0000E+00	0.0000E+00	5.5246E-04	0.000E+00	8.786E+01
1.432800E-02	9.70715E+00	0.0000E+00	0.0000E+00	5.9044E-04	0.000E+00	8.653E+01
1.438560E-02	5.39845E+00	0.0000E+00	0.0000E+00	6.0088E-04	0.000E+00	8.619E+01
1.447200E-02	9.90333E+00	8.4982E+00	1.7789E+05	6.1677E-04	0.000E+00	8.567E+01
1.468800E-02	1.38687E+01	8.3345E+00	1.7190E+05	6.5780E-04	0.000E+00	8.441E+01
1.492335E-02	1.56489E+01	8.1623E+00	1.6569E+05	7.0467E-04	0.000E+00	8.308E+01
1.595306E-02	1.90550E+01	7.4767E+00	1.4198E+05	9.3772E-04	0.000E+00	7.772E+01
1.705382E-02	2.08265E+01	6.7507E+00	1.1992E+05	1.2415E-03	0.000E+00	7.270E+01
1.823053E-02	2.19681E+01	5.9723E+00	9.9244E+04	1.6352E-03	0.000E+00	6.801E+01
1.948844E-02	2.27190E+01	5.2034E+00	8.0886E+04	2.1430E-03	0.000E+00	6.362E+01
2.083314E-02	2.31990E+01	4.4843E+00	6.5208E+04	2.7944E-03	0.000E+00	5.951E+01
2.227063E-02	2.34860E+01	3.8371E+00	5.2195E+04	3.6256E-03	0.000E+00	5.567E+01
2.380730E-02	2.36361E+01	3.2705E+00	4.1616E+04	4.6806E-03	0.000E+00	5.208E+01
2.545001E-02	2.36908E+01	2.7843E+00	3.3142E+04	6.0129E-03	0.000E+00	4.872E+01
2.720606E-02	2.36802E+01	2.3731E+00	2.6424E+04	7.6865E-03	0.000E+00	4.557E+01
2.908327E-02	2.36248E+01	2.0287E+00	2.1132E+04	9.7780E-03	0.000E+00	4.263E+01
3.109002E-02	2.35359E+01	1.7424E+00	1.6978E+04	1.2378E-02	0.000E+00	3.988E+01
3.165400E-02	2.35047E+01	1.6740E+00	1.6021E+04	1.3180E-02	0.000E+00	3.917E+01
3.213850E-02	2.34686E+01	1.6189E+00	1.5260E+04	1.3893E-02	0.000E+00	3.858E+01
3.226770E-02	2.34467E+01	1.6048E+00	1.5066E+04	1.4087E-02	0.000E+00	3.842E+01
3.246150E-02	2.34528E+01	1.6149E+00	1.5071E+04	1.4382E-02	0.000E+00	3.819E+01
3.294600E-02	2.34432E+01	1.5665E+00	1.4404E+04	1.5134E-02	0.000E+00	3.763E+01
3.323523E-02	2.34330E+01	1.5389E+00	1.4027E+04	1.5595E-02	0.000E+00	3.731E+01
3.552846E-02	2.33376E+01	1.3514E+00	1.1523E+04	1.9554E-02	0.000E+00	3.490E+01
3.797993E-02	2.32320E+01	1.1995E+00	9.5679E+03	2.4401E-02	0.000E+00	3.264E+01
4.060054E-02	2.31224E+01	1.0768E+00	8.0344E+03	3.0305E-02	0.000E+00	3.054E+01
4.340198E-02	2.30200E+01	9.7787E-01	6.8254E+03	3.7462E-02	0.000E+00	2.857E+01
4.639671E-02	2.29042E+01	8.9840E-01	5.8660E+03	4.6094E-02	0.000E+00	2.672E+01
4.959809E-02	2.27831E+01	8.3474E-01	5.0985E+03	5.6452E-02	0.000E+00	2.500E+01
5.302035E-02	2.26534E+01	7.8385E-01	4.4787E+03	6.8820E-02	0.000E+00	2.338E+01
5.667876E-02	2.25101E+01	7.4326E-01	3.9726E+03	8.3515E-02	0.000E+00	2.187E+01
6.058959E-02	2.23459E+01	7.1114E-01	3.5556E+03	1.0089E-01	0.000E+00	2.046E+01
6.477028E-02	2.21501E+01	6.8620E-01	3.2095E+03	1.2133E-01	0.000E+00	1.914E+01
6.923942E-02	2.19053E+01	6.6685E-01	2.9177E+03	1.4525E-01	0.000E+00	1.791E+01
7.401695E-02	2.15806E+01	6.5186E-01	2.6680E+03	1.7313E-01	0.000E+00	1.675E+01
7.912411E-02	2.11153E+01	6.4020E-01	2.4511E+03	2.0544E-01	0.000E+00	1.567E+01
8.458368E-02	2.03664E+01	6.3111E-01	2.2604E+03	2.4272E-01	0.000E+00	1.466E+01
9.041995E-02	1.88770E+01	6.2394E-01	2.0904E+03	2.8551E-01	0.000E+00	1.371E+01
9.665893E-02	1.33358E+01	6.1820E-01	1.9375E+03	3.3440E-01	0.000E+00	1.283E+01
9.692200E-02	1.26877E+01	6.1799E-01	1.9316E+03	3.3653E-01	0.000E+00	1.279E+01
9.840550E-02	4.27129E+00	6.1685E-01	1.8990E+03	3.4864E-01	0.000E+00	1.260E+01
9.880110E-02	-7.36267E+00	6.1656E-01	1.8905E+03	3.5189E-01	0.000E+00	1.255E+01
9.939450E-02	7.57660E+00	2.4131E+01	7.3550E+04	3.5680E-01	0.000E+00	1.247E+01
1.008780E-01	2.01159E+01	1.9837E+01	5.9572E+04	3.6918E-01	0.000E+00	1.229E+01
1.033284E-01	2.61204E+01	1.4480E+01	4.2453E+04	3.8998E-01	0.000E+00	1.200E+01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.104581E-01	2.83400E+01	6.2404E+00	1.7115E+04	4.5287E-01	0.000E+00	1.122E+01
1.180797E-01	2.70378E+01	3.3591E+00	8.6181E+03	5.2367E-01	0.000E+00	1.050E+01
1.262272E-01	2.59494E+01	2.2914E+00	5.4993E+03	6.0301E-01	0.000E+00	9.822E+00
1.349368E-01	2.51633E+01	1.8404E+00	4.1318E+03	6.9148E-01	0.000E+00	9.188E+00
1.442475E-01	2.45597E+01	1.6467E+00	3.4582E+03	7.8966E-01	0.000E+00	8.595E+00
1.542005E-01	2.40505E+01	1.5839E+00	3.1118E+03	8.9808E-01	0.000E+00	8.040E+00
1.648404E-01	2.35728E+01	1.6033E+00	2.9465E+03	1.0172E+00	0.000E+00	7.521E+00
1.762144E-01	2.30570E+01	1.6852E+00	2.8971E+03	1.1475E+00	0.000E+00	7.036E+00
1.875720E-01	2.23145E+01	1.8119E+00	2.9263E+03	1.2799E+00	0.000E+00	6.610E+00
1.883732E-01	2.22201E+01	1.8222E+00	2.9305E+03	1.2894E+00	0.000E+00	6.582E+00
1.904430E-01	2.18103E+01	1.8498E+00	2.9424E+03	1.3137E+00	0.000E+00	6.510E+00
1.912086E-01	2.13010E+01	1.8602E+00	2.9472E+03	1.3227E+00	0.000E+00	6.484E+00
1.923570E-01	2.17474E+01	2.8253E+00	4.4495E+03	1.3363E+00	0.000E+00	6.446E+00
1.952280E-01	2.20741E+01	2.8775E+00	4.4650E+03	1.3702E+00	0.000E+00	6.351E+00
2.013709E-01	2.21454E+01	2.9952E+00	4.5060E+03	1.4429E+00	0.000E+00	6.157E+00
2.016840E-01	2.21410E+01	3.0014E+00	4.5084E+03	1.4467E+00	0.000E+00	6.147E+00
2.047710E-01	2.20171E+01	3.0637E+00	4.5325E+03	1.4834E+00	0.000E+00	6.055E+00
2.055942E-01	2.18525E+01	3.0806E+00	4.5393E+03	1.4932E+00	0.000E+00	6.031E+00
2.068290E-01	2.20210E+01	3.4333E+00	5.0288E+03	1.5079E+00	0.000E+00	5.995E+00
2.099160E-01	2.21656E+01	3.5027E+00	5.0549E+03	1.5446E+00	0.000E+00	5.906E+00
2.152655E-01	2.22440E+01	3.6262E+00	5.1032E+03	1.6085E+00	0.000E+00	5.760E+00
2.301188E-01	2.22964E+01	3.9852E+00	5.2463E+03	1.7860E+00	0.000E+00	5.388E+00
2.459970E-01	2.22928E+01	4.3834E+00	5.3981E+03	1.9753E+00	0.000E+00	5.040E+00
2.629708E-01	2.22043E+01	4.8098E+00	5.5409E+03	2.1764E+00	0.000E+00	4.715E+00
2.649920E-01	2.21670E+01	4.8600E+00	5.5560E+03	2.2002E+00	0.000E+00	4.679E+00
2.690480E-01	2.19707E+01	4.9598E+00	5.5846E+03	2.2479E+00	0.000E+00	4.608E+00
2.701296E-01	2.17154E+01	4.9863E+00	5.5920E+03	2.2606E+00	0.000E+00	4.590E+00
2.717520E-01	2.19911E+01	5.5410E+00	6.1769E+03	2.2796E+00	0.000E+00	4.562E+00
2.758080E-01	2.22524E+01	5.6421E+00	6.1972E+03	2.3270E+00	0.000E+00	4.495E+00
2.811158E-01	2.24140E+01	5.7724E+00	6.2206E+03	2.3888E+00	0.000E+00	4.410E+00
3.005128E-01	2.27965E+01	6.2234E+00	6.2737E+03	2.6119E+00	0.000E+00	4.126E+00
3.212482E-01	2.31627E+01	6.6495E+00	6.2705E+03	2.8452E+00	0.000E+00	3.859E+00
3.434143E-01	2.35533E+01	7.0310E+00	6.2024E+03	3.0878E+00	0.000E+00	3.610E+00
3.671099E-01	2.39653E+01	7.3528E+00	6.0676E+03	3.3387E+00	0.000E+00	3.377E+00
3.924405E-01	2.43836E+01	7.6033E+00	5.8693E+03	3.5968E+00	0.000E+00	3.159E+00
4.195189E-01	2.47866E+01	7.7705E+00	5.6112E+03	3.8607E+00	0.000E+00	2.955E+00
4.484657E-01	2.51400E+01	7.8465E+00	5.3003E+03	4.1291E+00	0.000E+00	2.765E+00
4.794098E-01	2.54068E+01	7.8382E+00	4.9530E+03	4.4004E+00	0.000E+00	2.586E+00
5.124891E-01	2.55490E+01	7.7563E+00	4.5849E+03	4.6730E+00	0.000E+00	2.419E+00
5.478508E-01	2.55227E+01	7.6133E+00	4.2099E+03	4.9450E+00	0.000E+00	2.263E+00
5.856525E-01	2.52763E+01	7.4219E+00	3.8391E+03	5.2147E+00	0.000E+00	2.117E+00
6.260625E-01	2.47077E+01	7.1940E+00	3.4811E+03	5.4802E+00	0.000E+00	1.980E+00
6.692609E-01	2.36639E+01	6.9402E+00	3.1415E+03	5.7395E+00	0.000E+00	1.853E+00
7.154399E-01	2.18056E+01	6.6701E+00	2.8243E+03	5.9908E+00	0.000E+00	1.733E+00
7.648052E-01	1.81710E+01	6.3909E+00	2.5315E+03	6.2322E+00	0.000E+00	1.621E+00
8.150660E-01	7.99874E+00	6.1211E+00	2.2751E+03	6.4515E+00	0.000E+00	1.521E+00
8.175768E-01	6.80890E+00	6.1080E+00	2.2632E+03	6.4618E+00	0.000E+00	1.516E+00
8.275415E-01	-1.69126E+00	6.0566E+00	2.2172E+03	6.5021E+00	0.000E+00	1.498E+00
8.315300E-01	-2.19139E+01	6.0363E+00	2.1991E+03	6.5179E+00	0.000E+00	1.491E+00
8.358585E-01	-3.05614E+00	5.5206E+01	9.1353E+03	6.5350E+00	0.000E+00	1.483E+00
8.442575E-01	-1.29034E-01	2.4855E+01	8.9186E+03	6.5676E+00	0.000E+00	1.469E+00
8.476515E-01	-4.97044E+00	2.4715E+01	8.8331E+03	6.5806E+00	0.000E+00	1.463E+00
8.483340E-01	-1.12965E+01	2.4688E+01	8.8160E+03	6.5832E+00	0.000E+00	1.462E+00
8.527425E-01	3.63331E+00	3.7187E+01	1.3211E+04	6.5998E+00	0.000E+00	1.454E+00
8.654700E-01	1.27805E+01	3.6387E+01	1.2737E+04	6.6470E+00	0.000E+00	1.433E+00
8.739896E-01	1.61223E+01	3.5868E+01	1.2433E+04	6.6778E+00	0.000E+00	1.419E+00
9.342948E-01	2.75600E+01	3.2536E+01	1.0550E+04	6.8787E+00	0.000E+00	1.327E+00
9.987612E-01	3.28280E+01	2.9646E+01	8.9923E+03	7.0627E+00	0.000E+00	1.241E+00
1.067676E+00	3.55387E+01	2.6971E+01	7.6527E+03	7.2285E+00	0.000E+00	1.161E+00
1.100932E+00	3.56384E+01	2.5830E+01	7.1076E+03	7.2983E+00	0.000E+00	1.126E+00
1.117783E+00	3.43800E+01	2.5284E+01	6.8525E+03	7.3313E+00	0.000E+00	1.109E+00
1.122277E+00	3.23952E+01	2.5142E+01	6.7867E+03	7.3398E+00	0.000E+00	1.105E+00
1.129017E+00	3.47078E+01	2.9075E+01	7.8015E+03	7.3524E+00	0.000E+00	1.098E+00
1.141345E+00	3.65972E+01	2.8607E+01	7.5930E+03	7.3749E+00	0.000E+00	1.086E+00
1.145868E+00	3.70034E+01	2.8438E+01	7.5185E+03	7.3829E+00	0.000E+00	1.082E+00

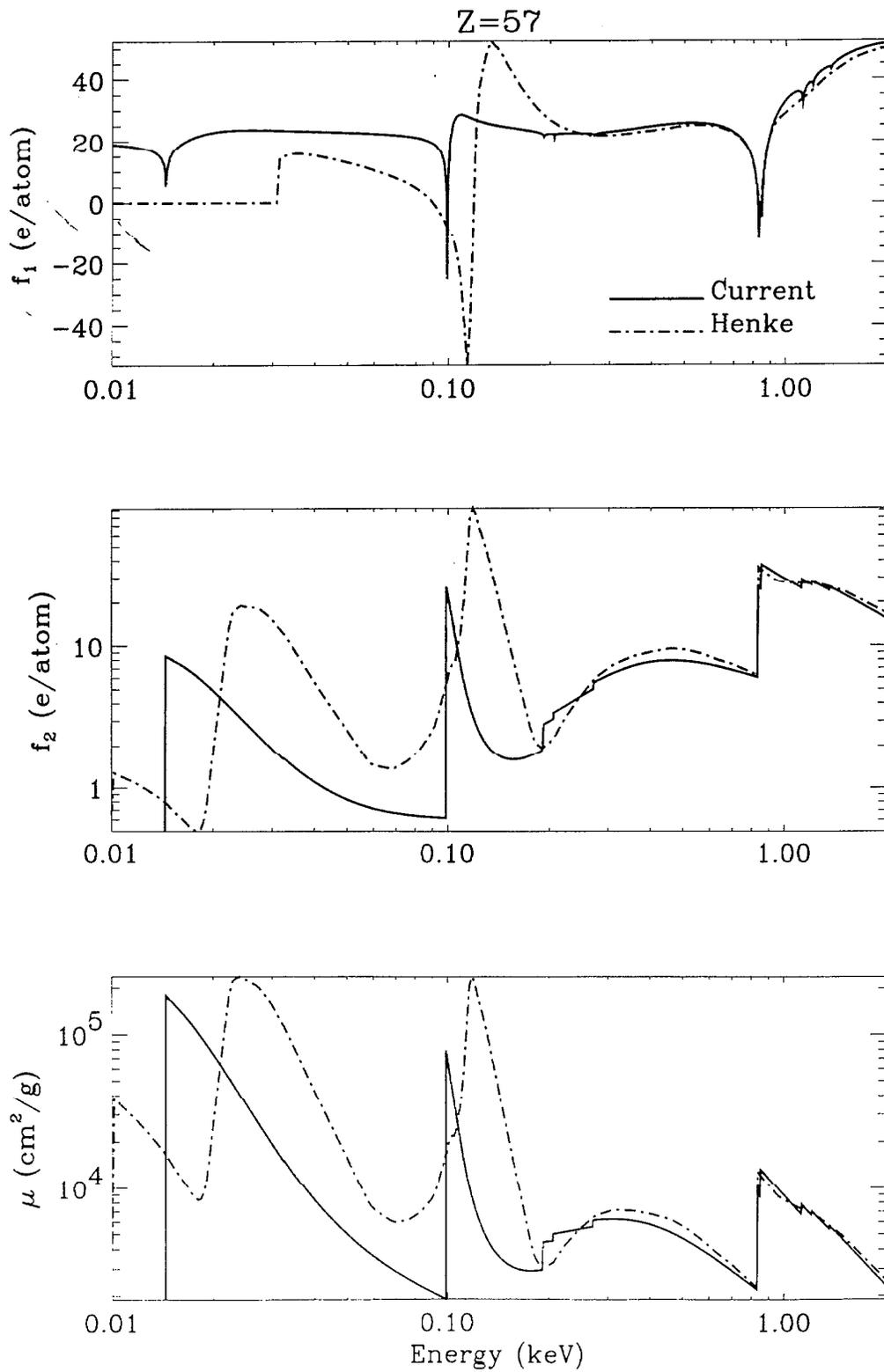
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 409

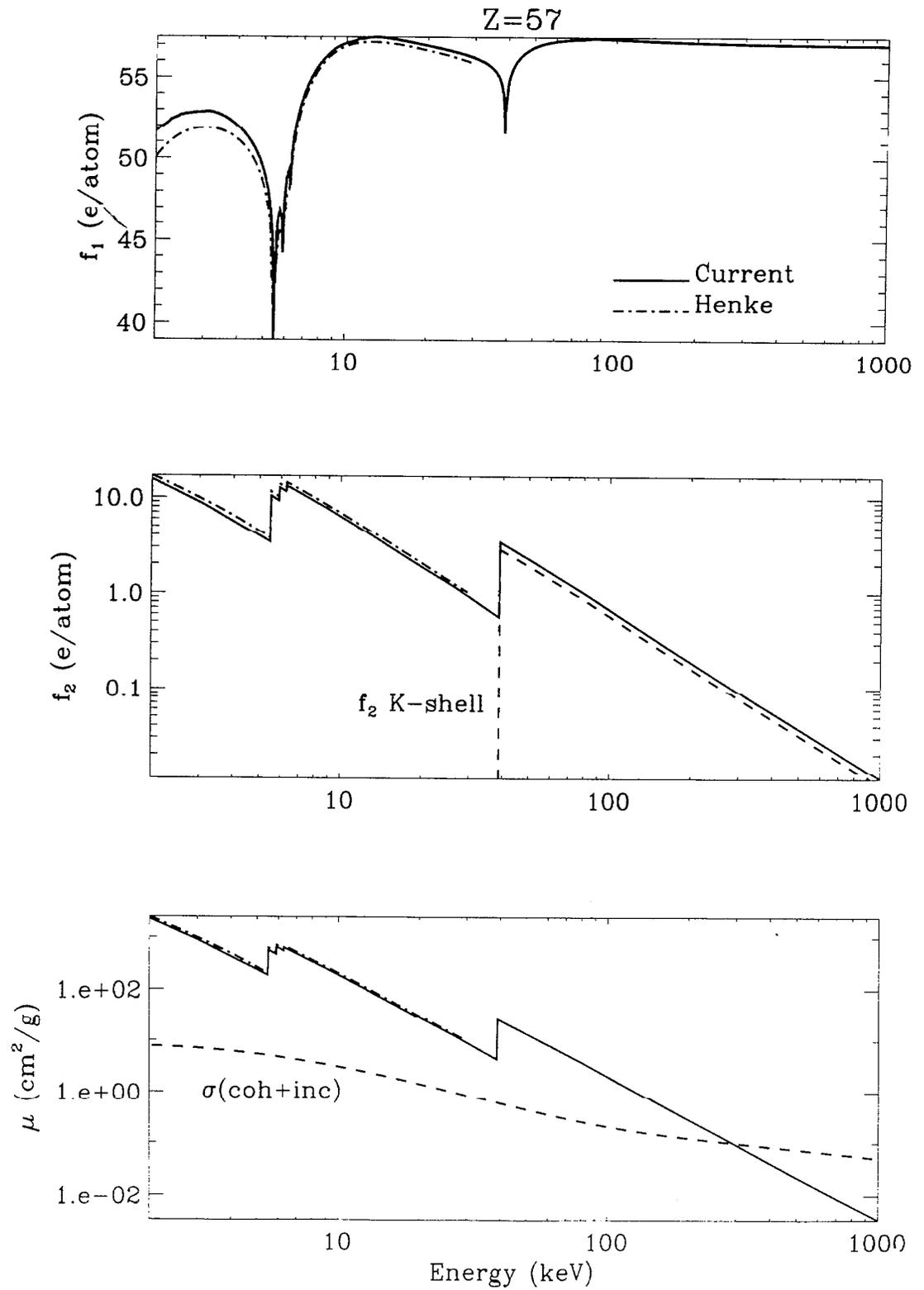
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
1.180312E+00	3.86875E+01	2.7215E+01	6.9851E+03	7.4408E+00	0.000E+00	1.050E+00
1.198378E+00	3.86787E+01	2.6665E+01	6.7407E+03	7.4689E+00	0.000E+00	1.035E+00
1.203196E+00	3.79519E+01	2.6523E+01	6.6780E+03	7.4761E+00	0.000E+00	1.030E+00
1.210422E+00	3.91322E+01	2.8098E+01	7.0323E+03	7.4868E+00	0.000E+00	1.024E+00
1.220098E+00	4.00238E+01	2.7793E+01	6.9008E+03	7.5007E+00	0.000E+00	1.016E+00
1.228488E+00	4.05402E+01	2.7535E+01	6.7900E+03	7.5124E+00	0.000E+00	1.009E+00
1.304285E+00	4.30692E+01	2.5510E+01	5.9252E+03	7.6050E+00	0.000E+00	9.506E-01
1.334074E+00	4.35846E+01	2.4842E+01	5.6411E+03	7.6353E+00	0.000E+00	9.294E-01
1.354493E+00	4.35695E+01	2.4412E+01	5.4599E+03	7.6543E+00	0.000E+00	9.154E-01
1.359939E+00	4.31080E+01	2.4301E+01	5.4133E+03	7.6591E+00	0.000E+00	9.117E-01
1.368106E+00	4.38732E+01	2.5282E+01	5.5983E+03	7.6661E+00	0.000E+00	9.062E-01
1.388526E+00	4.48271E+01	2.4877E+01	5.4276E+03	7.6827E+00	0.000E+00	8.929E-01
1.394281E+00	4.50197E+01	2.4766E+01	5.3811E+03	7.6871E+00	0.000E+00	8.892E-01
1.490486E+00	4.72860E+01	2.2845E+01	4.6432E+03	7.7466E+00	0.000E+00	8.318E-01
1.593329E+00	4.88765E+01	2.0959E+01	3.9849E+03	7.7832E+00	0.000E+00	7.781E-01
1.703269E+00	4.99607E+01	1.9183E+01	3.4118E+03	7.7967E+00	0.000E+00	7.279E-01
1.820795E+00	5.08126E+01	1.7542E+01	2.9186E+03	7.7873E+00	0.000E+00	6.809E-01
1.946430E+00	5.14440E+01	1.6009E+01	2.4916E+03	7.7554E+00	0.000E+00	6.370E-01
2.080733E+00	5.18973E+01	1.4606E+01	2.1266E+03	7.7014E+00	0.000E+00	5.959E-01
2.224304E+00	5.22206E+01	1.3340E+01	1.8169E+03	7.6262E+00	0.000E+00	5.574E-01
2.377781E+00	5.25442E+01	1.2171E+01	1.5506E+03	7.5305E+00	0.000E+00	5.214E-01
2.541848E+00	5.27346E+01	1.1099E+01	1.3228E+03	7.4154E+00	0.000E+00	4.878E-01
2.717235E+00	5.28027E+01	1.0131E+01	1.1295E+03	7.2820E+00	0.000E+00	4.563E-01
2.904724E+00	5.28464E+01	9.2543E+00	9.6516E+02	7.1318E+00	0.000E+00	4.268E-01
3.105150E+00	5.28835E+01	8.3917E+00	8.1870E+02	6.9660E+00	0.000E+00	3.993E-01
3.319406E+00	5.27902E+01	7.5590E+00	6.8986E+02	6.7861E+00	0.000E+00	3.735E-01
3.548445E+00	5.25879E+01	6.7776E+00	5.7863E+02	6.5937E+00	0.000E+00	3.494E-01
3.793288E+00	5.22804E+01	6.0781E+00	4.8542E+02	6.3903E+00	0.000E+00	3.269E-01
4.055024E+00	5.18694E+01	5.4587E+00	4.0781E+02	6.1775E+00	0.000E+00	3.058E-01
4.334821E+00	5.13283E+01	4.9111E+00	3.4322E+02	5.9569E+00	0.000E+00	2.860E-01
4.633924E+00	5.05850E+01	4.4267E+00	2.8939E+02	5.7301E+00	0.000E+00	2.676E-01
4.953664E+00	4.94384E+01	3.9916E+00	2.4411E+02	5.4986E+00	0.000E+00	2.503E-01
5.295467E+00	4.69684E+01	3.5875E+00	2.0523E+02	5.2640E+00	0.000E+00	2.341E-01
5.373046E+00	4.57290E+01	3.5036E+00	1.9754E+02	5.2125E+00	0.000E+00	2.308E-01
5.455286E+00	4.25859E+01	3.4185E+00	1.8983E+02	5.1587E+00	0.000E+00	2.273E-01
5.477217E+00	3.89711E+01	3.3963E+00	1.8785E+02	5.1445E+00	0.000E+00	2.264E-01
5.510113E+00	4.25027E+01	1.0377E+01	5.7051E+02	5.1233E+00	0.000E+00	2.250E-01
5.592354E+00	4.55088E+01	1.0105E+01	5.4739E+02	5.0707E+00	0.000E+00	2.217E-01
5.660855E+00	4.63900E+01	9.8871E+00	5.2911E+02	5.0275E+00	0.000E+00	2.190E-01
5.772788E+00	4.68156E+01	9.5487E+00	5.0109E+02	4.9579E+00	0.000E+00	2.148E-01
5.861147E+00	4.58940E+01	9.3016E+00	4.8077E+02	4.9040E+00	0.000E+00	2.115E-01
5.884710E+00	4.42328E+01	9.2377E+00	4.7555E+02	4.8898E+00	0.000E+00	2.107E-01
5.920053E+00	4.61993E+01	1.2650E+01	6.4732E+02	4.8685E+00	0.000E+00	2.094E-01
6.008412E+00	4.81320E+01	1.2328E+01	6.2157E+02	4.8159E+00	0.000E+00	2.064E-01
6.051453E+00	4.86016E+01	1.2176E+01	6.0955E+02	4.7906E+00	0.000E+00	2.049E-01
6.140974E+00	4.91977E+01	1.1871E+01	5.8559E+02	4.7385E+00	0.000E+00	2.019E-01
6.234969E+00	4.91273E+01	1.1566E+01	5.6197E+02	4.6847E+00	0.000E+00	1.989E-01
6.260034E+00	4.83790E+01	1.1488E+01	5.5593E+02	4.6705E+00	0.000E+00	1.981E-01
6.297632E+00	4.95027E+01	1.3155E+01	6.3282E+02	4.6493E+00	0.000E+00	1.969E-01
6.391626E+00	5.08069E+01	1.2861E+01	6.0959E+02	4.5970E+00	0.000E+00	1.940E-01
6.469004E+00	5.14451E+01	1.2629E+01	5.9140E+02	4.5545E+00	0.000E+00	1.917E-01
6.915365E+00	5.35912E+01	1.1409E+01	4.9982E+02	4.3205E+00	0.000E+00	1.793E-01
7.392525E+00	5.48511E+01	1.0292E+01	4.2176E+02	4.0897E+00	0.000E+00	1.677E-01
7.902609E+00	5.56931E+01	9.2671E+00	3.5525E+02	3.8629E+00	0.000E+00	1.569E-01
8.447890E+00	5.62810E+01	8.3384E+00	2.9902E+02	3.6411E+00	0.000E+00	1.468E-01
9.030794E+00	5.67219E+01	7.4904E+00	2.5127E+02	3.4251E+00	0.000E+00	1.373E-01
9.653919E+00	5.69970E+01	6.6873E+00	2.0985E+02	3.2155E+00	0.000E+00	1.284E-01
1.032004E+01	5.71703E+01	5.9756E+00	1.7541E+02	3.0130E+00	0.000E+00	1.201E-01
1.103212E+01	5.73491E+01	5.3423E+00	1.4670E+02	2.8179E+00	0.000E+00	1.124E-01
1.179334E+01	5.74399E+01	4.7625E+00	1.2234E+02	2.6307E+00	0.000E+00	1.051E-01
1.260708E+01	5.74834E+01	4.2378E+00	1.0183E+02	2.4517E+00	0.000E+00	9.834E-02
1.347697E+01	5.74549E+01	3.7621E+00	8.4567E+01	2.2810E+00	0.000E+00	9.200E-02
1.440688E+01	5.73980E+01	3.3427E+00	7.0288E+01	2.1188E+00	0.000E+00	8.606E-02
1.540095E+01	5.73236E+01	2.9725E+00	5.8469E+01	1.9651E+00	0.000E+00	8.050E-02
1.646362E+01	5.72576E+01	2.6451E+00	4.8671E+01	1.8199E+00	0.000E+00	7.531E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.759961E+01	5.71439E+01	2.3557E+00	4.0549E+01	1.6832E+00	0.000E+00	7.045E-02
1.881398E+01	5.70451E+01	2.0999E+00	3.3812E+01	1.5547E+00	0.000E+00	6.590E-02
2.011215E+01	5.69428E+01	1.8735E+00	2.8221E+01	1.4344E+00	0.000E+00	6.165E-02
2.149988E+01	5.68376E+01	1.6731E+00	2.3575E+01	1.3220E+00	0.000E+00	5.767E-02
2.298338E+01	5.67295E+01	1.4955E+00	1.9712E+01	1.2172E+00	0.000E+00	5.395E-02
2.456923E+01	5.66175E+01	1.3359E+00	1.6472E+01	1.1198E+00	0.000E+00	5.046E-02
2.626450E+01	5.64980E+01	1.1917E+00	1.3745E+01	1.0295E+00	0.000E+00	4.721E-02
2.807676E+01	5.63624E+01	1.0525E+00	1.1356E+01	9.4590E-01	0.000E+00	4.416E-02
3.001405E+01	5.61951E+01	9.2569E-01	9.3433E+00	8.6874E-01	0.000E+00	4.131E-02
3.208502E+01	5.59805E+01	8.1452E-01	7.6906E+00	7.9767E-01	0.000E+00	3.864E-02
3.429889E+01	5.56735E+01	7.1730E-01	6.3355E+00	7.3234E-01	0.000E+00	3.615E-02
3.666551E+01	5.51093E+01	6.3221E-01	5.2235E+00	6.7241E-01	0.000E+00	3.381E-02
3.814611E+01	5.42292E+01	5.8681E-01	4.6602E+00	6.3926E-01	0.000E+00	3.250E-02
3.872998E+01	5.30188E+01	5.7031E-01	4.4609E+00	6.2700E-01	0.000E+00	3.201E-02
3.888567E+01	5.15674E+01	5.6603E-01	4.4097E+00	6.2380E-01	0.000E+00	3.188E-02
3.911922E+01	5.30359E+01	3.4178E+00	2.6467E+01	6.1906E-01	2.213E+01	3.169E-02
3.919543E+01	5.33483E+01	3.4071E+00	2.6334E+01	6.1753E-01	2.202E+01	3.163E-02
3.970309E+01	5.43636E+01	3.3377E+00	2.5467E+01	6.0750E-01	2.131E+01	3.123E-02
4.189992E+01	5.56912E+01	3.0600E+00	2.2124E+01	5.6738E-01	1.856E+01	2.959E-02
4.479101E+01	5.63415E+01	2.7431E+00	1.8553E+01	5.2163E-01	1.561E+01	2.768E-02
4.788159E+01	5.67055E+01	2.4574E+00	1.5548E+01	4.7996E-01	1.311E+01	2.589E-02
5.118542E+01	5.69403E+01	2.1998E+00	1.3019E+01	4.4206E-01	1.100E+01	2.422E-02
5.471721E+01	5.70962E+01	1.9636E+00	1.0871E+01	4.0765E-01	9.202E+00	2.266E-02
5.849270E+01	5.72003E+01	1.7523E+00	9.0752E+00	3.7644E-01	7.692E+00	2.120E-02
6.252870E+01	5.72696E+01	1.5634E+00	7.5744E+00	3.4817E-01	6.426E+00	1.983E-02
6.684318E+01	5.73146E+01	1.3947E+00	6.3207E+00	3.2258E-01	5.368E+00	1.855E-02
7.145536E+01	5.73424E+01	1.2440E+00	5.2741E+00	2.9945E-01	4.482E+00	1.735E-02
7.638578E+01	5.73584E+01	1.1096E+00	4.4005E+00	2.7854E-01	3.742E+00	1.623E-02
8.165640E+01	5.73969E+01	9.8626E-01	3.6590E+00	2.5965E-01	3.113E+00	1.518E-02
8.729069E+01	5.73925E+01	8.7300E-01	3.0298E+00	2.4260E-01	2.579E+00	1.420E-02
9.331374E+01	5.73815E+01	7.7283E-01	2.5090E+00	2.2720E-01	2.1329E+00	1.329E-02
9.975239E+01	5.73663E+01	6.8421E-01	2.0779E+00	2.1328E-01	1.771E+00	1.243E-02
1.066353E+02	5.73485E+01	6.0580E-01	1.7210E+00	2.0070E-01	1.468E+00	1.163E-02
1.139931E+02	5.73291E+01	5.3642E-01	1.4256E+00	1.8931E-01	1.216E+00	1.088E-02
1.218587E+02	5.73090E+01	4.7503E-01	1.1809E+00	1.7899E-01	1.008E+00	1.017E-02
1.302669E+02	5.72887E+01	4.2070E-01	9.7836E-01	1.6963E-01	8.352E-01	9.518E-03
1.392553E+02	5.72686E+01	3.7261E-01	8.1059E-01	1.6111E-01	6.921E-01	8.903E-03
1.488640E+02	5.72490E+01	3.3004E-01	6.7164E-01	1.5334E-01	5.735E-01	8.329E-03
1.591356E+02	5.72300E+01	2.9236E-01	5.5655E-01	1.4624E-01	4.753E-01	7.791E-03
1.701159E+02	5.72119E+01	2.5904E-01	4.6129E-01	1.3973E-01	3.939E-01	7.288E-03
1.818539E+02	5.71948E+01	2.2981E-01	3.8282E-01	1.3374E-01	3.269E-01	6.818E-03
1.944018E+02	5.71787E+01	2.0389E-01	3.1772E-01	1.2820E-01	2.714E-01	6.378E-03
2.078156E+02	5.71638E+01	1.8090E-01	2.6371E-01	1.2307E-01	2.252E-01	5.966E-03
2.221548E+02	5.71498E+01	1.6052E-01	2.1889E-01	1.1828E-01	1.869E-01	5.581E-03
2.374835E+02	5.71369E+01	1.4244E-01	1.8170E-01	1.1381E-01	1.552E-01	5.221E-03
2.538699E+02	5.71249E+01	1.2641E-01	1.5084E-01	1.0961E-01	1.288E-01	4.884E-03
2.713869E+02	5.71138E+01	1.1218E-01	1.2523E-01	1.0564E-01	1.069E-01	4.569E-03
2.901126E+02	5.71036E+01	9.9565E-02	1.0397E-01	1.0188E-01	8.871E-02	4.274E-03
3.101304E+02	5.70942E+01	8.8371E-02	8.6323E-02	9.8302E-02	7.363E-02	3.998E-03
3.315294E+02	5.70856E+01	7.8440E-02	7.1676E-02	9.4884E-02	6.111E-02	3.740E-03
3.544049E+02	5.70777E+01	6.9628E-02	5.9518E-02	9.1606E-02	5.072E-02	3.498E-03
3.788588E+02	5.70705E+01	6.1809E-02	4.9424E-02	8.8452E-02	4.210E-02	3.273E-03
4.050001E+02	5.70639E+01	5.4871E-02	4.1044E-02	8.5408E-02	3.494E-02	3.061E-03
4.329451E+02	5.70578E+01	4.8714E-02	3.4086E-02	8.2462E-02	2.900E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 413

Ce Z = 58

$\mu_{\text{atomic weight}} = 1.401200\text{E}+02$ g/mol, nominal density ρ (g/cm³) = 6.6370E+00

$\mu_{\text{barns/atom}} = \mu(\text{cm}^2/\text{g}) \times 2.32675\text{E}+02$, $E(\text{eV}) \mu(\text{cm}^2/\text{g}) = f_2(\text{e/atom}) \times 3.00316\text{E}+05$

λ edges. Edge energies (keV):

K		4.04430E+00	L	I	6.54880E+00	L	II	6.16420E+00	L	III	5.72340E+00
M	I	1.43460E+00	M	II	1.27280E+00	M	III	1.18540E+00	M	IV	9.01300E-01
N	V	8.83300E-00	N	I	2.89600E-00	N	II	2.23300E-00	N	III	2.07200E-01
O	IV	1.10000E-00	O	V	1.10000E-00	O	I	8.59000E-02	O	II	3.78000E-02
P	III	1.98000E-02	P	VI	1.98000E-02						

Relativistic correction estimate $f_{\text{rel}}(\text{H82,3/5CL}) = -7.7379\text{E}-01$, $-4.7160\text{E}-01$ e/atom

Nuclear Thomson correction $f_{\text{NT}} = -1.3170\text{E}-02$ e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{K} cm ² /g	λ nm
1.069000E-02	1.85477E+01	0.0000E+00	0.0000E+00	1.5991E-04	0.000E+00	1.160E+02
1.142761E-02	1.84321E+01	0.0000E+00	0.0000E+00	2.1848E-04	0.000E+00	1.085E+02
1.221612E-02	1.82878E+01	0.0000E+00	0.0000E+00	2.9695E-04	0.000E+00	1.015E+02
1.305903E-02	1.81041E+01	0.0000E+00	0.0000E+00	4.0149E-04	0.000E+00	9.494E+01
1.396010E-02	1.78640E+01	0.0000E+00	0.0000E+00	5.4001E-04	0.000E+00	8.881E+01
1.492335E-02	1.75380E+01	0.0000E+00	0.0000E+00	7.2256E-04	0.000E+00	8.308E+01
1.595306E-02	1.70701E+01	0.0000E+00	0.0000E+00	9.6187E-04	0.000E+00	7.772E+01
1.705382E-02	1.63339E+01	0.0000E+00	0.0000E+00	1.2739E-03	0.000E+00	7.270E+01
1.823053E-02	1.49461E+01	0.0000E+00	0.0000E+00	1.6785E-03	0.000E+00	6.801E+01
1.940400E-02	1.08521E+01	0.0000E+00	0.0000E+00	2.1624E-03	0.000E+00	6.390E+01
1.948844E-02	1.00681E+01	0.0000E+00	0.0000E+00	2.2005E-03	0.000E+00	6.362E+01
1.970100E-02	6.14720E+00	0.0000E+00	0.0000E+00	2.2985E-03	0.000E+00	6.293E+01
1.978020E-02	3.79223E-01	0.0000E+00	0.0000E+00	2.3357E-03	0.000E+00	6.268E+01
1.989900E-02	6.55466E+00	1.1424E+01	1.7242E+05	2.3923E-03	0.000E+00	6.231E+01
2.019600E-02	1.20134E+01	1.1037E+01	1.6413E+05	2.5379E-03	0.000E+00	6.139E+01
2.083314E-02	1.59795E+01	1.0269E+01	1.4803E+05	2.8704E-03	0.000E+00	5.951E+01
2.227063E-02	1.96057E+01	8.7851E+00	1.1847E+05	3.7254E-03	0.000E+00	5.567E+01
2.380730E-02	2.14408E+01	7.3863E+00	9.3174E+04	4.8110E-03	0.000E+00	5.208E+01
2.545001E-02	2.24561E+01	6.1056E+00	7.2048E+04	6.1825E-03	0.000E+00	4.872E+01
2.720606E-02	2.29871E+01	4.9917E+00	5.5102E+04	7.9058E-03	0.000E+00	4.557E+01
2.908327E-02	2.32158E+01	4.0571E+00	4.1894E+04	1.0060E-02	0.000E+00	4.263E+01
3.109002E-02	2.32563E+01	3.2921E+00	3.1801E+04	1.2740E-02	0.000E+00	3.988E+01
3.323523E-02	2.31818E+01	2.6767E+00	2.4187E+04	1.6055E-02	0.000E+00	3.731E+01
3.552846E-02	2.30382E+01	2.1871E+00	1.8487E+04	2.0137E-02	0.000E+00	3.490E+01
3.704400E-02	2.29227E+01	1.9341E+00	1.5680E+04	2.3148E-02	0.000E+00	3.347E+01
3.761100E-02	2.28708E+01	1.8511E+00	1.4781E+04	2.4340E-02	0.000E+00	3.296E+01
3.776220E-02	2.28481E+01	1.8299E+00	1.4553E+04	2.4664E-02	0.000E+00	3.283E+01
3.797993E-02	2.28421E+01	1.8223E+00	1.4409E+04	2.5135E-02	0.000E+00	3.264E+01
3.798900E-02	2.28418E+01	1.8211E+00	1.4396E+04	2.5155E-02	0.000E+00	3.264E+01
3.855600E-02	2.28084E+01	1.7485E+00	1.3619E+04	2.6408E-02	0.000E+00	3.216E+01
4.060054E-02	2.25640E+01	1.5247E+00	1.1278E+04	3.1227E-02	0.000E+00	3.054E+01
4.340198E-02	2.24654E+01	1.2941E+00	8.9543E+03	3.8613E-02	0.000E+00	2.857E+01
4.639673E-02	2.22623E+01	1.1157E+00	7.2215E+03	4.7323E-02	0.000E+00	2.672E+01
4.959809E-02	2.20558E+01	9.7795E-01	5.9215E+03	5.8219E-02	0.000E+00	2.500E+01
5.302035E-02	2.18440E+01	8.7190E-01	4.9386E+03	7.0994E-02	0.000E+00	2.338E+01
5.667876E-02	2.16221E+01	7.9042E-01	4.1881E+03	8.6176E-02	0.000E+00	2.187E+01
6.058959E-02	2.13955E+01	7.2792E-01	3.6080E+03	1.0413E-01	0.000E+00	2.046E+01
6.477028E-02	2.11284E+01	6.8006E-01	3.1532E+03	1.2526E-01	0.000E+00	1.914E+01
6.923942E-02	2.08174E+01	6.4347E-01	2.7910E+03	1.5000E-01	0.000E+00	1.791E+01
7.401695E-02	2.04375E+01	6.1552E-01	2.4974E+03	1.7882E-01	0.000E+00	1.675E+01
7.912411E-02	1.99452E+01	5.9418E-01	2.2552E+03	2.1225E-01	0.000E+00	1.567E+01
8.418200E-02	1.93008E+01	5.7914E-01	2.0661E+03	2.4789E-01	0.000E+00	1.473E+01
8.458368E-02	1.92365E+01	5.7815E-01	2.0528E+03	2.5082E-01	0.000E+00	1.466E+01
8.547050E-02	1.90720E+01	5.7606E-01	2.0241E+03	2.5735E-01	0.000E+00	1.451E+01
8.581410E-02	1.89691E+01	5.7528E-01	2.0133E+03	2.5990E-01	0.000E+00	1.445E+01
8.632950E-02	1.89340E+01	6.7415E-01	2.3452E+03	2.6375E-01	0.000E+00	1.436E+01
8.761800E-02	1.87633E+01	6.8664E-01	2.3535E+03	2.7347E-01	0.000E+00	1.415E+01
9.041995E-02	1.82758E+01	7.2185E-01	2.3975E+03	2.9511E-01	0.000E+00	1.371E+01
9.665893E-02	1.66918E+01	8.4947E-01	2.6393E+03	3.4572E-01	0.000E+00	1.283E+01
1.033284E-01	1.31370E+01	1.0495E+00	3.0502E+03	4.0328E-01	0.000E+00	1.200E+01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.078000E-01	5.12263E+00	1.2092E+00	3.3687E+03	4.4371E-01	0.000E+00	1.150E+01
1.094500E-01	-8.64721E+00	1.2718E+00	3.4895E+03	4.5899E-01	0.000E+00	1.133E+01
1.098900E-01	-2.79860E+01	1.2887E+00	3.5218E+03	4.6309E-01	0.000E+00	1.128E+01
1.104581E-01	-5.31339E+00	4.0959E+01	1.1136E+05	4.6841E-01	0.000E+00	1.122E+01
1.105500E-01	-2.53344E+00	4.0450E+01	1.0988E+05	4.6927E-01	0.000E+00	1.122E+01
1.122000E-01	1.84513E+01	3.2422E+01	8.6781E+04	4.8485E-01	0.000E+00	1.105E+01
1.180797E-01	3.03692E+01	1.3580E+01	3.9626E+04	5.4176E-01	0.000E+00	1.050E+01
1.262272E-01	2.91226E+01	7.1616E+00	1.7039E+04	6.2396E-01	0.000E+00	9.822E+00
1.349368E-01	2.69869E+01	4.7904E+00	1.0662E+04	7.1565E-01	0.000E+00	9.188E+00
1.442475E-01	2.57041E+01	4.0662E+00	8.4657E+03	8.1742E-01	0.000E+00	8.595E+00
1.542005E-01	2.49525E+01	3.8505E+00	7.4991E+03	9.2983E-01	0.000E+00	8.040E+00
1.648404E-01	2.44842E+01	3.8044E+00	6.9311E+03	1.0534E+00	0.000E+00	7.521E+00
1.762144E-01	2.41452E+01	3.8146E+00	6.5011E+03	1.1885E+00	0.000E+00	7.036E+00
1.883732E-01	2.38195E+01	3.8450E+00	6.1299E+03	1.3357E+00	0.000E+00	6.582E+00
2.013709E-01	2.32986E+01	3.8897E+00	5.8009E+03	1.4950E+00	0.000E+00	6.157E+00
2.030560E-01	2.31721E+01	3.8965E+00	5.7629E+03	1.5158E+00	0.000E+00	6.106E+00
2.061640E-01	2.27074E+01	3.9099E+00	5.6955E+03	1.5542E+00	0.000E+00	6.014E+00
2.069928E-01	2.22092E+01	3.9136E+00	5.6781E+03	1.5644E+00	0.000E+00	5.990E+00
2.082360E-01	2.26691E+01	4.8664E+00	7.0183E+03	1.5798E+00	0.000E+00	5.954E+00
2.113440E-01	2.30311E+01	4.8930E+00	6.9529E+03	1.6182E+00	0.000E+00	5.866E+00
2.152655E-01	2.31562E+01	4.9281E+00	6.8752E+03	1.6668E+00	0.000E+00	5.760E+00
2.188340E-01	2.31771E+01	4.9616E+00	6.8090E+03	1.7111E+00	0.000E+00	5.666E+00
2.221835E-01	2.30847E+01	4.9944E+00	6.7508E+03	1.7526E+00	0.000E+00	5.580E+00
2.230767E-01	2.29305E+01	5.0034E+00	6.7358E+03	1.7637E+00	0.000E+00	5.558E+00
2.244165E-01	2.31075E+01	5.3388E+00	7.1444E+03	1.7803E+00	0.000E+00	5.525E+00
2.277660E-01	2.32773E+01	5.3784E+00	7.0916E+03	1.8219E+00	0.000E+00	5.443E+00
2.301188E-01	2.33369E+01	5.4070E+00	7.0564E+03	1.8511E+00	0.000E+00	5.388E+00
2.459970E-01	2.35260E+01	5.6147E+00	6.8545E+03	2.0477E+00	0.000E+00	5.040E+00
2.629708E-01	2.36066E+01	5.8612E+00	6.6935E+03	2.2565E+00	0.000E+00	4.715E+00
2.811158E-01	2.35791E+01	6.1427E+00	6.5622E+03	2.4770E+00	0.000E+00	4.410E+00
2.838080E-01	2.35410E+01	6.1853E+00	6.5450E+03	2.5095E+00	0.000E+00	4.369E+00
2.881520E-01	2.33542E+01	6.2541E+00	6.5181E+03	2.5616E+00	0.000E+00	4.303E+00
2.893104E-01	2.31025E+01	6.2724E+00	6.5111E+03	2.5755E+00	0.000E+00	4.286E+00
2.910480E-01	2.33794E+01	6.8120E+00	7.0290E+03	2.5963E+00	0.000E+00	4.260E+00
2.953920E-01	2.36458E+01	6.8843E+00	6.9990E+03	2.6481E+00	0.000E+00	4.197E+00
3.005128E-01	2.38000E+01	6.9690E+00	6.9644E+03	2.7088E+00	0.000E+00	4.126E+00
3.212482E-01	2.42058E+01	7.3018E+00	6.8261E+03	2.9512E+00	0.000E+00	3.859E+00
3.434143E-01	2.45712E+01	7.6240E+00	6.6672E+03	3.2033E+00	0.000E+00	3.610E+00
3.671099E-01	2.49630E+01	7.9138E+00	6.4739E+03	3.4641E+00	0.000E+00	3.377E+00
3.924405E-01	2.53727E+01	8.1521E+00	6.2384E+03	3.7323E+00	0.000E+00	3.159E+00
4.195189E-01	2.57854E+01	8.3262E+00	5.9604E+03	4.0068E+00	0.000E+00	2.955E+00
4.484657E-01	2.61800E+01	8.4268E+00	5.6431E+03	4.2859E+00	0.000E+00	2.765E+00
4.794098E-01	2.65263E+01	8.4410E+00	5.2877E+03	4.5680E+00	0.000E+00	2.586E+00
5.124891E-01	2.67830E+01	8.3709E+00	4.9053E+03	4.8516E+00	0.000E+00	2.419E+00
5.478508E-01	2.69084E+01	8.2281E+00	4.5104E+03	5.1346E+00	0.000E+00	2.263E+00
5.856525E-01	2.68554E+01	8.0259E+00	4.1156E+03	5.4153E+00	0.000E+00	2.117E+00
6.260625E-01	2.65618E+01	7.7785E+00	3.7313E+03	5.6916E+00	0.000E+00	1.980E+00
6.692609E-01	2.59329E+01	7.4990E+00	3.3650E+03	5.9616E+00	0.000E+00	1.853E+00
7.154399E-01	2.47956E+01	7.1990E+00	3.0219E+03	6.2233E+00	0.000E+00	1.733E+00
7.648052E-01	2.27724E+01	6.8875E+00	2.7045E+03	6.4748E+00	0.000E+00	1.621E+00
8.175768E-01	1.87435E+01	6.5726E+00	2.4143E+03	6.7140E+00	0.000E+00	1.516E+00
8.656340E-01	8.85327E+00	6.3043E+00	2.1872E+03	6.9077E+00	0.000E+00	1.432E+00
8.739896E-01	4.11953E+00	6.2595E+00	2.1509E+03	6.9392E+00	0.000E+00	1.419E+00
8.788835E-01	-1.15258E+00	6.2335E+00	2.1300E+03	6.9573E+00	0.000E+00	1.411E+00
8.832740E-01	-3.45756E+01	6.2104E+00	2.1115E+03	6.9734E+00	0.000E+00	1.404E+00
8.877165E-01	-2.48566E+00	2.6121E+01	8.8367E+03	6.9895E+00	0.000E+00	1.397E+00
8.967935E-01	6.34175E-01	2.5699E+01	8.6060E+03	7.0220E+00	0.000E+00	1.383E+00
9.003987E-01	-4.41287E+00	2.5534E+01	8.5167E+03	7.0346E+00	0.000E+00	1.377E+00
9.009660E-01	-8.36830E+00	2.5509E+01	8.5027E+03	7.0366E+00	0.000E+00	1.376E+00
9.058065E-01	4.57327E+00	3.8494E+01	1.2763E+04	7.0534E+00	0.000E+00	1.369E+00
9.193260E-01	1.41198E+01	3.7541E+01	1.2263E+04	7.0994E+00	0.000E+00	1.349E+00
9.342948E-01	1.94031E+01	3.6529E+01	1.1742E+04	7.1485E+00	0.000E+00	1.327E+00
9.987612E-01	2.99944E+01	3.2667E+01	9.8227E+03	7.3405E+00	0.000E+00	1.241E+00
1.067676E+00	3.48425E+01	2.9443E+01	8.2818E+03	7.5135E+00	0.000E+00	1.161E+00
1.141345E+00	3.69803E+01	2.6661E+01	7.0151E+03	7.6663E+00	0.000E+00	1.086E+00

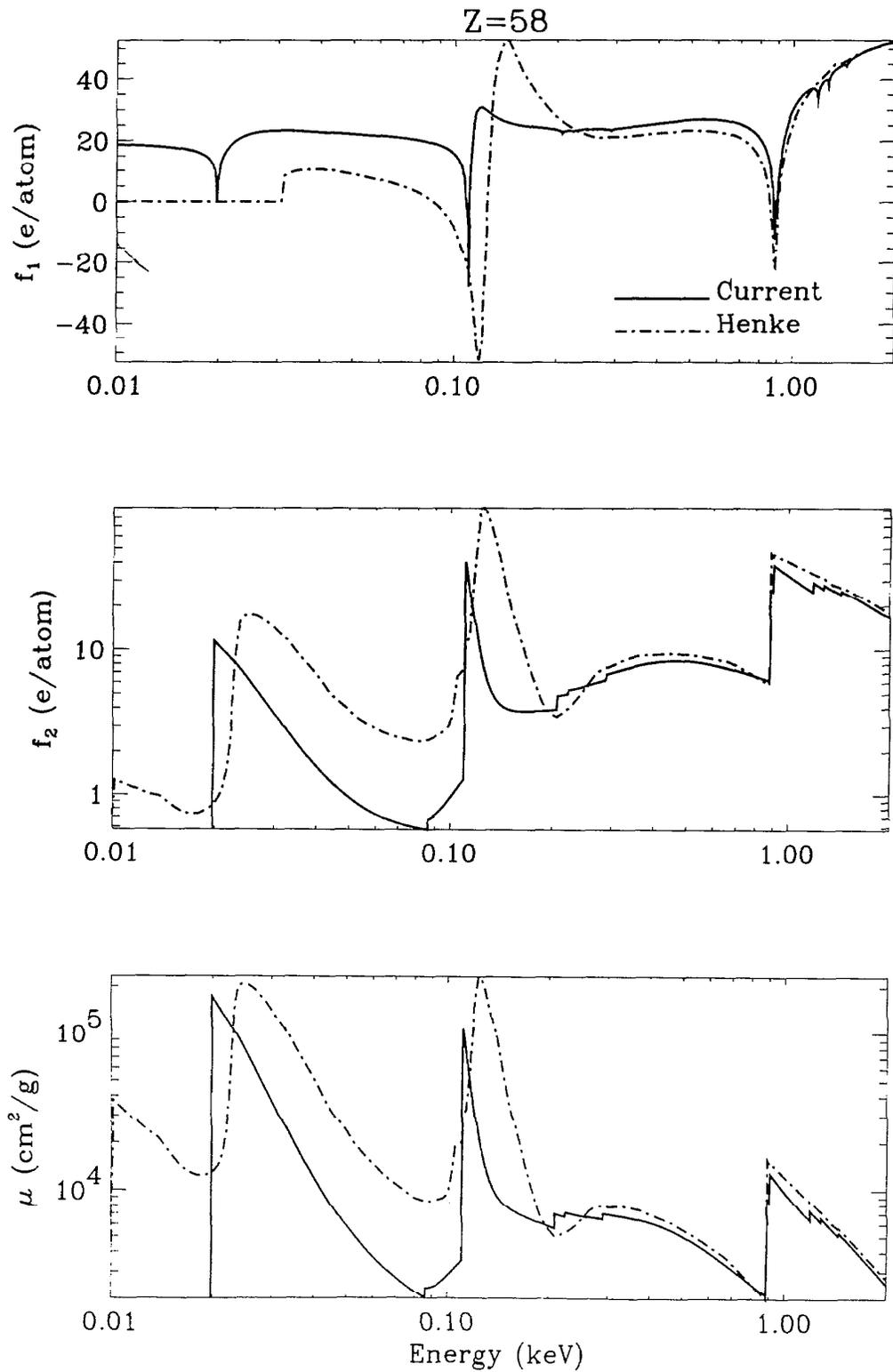
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 415

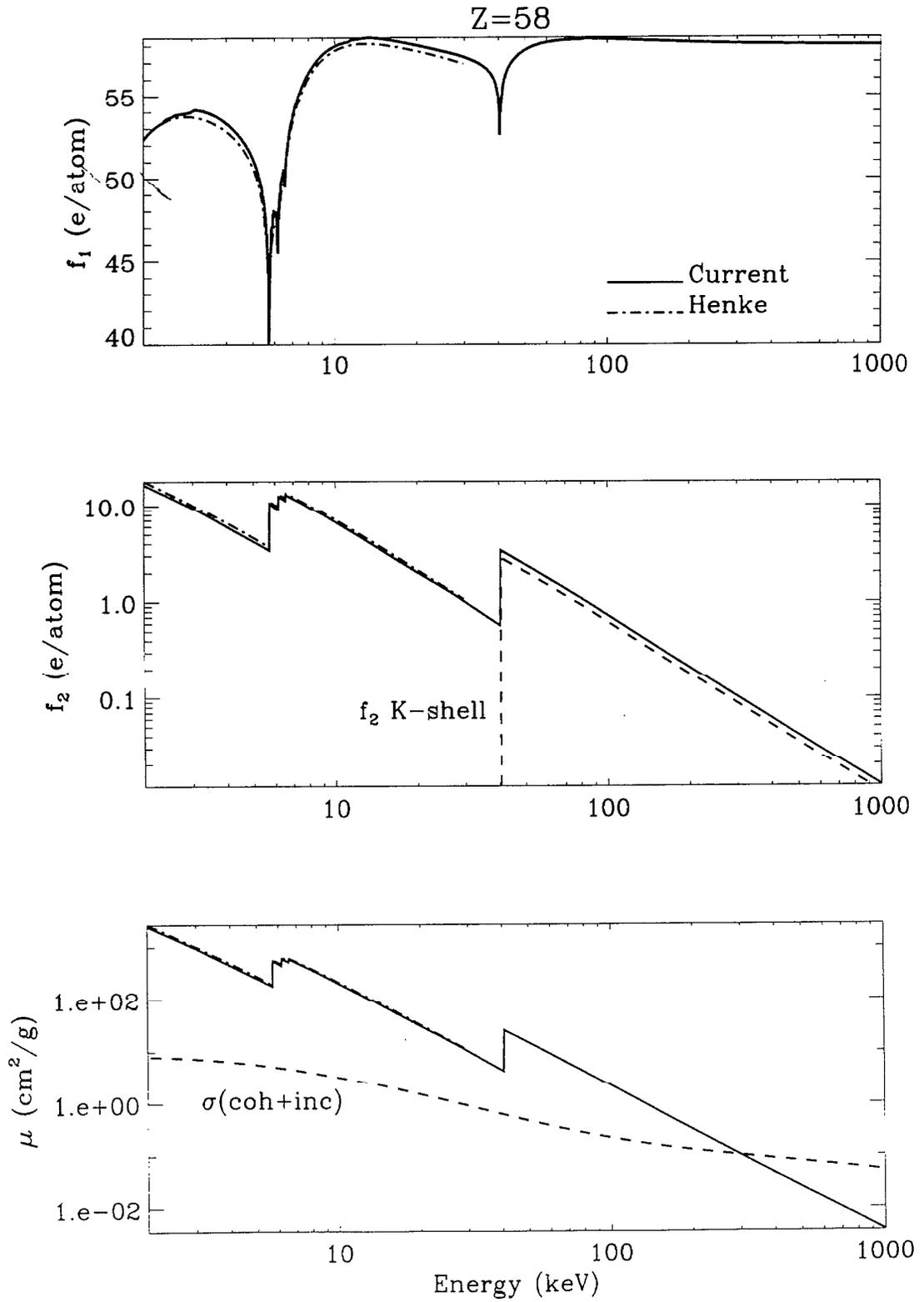
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.161692E+00	3.68591E+01	2.5984E+01	6.7173E+03	7.7033E+00	0.000E+00	1.067E+00
1.179473E+00	3.55587E+01	2.5419E+01	6.4721E+03	7.7338E+00	0.000E+00	1.051E+00
1.184215E+00	3.35310E+01	2.5272E+01	6.4090E+03	7.7417E+00	0.000E+00	1.047E+00
1.191327E+00	3.58829E+01	2.9279E+01	7.3808E+03	7.7533E+00	0.000E+00	1.041E+00
1.209108E+00	3.82100E+01	2.8619E+01	7.1085E+03	7.7812E+00	0.000E+00	1.025E+00
1.220098E+00	3.89332E+01	2.8225E+01	6.9474E+03	7.7978E+00	0.000E+00	1.016E+00
1.247344E+00	3.99517E+01	2.7301E+01	6.5732E+03	7.8364E+00	0.000E+00	9.940E-01
1.266436E+00	3.99120E+01	2.6742E+01	6.3414E+03	7.8615E+00	0.000E+00	9.790E-01
1.271527E+00	3.91626E+01	2.6598E+01	6.2821E+03	7.8680E+00	0.000E+00	9.751E-01
1.279164E+00	4.03586E+01	2.8207E+01	6.6222E+03	7.8774E+00	0.000E+00	9.693E-01
1.298256E+00	4.17722E+01	2.7629E+01	6.3913E+03	7.9000E+00	0.000E+00	9.550E-01
1.304285E+00	4.20651E+01	2.7453E+01	6.3212E+03	7.9069E+00	0.000E+00	9.506E-01
1.394281E+00	4.43314E+01	2.5227E+01	5.4337E+03	7.9930E+00	0.000E+00	8.892E-01
1.405908E+00	4.46848E+01	2.4983E+01	5.3366E+03	8.0020E+00	0.000E+00	8.819E-01
1.427427E+00	4.46619E+01	2.4549E+01	5.1648E+03	8.0177E+00	0.000E+00	8.686E-01
1.433165E+00	4.41922E+01	2.4437E+01	5.1207E+03	8.0210E+00	0.000E+00	8.651E-01
1.441773E+00	4.49648E+01	2.5432E+01	5.2973E+03	8.0273E+00	0.000E+00	8.599E-01
1.463292E+00	4.59230E+01	2.5020E+01	5.1350E+03	8.0406E+00	0.000E+00	8.473E-01
1.490486E+00	4.67032E+01	2.4525E+01	4.9415E+03	8.0555E+00	0.000E+00	8.318E-01
1.593329E+00	4.87721E+01	2.2579E+01	4.2558E+03	8.0941E+00	0.000E+00	7.781E-01
1.703269E+00	5.02271E+01	2.0699E+01	3.6496E+03	8.1088E+00	0.000E+00	7.279E-01
1.820795E+00	5.12984E+01	1.8933E+01	3.1228E+03	8.0996E+00	0.000E+00	6.809E-01
1.946430E+00	5.21013E+01	1.7300E+01	2.6692E+03	8.0670E+00	0.000E+00	6.370E-01
2.080733E+00	5.26929E+01	1.5796E+01	2.2799E+03	8.0114E+00	0.000E+00	5.959E-01
2.224304E+00	5.31185E+01	1.4404E+01	1.9447E+03	7.9336E+00	0.000E+00	5.574E-01
2.377781E+00	5.35173E+01	1.3148E+01	1.6606E+03	7.8346E+00	0.000E+00	5.214E-01
2.541848E+00	5.37256E+01	1.1988E+01	1.4164E+03	7.7153E+00	0.000E+00	4.878E-01
2.717235E+00	5.38825E+01	1.0931E+01	1.2081E+03	7.5770E+00	0.000E+00	4.563E-01
2.904724E+00	5.39726E+01	9.9786E+00	1.0317E+03	7.4211E+00	0.000E+00	4.268E-01
3.105150E+00	5.41316E+01	9.0399E+00	8.7430E+02	7.2490E+00	0.000E+00	3.993E-01
3.319406E+00	5.40412E+01	8.1349E+00	7.3599E+02	7.0622E+00	0.000E+00	3.735E-01
3.548445E+00	5.38652E+01	7.3286E+00	6.2024E+02	6.8623E+00	0.000E+00	3.494E-01
3.793288E+00	5.36071E+01	6.5717E+00	5.2029E+02	6.6510E+00	0.000E+00	3.269E-01
4.055024E+00	5.32539E+01	5.8978E+00	4.3679E+02	6.4298E+00	0.000E+00	3.058E-01
4.334821E+00	5.27952E+01	5.3002E+00	3.6720E+02	6.2005E+00	0.000E+00	2.860E-01
4.633924E+00	5.21906E+01	4.7711E+00	3.0921E+02	5.9647E+00	0.000E+00	2.676E-01
4.953664E+00	5.13382E+01	4.3029E+00	2.6086E+02	5.7239E+00	0.000E+00	2.503E-01
5.295467E+00	4.99245E+01	3.8778E+00	2.1992E+02	5.4798E+00	0.000E+00	2.341E-01
5.608932E+00	4.68297E+01	3.5375E+00	1.8941E+02	5.2678E+00	0.000E+00	2.210E-01
5.660855E+00	4.54426E+01	3.4850E+00	1.8488E+02	5.2338E+00	0.000E+00	2.190E-01
5.694783E+00	4.36597E+01	3.4514E+00	1.8201E+02	5.2117E+00	0.000E+00	2.177E-01
5.717677E+00	3.99880E+01	3.4291E+00	1.8011E+02	5.1969E+00	0.000E+00	2.168E-01
5.752017E+00	4.36201E+01	1.0533E+01	5.4996E+02	5.1748E+00	0.000E+00	2.155E-01
5.837868E+00	4.67211E+01	1.0205E+01	5.2496E+02	5.1200E+00	0.000E+00	2.124E-01
6.040916E+00	4.81015E+01	9.5007E+00	4.7231E+02	4.9937E+00	0.000E+00	2.052E-01
6.051453E+00	4.80772E+01	9.4699E+00	4.6996E+02	4.9873E+00	0.000E+00	2.049E-01
6.133379E+00	4.71455E+01	9.2384E+00	4.5235E+02	4.9377E+00	0.000E+00	2.021E-01
6.158036E+00	4.54890E+01	9.1714E+00	4.4727E+02	4.9229E+00	0.000E+00	2.013E-01
6.195021E+00	4.74235E+01	1.2550E+01	6.0840E+02	4.9008E+00	0.000E+00	2.001E-01
6.287484E+00	4.93080E+01	1.2227E+01	5.8400E+02	4.8463E+00	0.000E+00	1.972E-01
6.417824E+00	5.02841E+01	1.1799E+01	5.5212E+02	4.7708E+00	0.000E+00	1.932E-01
6.469004E+00	5.03955E+01	1.1639E+01	5.4034E+02	4.7417E+00	0.000E+00	1.917E-01
6.516056E+00	5.02108E+01	1.1497E+01	5.2990E+02	4.7151E+00	0.000E+00	1.903E-01
6.542251E+00	4.94645E+01	1.1420E+01	5.2422E+02	4.7004E+00	0.000E+00	1.895E-01
6.581544E+00	5.05806E+01	1.3081E+01	5.9687E+02	4.6785E+00	0.000E+00	1.884E-01
6.679776E+00	5.18733E+01	1.2792E+01	5.7513E+02	4.6243E+00	0.000E+00	1.856E-01
6.915365E+00	5.33992E+01	1.2149E+01	5.2760E+02	4.4981E+00	0.000E+00	1.793E-01
7.392525E+00	5.51261E+01	1.0991E+01	4.4651E+02	4.2578E+00	0.000E+00	1.677E-01
7.902609E+00	5.62210E+01	9.9078E+00	3.7652E+02	4.0218E+00	0.000E+00	1.569E-01
8.447890E+00	5.69654E+01	8.9174E+00	3.1701E+02	3.7909E+00	0.000E+00	1.468E-01
9.030794E+00	5.75029E+01	8.0097E+00	2.6636E+02	3.5660E+00	0.000E+00	1.373E-01
9.653919E+00	5.78541E+01	7.1500E+00	2.2242E+02	3.3477E+00	0.000E+00	1.284E-01
1.032004E+01	5.80788E+01	6.3882E+00	1.8590E+02	3.1368E+00	0.000E+00	1.201E-01
1.103212E+01	5.82206E+01	5.7128E+00	1.5551E+02	2.9336E+00	0.000E+00	1.124E-01
1.179334E+01	5.83774E+01	5.1034E+00	1.2996E+02	2.7386E+00	0.000E+00	1.051E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_x cm ² /g	λ nm
1.260708E+01	5.84490E+01	4.5487E+00	1.0836E+02	2.5521E+00	0.000E+00	9.834E-02
1.347697E+01	5.84781E+01	4.0450E+00	9.0138E+01	2.3743E+00	0.000E+00	9.200E-02
1.440688E+01	5.84372E+01	3.5928E+00	7.4894E+01	2.2053E+00	0.000E+00	8.606E-02
1.540095E+01	5.83727E+01	3.1939E+00	6.2282E+01	2.0452E+00	0.000E+00	8.050E-02
1.646362E+01	5.82934E+01	2.8418E+00	5.1838E+01	1.8939E+00	0.000E+00	7.531E-02
1.759961E+01	5.82044E+01	2.5302E+00	4.3175E+01	1.7514E+00	0.000E+00	7.045E-02
1.881398E+01	5.81087E+01	2.2547E+00	3.5991E+01	1.6175E+00	0.000E+00	6.590E-02
2.011215E+01	5.80087E+01	2.0111E+00	3.0030E+01	1.4921E+00	0.000E+00	6.165E-02
2.149988E+01	5.79055E+01	1.7954E+00	2.5079E+01	1.3749E+00	0.000E+00	5.767E-02
2.298338E+01	5.77995E+01	1.6044E+00	2.0964E+01	1.2656E+00	0.000E+00	5.395E-02
2.456923E+01	5.76904E+01	1.4350E+00	1.7540E+01	1.1641E+00	0.000E+00	5.046E-02
2.626450E+01	5.75765E+01	1.2815E+00	1.4654E+01	1.0699E+00	0.000E+00	4.721E-02
2.807676E+01	5.74526E+01	1.1348E+00	1.2138E+01	9.8276E-01	0.000E+00	4.416E-02
3.001405E+01	5.73038E+01	9.9927E-01	9.9985E+00	9.0230E-01	0.000E+00	4.131E-02
3.208502E+01	5.71194E+01	8.7956E-01	8.2327E+00	8.2818E-01	0.000E+00	3.864E-02
3.429889E+01	5.68744E+01	7.7465E-01	6.7828E+00	7.6004E-01	0.000E+00	3.615E-02
3.666551E+01	5.64958E+01	6.8282E-01	5.5928E+00	6.9753E-01	0.000E+00	3.381E-02
3.919543E+01	5.56078E+01	6.0237E-01	4.6154E+00	6.4029E-01	0.000E+00	3.163E-02
3.963414E+01	5.52451E+01	5.8995E-01	4.4702E+00	6.3123E-01	0.000E+00	3.128E-02
4.024079E+01	5.40411E+01	5.7343E-01	4.2795E+00	6.1909E-01	0.000E+00	3.081E-02
4.040256E+01	5.25980E+01	5.6915E-01	4.2305E+00	6.1592E-01	0.000E+00	3.069E-02
4.064522E+01	5.40571E+01	3.4044E+00	2.5154E+01	6.1123E-01	2.100E+01	3.050E-02
4.125186E+01	5.53764E+01	3.3261E+00	2.4214E+01	5.9978E-01	2.023E+01	3.006E-02
4.189992E+01	5.59523E+01	3.2457E+00	2.3263E+01	5.8798E-01	1.945E+01	2.959E-02
4.479101E+01	5.70307E+01	2.9144E+00	1.9540E+01	5.4026E-01	1.639E+01	2.768E-02
4.788159E+01	5.75239E+01	2.6115E+00	1.6379E+01	4.9680E-01	1.377E+01	2.589E-02
5.118542E+01	5.78210E+01	2.3382E+00	1.3719E+01	4.5727E-01	1.156E+01	2.422E-02
5.471721E+01	5.80169E+01	2.0897E+00	1.1469E+01	4.2138E-01	9.682E+00	2.266E-02
5.849270E+01	5.81468E+01	1.8652E+00	9.5765E+00	3.8883E-01	8.094E+00	2.120E-02
6.252870E+01	5.82336E+01	1.6646E+00	7.9950E+00	3.5935E-01	6.765E+00	1.983E-02
6.684318E+01	5.82911E+01	1.4854E+00	6.6739E+00	3.3267E-01	5.653E+00	1.855E-02
7.145536E+01	5.83279E+01	1.3254E+00	5.5705E+00	3.0855E-01	4.722E+00	1.735E-02
7.638578E+01	5.83503E+01	1.1825E+00	4.6491E+00	2.8676E-01	3.944E+00	1.623E-02
8.165640E+01	5.83941E+01	1.0531E+00	3.8732E+00	2.6709E-01	3.288E+00	1.518E-02
8.729069E+01	5.83944E+01	9.3251E-01	3.2082E+00	2.4932E-01	2.726E+00	1.420E-02
9.331374E+01	5.83864E+01	8.2579E-01	2.6577E+00	2.3328E-01	2.260E+00	1.329E-02
9.975239E+01	5.83732E+01	7.3135E-01	2.2018E+00	2.1879E-01	1.873E+00	1.243E-02
1.066353E+02	5.83567E+01	6.4777E-01	1.8243E+00	2.0570E-01	1.553E+00	1.163E-02
1.139931E+02	5.83381E+01	5.7379E-01	1.5117E+00	1.9386E-01	1.287E+00	1.088E-02
1.218587E+02	5.83185E+01	5.0831E-01	1.2527E+00	1.8314E-01	1.067E+00	1.017E-02
1.302669E+02	5.82983E+01	4.5033E-01	1.0382E+00	1.7341E-01	8.847E-01	9.518E-03
1.392553E+02	5.82782E+01	3.9900E-01	8.6047E-01	1.6457E-01	7.334E-01	8.903E-03
1.488640E+02	5.82583E+01	3.5354E-01	7.1323E-01	1.5651E-01	6.080E-01	8.329E-03
1.591356E+02	5.82391E+01	3.1329E-01	5.9123E-01	1.4916E-01	5.040E-01	7.791E-03
1.701159E+02	5.82206E+01	2.7764E-01	4.9013E-01	1.4242E-01	4.178E-01	7.288E-03
1.818539E+02	5.82029E+01	2.4629E-01	4.0673E-01	1.3622E-01	3.468E-01	6.818E-03
1.944018E+02	5.81864E+01	2.1867E-01	3.3780E-01	1.3050E-01	2.880E-01	6.378E-03
2.078156E+02	5.81710E+01	1.9415E-01	2.8057E-01	1.2520E-01	2.393E-01	5.966E-03
2.221548E+02	5.81566E+01	1.7240E-01	2.3305E-01	1.2027E-01	1.987E-01	5.581E-03
2.374835E+02	5.81432E+01	1.5309E-01	1.9359E-01	1.1566E-01	1.651E-01	5.221E-03
2.538699E+02	5.81308E+01	1.3595E-01	1.6082E-01	1.1134E-01	1.371E-01	4.884E-03
2.713869E+02	5.81193E+01	1.2074E-01	1.3361E-01	1.0726E-01	1.139E-01	4.569E-03
2.901126E+02	5.81087E+01	1.0723E-01	1.1101E-01	1.0340E-01	9.462E-02	4.274E-03
3.101304E+02	5.80989E+01	9.5245E-02	9.2231E-02	9.9723E-02	7.859E-02	3.998E-03
3.315294E+02	5.80899E+01	8.4601E-02	7.6636E-02	9.6218E-02	6.528E-02	3.740E-03
3.544049E+02	5.80817E+01	7.5151E-02	6.3681E-02	9.2858E-02	5.423E-02	3.498E-03
3.788588E+02	5.80742E+01	6.6759E-02	5.2919E-02	8.9628E-02	4.504E-02	3.273E-03
4.050001E+02	5.80673E+01	5.9308E-02	4.3978E-02	8.6512E-02	3.742E-02	3.061E-03
4.329451E+02	5.80609E+01	5.2690E-02	3.6549E-02	8.3497E-02	3.108E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 419

Pr Z = 59

Atomic weight = 1.409077E+02 g/mol, nominal density ρ (g/cm³) = 6.7610E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.33983E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.98637E+05

18 edges. Edge energies (keV):

K		4.19906E+00	L	I	6.83480E+00	L	II	6.44040E+00	L	III	5.96430E+00
M	I	1.51100E+00	M	II	1.33740E+00	M	III	1.24220E+00	M	IV	9.51100E-01
M	V	9.31000E-00	N	I	3.04500E-00	N	II	2.36300E-00	N	III	2.17600E-01
N	IV	1.13200E-00	N	V	1.13200E-00	O	I	3.50000E-03	O	II	3.74000E-02
O	III	2.23000E-02	N	VI	2.23000E-02						

Relativistic correction estimate f_{rel} (H82.3/5CL) = -8.0832E-01, -4.9140E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.3552E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.72146E+01	2.3728E-01	6.6288E+03	1.7761E-04	0.000E+00	1.160E+02
1.142761E-02	1.71786E+01	2.6237E-01	6.8564E+03	2.4216E-04	0.000E+00	1.085E+02
1.221612E-02	1.70636E+01	2.9076E-01	7.1080E+03	3.2846E-04	0.000E+00	1.015E+02
1.305903E-02	1.69241E+01	3.2288E-01	7.3837E+03	4.4321E-04	0.000E+00	9.494E+01
1.396010E-02	1.67523E+01	3.5918E-01	7.6836E+03	5.9495E-04	0.000E+00	8.881E+01
1.492335E-02	1.65360E+01	4.0006E-01	8.0058E+03	7.9455E-04	0.000E+00	8.308E+01
1.595306E-02	1.62553E+01	4.4589E-01	8.3470E+03	1.0557E-03	0.000E+00	7.772E+01
1.705382E-02	1.58752E+01	4.9710E-01	8.7050E+03	1.3956E-03	0.000E+00	7.270E+01
1.823053E-02	1.53259E+01	5.5414E-01	9.0774E+03	1.8355E-03	0.000E+00	6.801E+01
1.948844E-02	1.44414E+01	6.1742E-01	9.4612E+03	2.4021E-03	0.000E+00	6.362E+01
2.083314E-02	1.26571E+01	6.8733E-01	9.8528E+03	3.1278E-03	0.000E+00	5.951E+01
2.185400E-02	8.78438E+00	7.4176E-01	1.0136E+04	3.7680E-03	0.000E+00	5.673E+01
2.218850E-02	3.65754E+00	7.5981E-01	1.0226E+04	3.9954E-03	0.000E+00	5.588E+01
2.227063E-02	-1.56890E+00	7.6426E-01	1.0248E+04	4.0526E-03	0.000E+00	5.567E+01
2.227770E-02	-2.66574E+00	7.6464E-01	1.0250E+04	4.0575E-03	0.000E+00	5.565E+01
2.241150E-02	4.16438E+00	1.3314E+01	1.7741E+05	4.1519E-03	0.000E+00	5.532E+01
2.274600E-02	1.02066E+01	1.2834E+01	1.6851E+05	4.3943E-03	0.000E+00	5.451E+01
2.380730E-02	1.57662E+01	1.1483E+01	1.4405E+05	5.2248E-03	0.000E+00	5.208E+01
2.545001E-02	1.90008E+01	9.7813E+00	1.1478E+05	6.7032E-03	0.000E+00	4.872E+01
2.720606E-02	2.06242E+01	8.2672E+00	9.0748E+04	8.5580E-03	0.000E+00	4.557E+01
2.908327E-02	2.14648E+01	6.9800E+00	7.1673E+04	1.0873E-02	0.000E+00	4.263E+01
3.109002E-02	2.18593E+01	5.9361E+00	5.7019E+04	1.3748E-02	0.000E+00	3.988E+01
3.323523E-02	2.19930E+01	5.1215E+00	4.6020E+04	1.7300E-02	0.000E+00	3.731E+01
3.552846E-02	2.19770E+01	4.5077E+00	3.7889E+04	2.1666E-02	0.000E+00	3.490E+01
3.665200E-02	2.19361E+01	4.2806E+00	3.4878E+04	2.4025E-02	0.000E+00	3.383E+01
3.721300E-02	2.19051E+01	4.1821E+00	3.3561E+04	2.5259E-02	0.000E+00	3.332E+01
3.736260E-02	2.18881E+01	4.1573E+00	3.3229E+04	2.5594E-02	0.000E+00	3.318E+01
3.758700E-02	2.18891E+01	4.1426E+00	3.2914E+04	2.6102E-02	0.000E+00	3.299E+01
3.797993E-02	2.18795E+01	4.0837E+00	3.2111E+04	2.7005E-02	0.000E+00	3.264E+01
3.814800E-02	2.18737E+01	4.0597E+00	3.1781E+04	2.7397E-02	0.000E+00	3.250E+01
4.060054E-02	2.17708E+01	3.7806E+00	2.7808E+04	3.3503E-02	0.000E+00	3.054E+01
4.340198E-02	2.16522E+01	3.5873E+00	2.4683E+04	4.1371E-02	0.000E+00	2.857E+01
4.639671E-02	2.15466E+01	3.4800E+00	2.2399E+04	5.0849E-02	0.000E+00	2.672E+01
4.959809E-02	2.14645E+01	3.4368E+00	2.0694E+04	6.2212E-02	0.000E+00	2.500E+01
5.302035E-02	2.13979E+01	3.4456E+00	1.9408E+04	7.5766E-02	0.000E+00	2.338E+01
5.667876E-02	2.13576E+01	3.4962E+00	1.8421E+04	9.1854E-02	0.000E+00	2.187E+01
6.058959E-02	2.13462E+01	3.5799E+00	1.7645E+04	1.1086E-01	0.000E+00	2.046E+01
6.477028E-02	2.13678E+01	3.6904E+00	1.7015E+04	1.3319E-01	0.000E+00	1.914E+01
6.923942E-02	2.14186E+01	3.6967E+00	1.5944E+04	1.5931E-01	0.000E+00	1.791E+01
7.401695E-02	2.14093E+01	3.6665E+00	1.4793E+04	1.8972E-01	0.000E+00	1.675E+01
7.912411E-02	2.13305E+01	3.6299E+00	1.3700E+04	2.2494E-01	0.000E+00	1.567E+01
8.458368E-02	2.11444E+01	3.5846E+00	1.2656E+04	2.6553E-01	0.000E+00	1.466E+01
9.041995E-02	2.07735E+01	3.5296E+00	1.1658E+04	3.1209E-01	0.000E+00	1.371E+01
9.665893E-02	2.00352E+01	3.4646E+00	1.0704E+04	3.6525E-01	0.000E+00	1.283E+01
1.033284E-01	1.83476E+01	3.3896E+00	9.7964E+03	4.2564E-01	0.000E+00	1.200E+01
1.104581E-01	1.16068E+01	3.3048E+00	8.9349E+03	4.9391E-01	0.000E+00	1.122E+01
1.109360E-01	1.03019E+01	3.2990E+00	8.8808E+03	4.9861E-01	0.000E+00	1.118E+01
1.126340E-01	-9.81412E-01	3.2783E+00	8.6920E+03	5.1545E-01	0.000E+00	1.101E+01
1.130868E-01	-1.67885E+01	3.2727E+00	8.6425E+03	5.1998E-01	0.000E+00	1.096E+01
1.137660E-01	3.85738E+00	3.5265E+01	9.2570E+04	5.2679E-01	0.000E+00	1.090E+01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.154640E-01	2.10277E+01	2.8922E+01	7.4804E+04	5.4394E-01	0.000E+00	1.074E+01
1.180797E-01	2.86936E+01	2.1620E+01	5.4680E+04	5.7072E-01	0.000E+00	1.050E+01
1.262272E-01	3.14534E+01	9.9813E+00	2.3614E+04	6.5674E-01	0.000E+00	9.822E+00
1.349368E-01	2.96178E+01	6.1318E+00	1.3571E+04	7.5259E-01	0.000E+00	9.188E+00
1.442475E-01	2.82581E+01	4.7184E+00	9.7685E+03	8.5888E-01	0.000E+00	8.595E+00
1.542005E-01	2.73603E+01	4.0747E+00	7.8914E+03	9.7620E-01	0.000E+00	8.040E+00
1.648404E-01	2.67195E+01	3.7343E+00	6.7654E+03	1.1051E+00	0.000E+00	7.521E+00
1.762144E-01	2.62060E+01	3.5421E+00	6.0030E+03	1.2459E+00	0.000E+00	7.036E+00
1.883732E-01	2.57360E+01	3.4409E+00	5.4551E+03	1.3991E+00	0.000E+00	6.582E+00
2.013709E-01	2.52247E+01	3.4093E+00	5.0560E+03	1.5649E+00	0.000E+00	6.157E+00
2.132480E-01	2.45328E+01	3.4319E+00	4.8061E+03	1.7175E+00	0.000E+00	5.814E+00
2.152655E-01	2.42898E+01	3.4399E+00	4.7722E+03	1.7435E+00	0.000E+00	5.760E+00
2.165120E-01	2.40212E+01	3.4454E+00	4.7523E+03	1.7596E+00	0.000E+00	5.726E+00
2.173824E-01	2.34988E+01	3.4495E+00	4.7389E+03	1.7708E+00	0.000E+00	5.704E+00
2.186880E-01	2.39617E+01	4.4336E+00	6.0545E+03	1.7876E+00	0.000E+00	5.669E+00
2.219520E-01	2.43073E+01	4.4636E+00	6.0058E+03	1.8297E+00	0.000E+00	5.586E+00
2.301188E-01	2.44087E+01	4.5497E+00	5.9043E+03	1.9349E+00	0.000E+00	5.388E+00
2.315740E-01	2.43919E+01	4.5665E+00	5.8890E+03	1.9537E+00	0.000E+00	5.354E+00
2.351185E-01	2.42640E+01	4.6095E+00	5.8548E+03	1.9993E+00	0.000E+00	5.273E+00
2.360637E-01	2.40994E+01	4.6214E+00	5.8464E+03	2.0115E+00	0.000E+00	5.252E+00
2.374815E-01	2.42665E+01	4.9652E+00	6.2438E+03	2.0297E+00	0.000E+00	5.221E+00
2.410260E-01	2.44103E+01	5.0167E+00	6.2159E+03	2.0753E+00	0.000E+00	5.144E+00
2.459970E-01	2.44805E+01	5.0924E+00	6.1821E+03	2.1391E+00	0.000E+00	5.040E+00
2.629708E-01	2.45523E+01	5.3744E+00	6.1034E+03	2.3557E+00	0.000E+00	4.715E+00
2.811158E-01	2.45591E+01	5.7025E+00	6.0579E+03	2.5845E+00	0.000E+00	4.410E+00
2.984100E-01	2.44528E+01	6.0245E+00	6.0291E+03	2.7989E+00	0.000E+00	4.155E+00
3.005128E-01	2.43988E+01	6.0636E+00	6.0258E+03	2.8247E+00	0.000E+00	4.126E+00
3.029775E-01	2.42591E+01	6.1093E+00	6.0218E+03	2.8549E+00	0.000E+00	4.092E+00
3.041955E-01	2.40036E+01	6.1318E+00	6.0198E+03	2.8698E+00	0.000E+00	4.076E+00
3.060225E-01	2.42818E+01	6.6829E+00	6.5216E+03	2.8921E+00	0.000E+00	4.051E+00
3.105900E-01	2.45476E+01	6.7700E+00	6.5094E+03	2.9476E+00	0.000E+00	3.992E+00
3.212482E-01	2.48143E+01	6.9693E+00	6.4787E+03	3.0388E+00	0.000E+00	3.859E+00
3.434143E-01	2.51989E+01	7.3577E+00	6.3984E+03	3.3368E+00	0.000E+00	3.610E+00
3.671099E-01	2.55909E+01	7.7181E+00	6.2785E+03	3.6066E+00	0.000E+00	3.377E+00
3.924405E-01	2.60096E+01	8.0300E+00	6.1107E+03	3.8840E+00	0.000E+00	3.159E+00
4.195189E-01	2.64465E+01	8.2777E+00	5.8925E+03	4.1677E+00	0.000E+00	2.955E+00
4.484657E-01	2.68823E+01	8.4482E+00	5.6258E+03	4.4561E+00	0.000E+00	2.765E+00
4.794098E-01	2.72919E+01	8.5326E+00	5.3152E+03	4.7475E+00	0.000E+00	2.586E+00
5.124891E-01	2.76374E+01	8.5245E+00	4.9674E+03	5.0402E+00	0.000E+00	2.419E+00
5.478508E-01	2.78793E+01	8.4340E+00	4.5975E+03	5.3323E+00	0.000E+00	2.263E+00
5.856525E-01	2.79771E+01	8.2746E+00	4.2194E+03	5.6217E+00	0.000E+00	2.117E+00
6.260625E-01	2.78830E+01	8.0606E+00	3.8450E+03	5.9066E+00	0.000E+00	1.980E+00
6.692609E-01	2.75307E+01	7.8062E+00	3.4833E+03	6.1849E+00	0.000E+00	1.853E+00
7.154399E-01	2.68172E+01	7.5237E+00	3.1405E+03	6.4545E+00	0.000E+00	1.733E+00
7.648052E-01	2.55391E+01	7.2236E+00	2.8206E+03	6.7134E+00	0.000E+00	1.621E+00
8.175768E-01	2.32365E+01	6.9148E+00	2.5258E+03	6.9597E+00	0.000E+00	1.516E+00
8.739896E-01	1.83938E+01	6.6041E+00	2.2566E+03	7.1913E+00	0.000E+00	1.419E+00
9.123800E-01	9.90448E+00	6.4050E+00	2.0965E+03	7.3321E+00	0.000E+00	1.359E+00
9.263450E-01	-1.85307E-01	6.3351E+00	2.0423E+03	7.3801E+00	0.000E+00	1.338E+00
9.300690E-01	-1.10922E+01	6.3167E+00	2.0282E+03	7.3926E+00	0.000E+00	1.333E+00
9.320780E-01	-1.03377E+01	2.6811E+01	8.5904E+03	7.3993E+00	0.000E+00	1.330E+00
9.342948E-01	-3.36199E+00	2.6698E+01	8.5336E+03	7.4067E+00	0.000E+00	1.327E+00
9.356550E-01	-1.35468E+00	2.6628E+01	8.4991E+03	7.4112E+00	0.000E+00	1.325E+00
9.463445E-01	2.11908E+00	2.6093E+01	8.2341E+03	7.4460E+00	0.000E+00	1.310E+00
9.501489E-01	-3.13253E+00	2.5906E+01	8.1425E+03	7.4582E+00	0.000E+00	1.305E+00
9.558555E-01	6.00182E+00	3.9126E+01	1.2224E+04	7.4763E+00	0.000E+00	1.297E+00
9.701220E-01	1.56757E+01	3.8024E+01	1.1705E+04	7.5203E+00	0.000E+00	1.278E+00
9.987612E-01	2.39928E+01	3.5955E+01	1.0751E+04	7.6040E+00	0.000E+00	1.241E+00
1.067676E+00	3.26129E+01	3.1912E+01	8.9260E+03	7.7818E+00	0.000E+00	1.161E+00
1.141345E+00	3.67032E+01	2.8707E+01	7.5112E+03	7.9387E+00	0.000E+00	1.086E+00
1.217356E+00	3.78194E+01	2.6058E+01	6.3925E+03	8.0694E+00	0.000E+00	1.018E+00
1.220098E+00	3.77470E+01	2.5972E+01	6.3571E+03	8.0736E+00	0.000E+00	1.016E+00
1.235989E+00	3.64995E+01	2.5485E+01	6.1576E+03	8.0971E+00	0.000E+00	1.003E+00
1.240958E+00	3.44409E+01	2.5336E+01	6.0972E+03	8.1042E+00	0.000E+00	9.991E-01
1.248411E+00	3.68305E+01	2.9405E+01	7.0341E+03	8.1147E+00	0.000E+00	9.931E-01

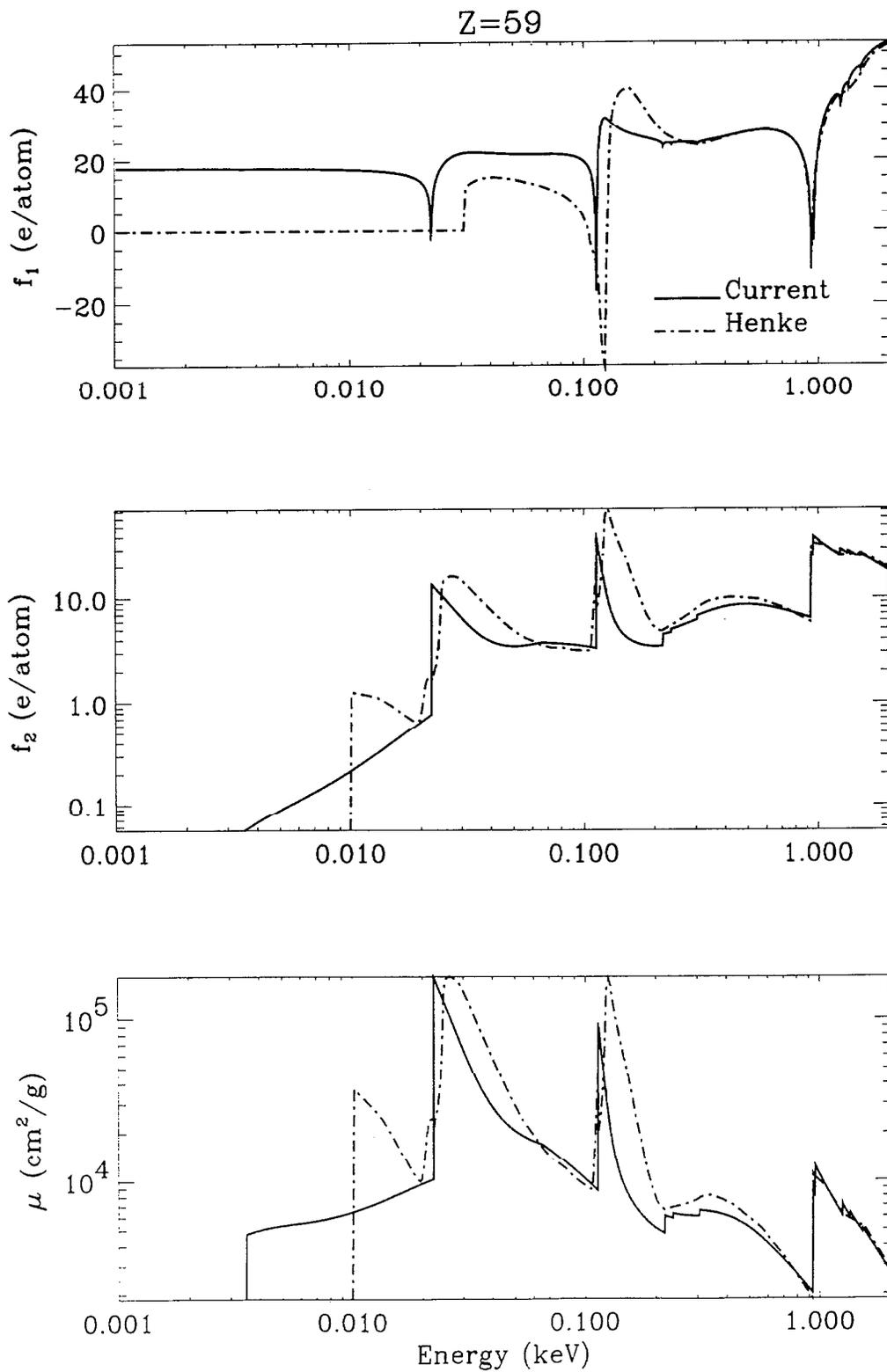
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 421

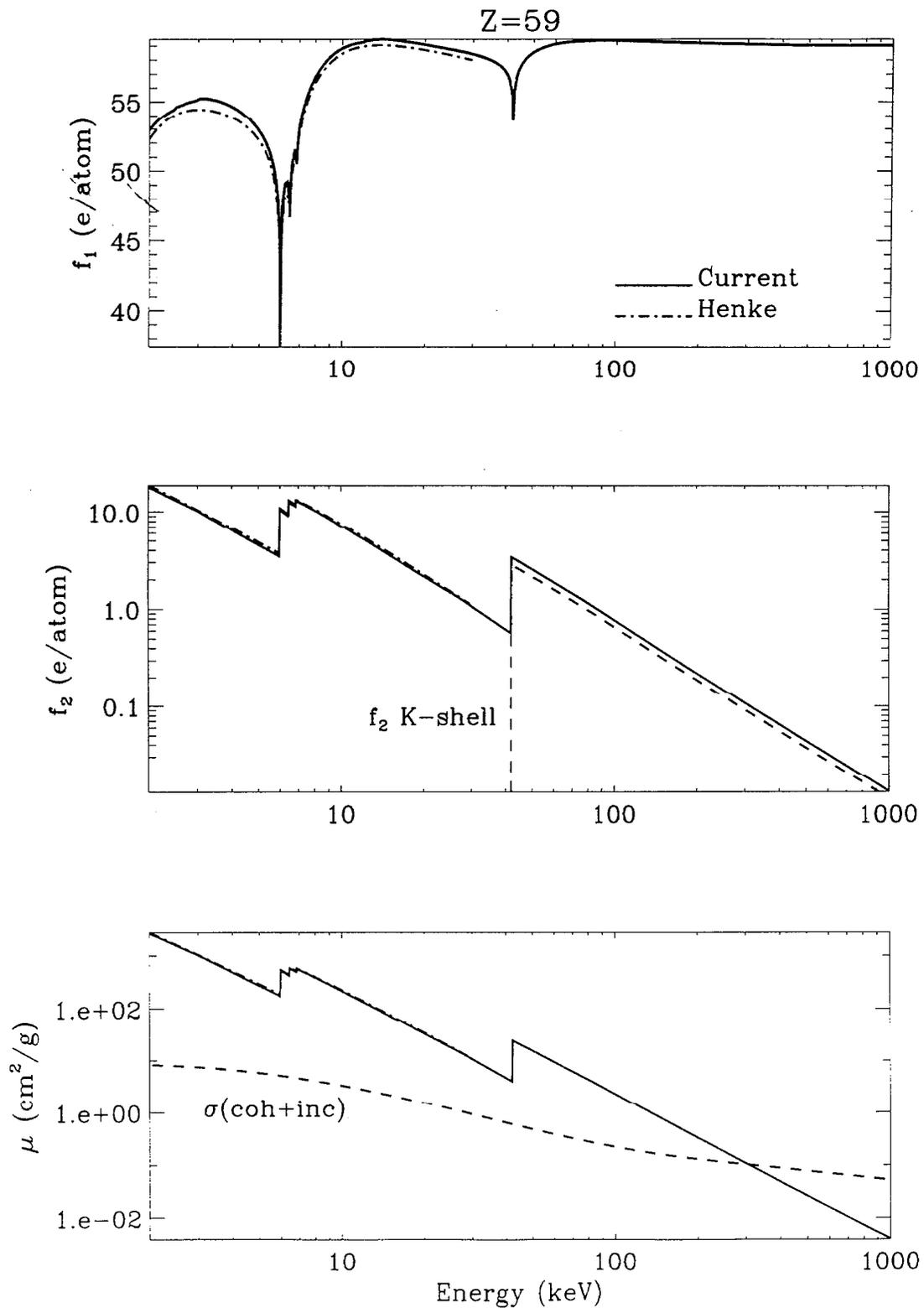
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
1.267044E+00	3.91981E+01	2.8731E+01	6.7719E+03	8.1397E+00	0.000E+00	9.785E-01
1.304285E+00	4.09346E+01	2.7473E+01	6.2903E+03	8.1854E+00	0.000E+00	9.506E-01
1.310652E+00	4.10718E+01	2.7287E+01	6.2175E+03	8.1927E+00	0.000E+00	9.460E-01
1.330713E+00	4.10160E+01	2.6726E+01	5.9979E+03	8.2144E+00	0.000E+00	9.317E-01
1.336063E+00	4.02641E+01	2.6582E+01	5.9417E+03	8.2200E+00	0.000E+00	9.280E-01
1.344087E+00	4.14509E+01	2.8188E+01	6.2631E+03	8.2281E+00	0.000E+00	9.224E-01
1.364148E+00	4.28521E+01	2.7617E+01	6.0458E+03	8.2473E+00	0.000E+00	9.089E-01
1.394281E+00	4.40113E+01	2.6813E+01	5.7429E+03	8.2735E+00	0.000E+00	8.892E-01
1.480780E+00	4.58154E+01	2.4922E+01	5.0262E+03	8.3322E+00	0.000E+00	8.373E-01
1.490486E+00	4.58831E+01	2.4735E+01	4.9561E+03	8.3373E+00	0.000E+00	8.318E-01
1.503445E+00	4.57859E+01	2.4492E+01	4.8651E+03	8.3438E+00	0.000E+00	8.247E-01
1.509489E+00	4.53126E+01	2.4381E+01	4.8236E+03	8.3467E+00	0.000E+00	8.214E-01
1.518555E+00	4.60868E+01	2.5383E+01	4.9918E+03	8.3508E+00	0.000E+00	8.165E-01
1.541220E+00	4.70452E+01	2.4974E+01	4.8391E+03	8.3601E+00	0.000E+00	8.045E-01
1.593329E+00	4.83610E+01	2.4063E+01	4.5102E+03	8.3766E+00	0.000E+00	7.781E-01
1.703269E+00	5.02510E+01	2.2110E+01	3.8766E+03	8.3911E+00	0.000E+00	7.279E-01
1.820795E+00	5.16042E+01	2.0250E+01	3.3213E+03	8.3811E+00	0.000E+00	6.809E-01
1.946430E+00	5.26024E+01	1.8518E+01	2.8412E+03	8.3469E+00	0.000E+00	6.370E-01
2.080733E+00	5.33495E+01	1.6915E+01	2.4277E+03	8.2892E+00	0.000E+00	5.959E-01
2.224304E+00	5.38968E+01	1.5428E+01	2.0714E+03	8.2085E+00	0.000E+00	5.574E-01
2.377781E+00	5.42865E+01	1.4073E+01	1.7675E+03	8.1060E+00	0.000E+00	5.214E-01
2.541848E+00	5.46680E+01	1.2844E+01	1.5090E+03	7.9826E+00	0.000E+00	4.878E-01
2.717235E+00	5.49099E+01	1.1717E+01	1.2877E+03	7.8397E+00	0.000E+00	4.563E-01
2.904724E+00	5.50655E+01	1.0692E+01	1.0993E+03	7.6786E+00	0.000E+00	4.268E-01
3.105150E+00	5.52498E+01	9.6854E+00	9.3150E+02	7.5008E+00	0.000E+00	3.993E-01
3.319406E+00	5.51905E+01	8.7117E+00	7.8377E+02	7.3079E+00	0.000E+00	3.735E-01
3.548445E+00	5.50442E+01	7.8467E+00	6.6038E+02	7.1015E+00	0.000E+00	3.494E-01
3.793288E+00	5.48333E+01	7.0689E+00	5.5652E+02	6.8833E+00	0.000E+00	3.269E-01
4.055024E+00	5.45398E+01	6.3421E+00	4.6707E+02	6.6550E+00	0.000E+00	3.058E-01
4.334821E+00	5.41509E+01	5.6964E+00	3.9244E+02	6.4182E+00	0.000E+00	2.860E-01
4.633924E+00	5.36469E+01	5.1242E+00	3.3023E+02	6.1747E+00	0.000E+00	2.676E-01
4.953664E+00	5.29708E+01	4.6174E+00	2.7837E+02	5.9261E+00	0.000E+00	2.503E-01
5.295467E+00	5.19742E+01	4.1684E+00	2.3508E+02	5.6740E+00	0.000E+00	2.341E-01
5.660855E+00	5.01049E+01	3.7541E+00	1.9805E+02	5.4200E+00	0.000E+00	2.190E-01
5.845014E+00	4.79480E+01	3.5682E+00	1.8231E+02	5.2978E+00	0.000E+00	2.121E-01
5.934479E+00	4.48046E+01	3.4816E+00	1.7520E+02	5.2398E+00	0.000E+00	2.089E-01
5.958336E+00	4.11580E+01	3.4592E+00	1.7338E+02	5.2245E+00	0.000E+00	2.081E-01
5.994122E+00	4.47709E+01	1.0518E+01	5.2403E+02	5.2017E+00	0.000E+00	2.068E-01
6.051453E+00	4.71935E+01	1.0305E+01	5.0854E+02	5.1654E+00	0.000E+00	2.049E-01
6.083586E+00	4.78639E+01	1.0188E+01	5.0013E+02	5.1452E+00	0.000E+00	2.038E-01
6.311592E+00	4.92910E+01	9.4366E+00	4.4650E+02	5.0052E+00	0.000E+00	1.964E-01
6.408198E+00	4.83098E+01	9.1775E+00	4.2769E+02	4.9475E+00	0.000E+00	1.935E-01
6.433960E+00	4.66523E+01	9.1113E+00	4.2291E+02	4.9323E+00	0.000E+00	1.927E-01
6.469004E+00	4.84282E+01	1.2493E+01	5.7675E+02	4.9117E+00	0.000E+00	1.917E-01
6.472602E+00	4.85756E+01	1.2481E+01	5.7586E+02	4.9096E+00	0.000E+00	1.916E-01
6.569208E+00	5.04377E+01	1.2156E+01	5.5263E+02	4.8535E+00	0.000E+00	1.887E-01
6.698104E+00	5.13533E+01	1.1748E+01	5.2381E+02	4.7801E+00	0.000E+00	1.851E-01
6.800626E+00	5.12799E+01	1.1445E+01	5.0261E+02	4.7229E+00	0.000E+00	1.823E-01
6.827965E+00	5.05336E+01	1.1368E+01	4.9722E+02	4.7078E+00	0.000E+00	1.816E-01
6.868974E+00	5.16492E+01	1.3028E+01	5.6642E+02	4.6853E+00	0.000E+00	1.805E-01
6.915365E+00	5.23747E+01	1.2896E+01	5.5689E+02	4.6601E+00	0.000E+00	1.793E-01
6.971496E+00	5.29391E+01	1.2739E+01	5.4570E+02	4.6298E+00	0.000E+00	1.778E-01
7.392525E+00	5.51795E+01	1.1668E+01	4.7136E+02	4.4117E+00	0.000E+00	1.677E-01
7.902609E+00	5.66130E+01	1.0546E+01	3.9854E+02	4.1677E+00	0.000E+00	1.569E-01
8.417890E+00	5.75552E+01	9.5034E+00	3.3595E+02	3.9291E+00	0.000E+00	1.468E-01
9.030794E+00	5.82224E+01	8.5385E+00	2.8235E+02	3.6965E+00	0.000E+00	1.373E-01
9.653919E+00	5.86655E+01	7.6226E+00	2.3580E+02	3.4708E+00	0.000E+00	1.284E-01
1.032004E+01	5.89521E+01	6.8109E+00	1.9709E+02	3.2526E+00	0.000E+00	1.201E-01
1.103212E+01	5.91366E+01	6.0909E+00	1.6488E+02	3.0424E+00	0.000E+00	1.124E-01
1.179334E+01	5.92527E+01	5.4519E+00	1.3806E+02	2.8406E+00	0.000E+00	1.051E-01
1.260708E-01	5.93873E+01	4.8664E+00	1.1527E+02	2.6476E+00	0.000E+00	9.834E-02
1.347697E+01	5.94424E+01	4.3371E+00	9.6105E+01	2.4634E+00	0.000E+00	9.200E-02
1.440688E-01	5.94585E+01	3.8547E+00	7.9904E+01	2.2884E+00	0.000E+00	8.606E-02
1.540095E+01	5.94080E+01	3.4263E+00	6.6439E+01	2.1225E+00	0.000E+00	8.050E-02
1.646362E+01	5.93379E+01	3.0482E+00	5.5292E+01	1.9657E+00	0.000E+00	7.531E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV --- Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.759961E+01	5.92553E+01	2.7141E+00	4.6054E+01	1.8180E+00	0.000E+00	7.045E-02
1.881398E+01	5.91643E+01	2.4183E+00	3.8386E+01	1.6792E+00	0.000E+00	6.590E-02
2.011215E+01	5.90678E+01	2.1566E+00	3.2023E+01	1.5491E+00	0.000E+00	6.165E-02
2.149988E+01	5.89673E+01	1.9251E+00	2.6740E+01	1.4275E+00	0.000E+00	5.767E-02
2.298338E+01	5.88640E+01	1.7200E+00	2.2349E+01	1.3141E+00	0.000E+00	5.395E-02
2.456923E+01	5.87578E+01	1.5382E+00	1.8697E+01	1.2087E+00	0.000E+00	5.046E-02
2.626450E+01	5.86484E+01	1.3762E+00	1.5648E+01	1.1109E+00	0.000E+00	4.721E-02
2.807676E+01	5.85341E+01	1.2199E+00	1.2975E+01	1.0203E+00	0.000E+00	4.416E-02
3.001405E+01	5.83990E+01	1.0772E+00	1.0718E+01	9.3674E-01	0.000E+00	4.131E-02
3.208502E+01	5.82361E+01	9.4878E-01	8.8310E+00	8.5969E-01	0.000E+00	3.864E-02
3.429889E+01	5.80303E+01	8.3572E-01	7.2766E+00	7.8884E-01	0.000E+00	3.615E-02
3.666551E+01	5.77427E+01	7.3670E-01	6.0004E+00	7.2382E-01	0.000E+00	3.381E-02
3.919543E+01	5.72414E+01	6.4993E-01	4.9520E+00	6.6427E-01	0.000E+00	3.163E-02
4.115079E+01	5.62616E+01	5.9345E-01	4.3067E+00	6.2406E-01	0.000E+00	3.013E-02
4.178065E+01	5.50638E+01	5.7690E-01	4.1235E+00	6.1205E-01	0.000E+00	2.968E-02
4.189992E+01	5.43184E+01	5.7385E-01	4.0900E+00	6.0983E-01	0.000E+00	2.959E-02
4.194861E+01	5.36280E+01	5.7261E-01	4.0765E+00	6.0892E-01	0.000E+00	2.956E-02
4.220055E+01	5.50800E+01	3.3934E+00	2.4014E+01	6.0428E-01	2.001E+01	2.938E-02
4.283041E+01	5.63927E+01	3.3149E+00	2.3113E+01	5.9297E-01	1.927E+01	2.895E-02
4.479101E+01	5.75729E+01	3.0868E+00	2.0580E+01	5.6015E-01	1.720E+01	2.768E-02
4.788159E+01	5.82861E+01	2.7683E+00	1.7266E+01	5.1489E-01	1.447E+01	2.589E-02
5.118542E+01	5.86719E+01	2.4801E+00	1.4470E+01	4.7372E-01	1.215E+01	2.422E-02
5.471721E+01	5.89167E+01	2.2208E+00	1.2121E+01	4.3632E-01	1.020E+01	2.266E-02
5.849270E+01	5.90794E+01	1.9833E+00	1.0126E+01	4.0240E-01	8.535E+00	2.120E-02
6.252870E+01	5.91879E+01	1.7708E+00	8.4571E+00	3.7168E-01	7.137E+00	1.983E-02
6.684318E+01	5.92606E+01	1.5808E+00	7.0626E+00	3.4387E-01	5.967E+00	1.855E-02
7.145536E+01	5.93083E+01	1.4110E+00	5.8973E+00	3.1872E-01	4.987E+00	1.735E-02
7.638578E+01	5.93386E+01	1.2594E+00	4.9238E+00	2.9600E-01	4.167E+00	1.623E-02
8.165640E+01	5.93582E+01	1.1226E+00	4.1057E+00	2.7548E-01	3.478E+00	1.518E-02
8.729069E+01	5.93943E+01	9.9577E-01	3.4067E+00	2.5696E-01	2.889E+00	1.420E-02
9.331374E+01	5.93901E+01	8.8198E-01	2.8227E+00	2.4023E-01	2.396E+00	1.329E-02
9.973239E+01	5.93794E+01	7.8127E-01	2.3390E+00	2.2513E-01	1.987E+00	1.243E-02
1.066353E+02	5.93645E+01	6.9213E-01	1.9383E+00	2.1148E-01	1.647E+00	1.163E-02
1.139931E+02	5.93470E+01	6.1320E-01	1.6065E+00	1.9914E-01	1.366E+00	1.088E-02
1.218587E+02	5.93279E+01	5.4333E-01	1.3315E+00	1.8797E-01	1.133E+00	1.017E-02
1.302669E+02	5.93081E+01	4.8145E-01	1.1037E+00	1.7784E-01	9.393E-01	9.518E-03
1.392553E+02	5.92879E+01	4.2666E-01	9.1499E-01	1.6864E-01	7.789E-01	8.903E-03
1.488640E+02	5.92680E+01	3.7813E-01	7.5857E-01	1.6026E-01	6.459E-01	8.329E-03
1.591356E+02	5.92485E+01	3.3515E-01	6.2894E-01	1.5261E-01	5.356E-01	7.791E-03
1.701159E+02	5.92296E+01	2.9707E-01	5.2150E-01	1.4561E-01	4.441E-01	7.288E-03
1.818539E+02	5.92114E+01	2.6334E-01	4.3245E-01	1.3918E-01	3.683E-01	6.818E-03
1.944018E+02	5.91943E+01	2.3394E-01	3.5938E-01	1.3324E-01	3.061E-01	6.378E-03
2.078156E+02	5.91783E+01	2.0785E-01	2.9869E-01	1.2775E-01	2.545E-01	5.966E-03
2.221548E+02	5.91635E+01	1.8468E-01	2.4826E-01	1.2265E-01	2.116E-01	5.581E-03
2.374835E+02	5.91496E+01	1.6410E-01	2.0635E-01	1.1789E-01	1.759E-01	5.221E-03
2.538699E+02	5.91368E+01	1.4582E-01	1.7154E-01	1.1342E-01	1.462E-01	4.884E-03
2.713869E+02	5.91249E+01	1.2959E-01	1.4260E-01	1.0921E-01	1.215E-01	4.569E-03
2.901126E+02	5.91139E+01	1.1517E-01	1.1855E-01	1.0523E-01	1.010E-01	4.274E-03
3.101304E+02	5.91037E+01	1.0236E-01	9.8564E-02	1.0145E-01	8.399E-02	3.998E-03
3.315294E+02	5.90944E+01	9.0977E-02	8.1951E-02	9.7843E-02	6.982E-02	3.740E-03
3.544049E+02	5.90858E+01	8.0867E-02	6.8142E-02	9.4390E-02	5.804E-02	3.498E-03
3.788588E+02	5.90779E+01	7.1883E-02	5.6662E-02	9.1073E-02	4.825E-02	3.273E-03
4.050001E+02	5.90707E+01	6.3900E-02	4.7119E-02	8.7876E-02	4.011E-02	3.061E-03
4.329451E+02	5.90641E+01	5.6807E-02	3.9184E-02	8.4786E-02	3.335E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 425

Nd Z = 60

Atomic weight = 1.442400E+02 g/mol, nominal density ρ (g/cm³) = 6.9940E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.39516E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.91738E+05

§ edges. Edge energies (keV):

K		4.35689E+00	L	I	7.12600E+00	L	II	6.72150E+00	L	III	6.20790E+00
M	I	1.57530E+00	M	II	1.40280E+00	M	III	1.29740E+00	M	IV	9.99500E-01
M	V	9.77700E-00	N	I	3.15200E-00	N	II	2.43300E-00	N	III	2.24600E-01
N	IV	1.17500E-00	N	V	1.17500E-00	O	I	3.00000E-03	O	II	3.75000E-02
O	III	2.11000E-02	N	VI	2.11000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -8.4384E-01, -5.1240E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.3692E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	1.48440E+01	2.7095E-01	7.3944E+03	1.9096E-04	0.000E+00	1.160E+02
1.142761E-02	1.47192E+01	3.0133E-01	7.6926E+03	2.5994E-04	0.000E+00	1.085E+02
1.221612E-02	1.45682E+01	3.3573E-01	8.0178E+03	3.5200E-04	0.000E+00	1.015E+02
1.305903E-02	1.43830E+01	3.7466E-01	8.3698E+03	4.7420E-04	0.000E+00	9.494E+01
1.396010E-02	1.41508E+01	4.1861E-01	8.7480E+03	6.3555E-04	0.000E+00	8.881E+01
1.492335E-02	1.38515E+01	4.6815E-01	9.1520E+03	8.4745E-04	0.000E+00	8.308E+01
1.595306E-02	1.34503E+01	5.2390E-01	9.5806E+03	1.1243E-03	0.000E+00	7.772E+01
1.705382E-02	1.28793E+01	5.8645E-01	1.0032E+04	1.4840E-03	0.000E+00	7.270E+01
1.823053E-02	1.19837E+01	6.5646E-01	1.0505E+04	1.9489E-03	0.000E+00	6.801E+01
1.948844E-02	1.02794E+01	7.3456E-01	1.0996E+04	2.5468E-03	0.000E+00	6.362E+01
2.067800E-02	5.53421E+00	8.1122E-01	1.1445E+04	3.2163E-03	0.000E+00	5.996E+01
2.083314E-02	3.72966E+00	8.2140E-01	1.1502E+04	3.3115E-03	0.000E+00	5.951E+01
2.099450E-02	-9.60247E-02	8.3203E-01	1.1562E+04	3.4125E-03	0.000E+00	5.906E+01
2.107890E-02	-7.02935E+00	8.3761E-01	1.1593E+04	3.4661E-03	0.000E+00	5.882E+01
2.120550E-02	4.43496E-01	1.4593E+01	2.0077E+05	3.5476E-03	0.000E+00	5.847E+01
2.152200E-02	7.05288E+00	1.4087E+01	1.9096E+05	3.7570E-03	0.000E+00	5.761E+01
2.227063E-02	1.21512E+01	1.2999E+01	1.7028E+05	4.2846E-03	0.000E+00	5.567E+01
2.380730E-02	1.62683E+01	1.1145E+01	1.3657E+05	5.5164E-03	0.000E+00	5.208E+01
2.545001E-02	1.82917E+01	9.4814E+00	1.0869E+05	7.0679E-03	0.000E+00	4.872E+01
2.720606E-02	1.93604E+01	8.0415E+00	8.6231E+04	9.0117E-03	0.000E+00	4.557E+01
2.908327E-02	1.98867E+01	6.8589E+00	6.8802E+04	1.1435E-02	0.000E+00	4.263E+01
3.109002E-02	2.00933E+01	5.9286E+00	5.5632E+04	1.4440E-02	0.000E+00	3.988E+01
3.323523E-02	2.01157E+01	5.2254E+00	4.5868E+04	1.8148E-02	0.000E+00	3.731E+01
3.552846E-02	2.00381E+01	4.7161E+00	3.8726E+04	2.2701E-02	0.000E+00	3.490E+01
3.675000E-02	1.99757E+01	4.5213E+00	3.5892E+04	2.5382E-02	0.000E+00	3.374E+01
3.731250E-02	1.99387E+01	4.4460E+00	3.4762E+04	2.6677E-02	0.000E+00	3.323E+01
3.746250E-02	1.99204E+01	4.4273E+00	3.4478E+04	2.7029E-02	0.000E+00	3.310E+01
3.768750E-02	1.99195E+01	4.4216E+00	3.4227E+04	2.7561E-02	0.000E+00	3.290E+01
3.797993E-02	1.99111E+01	4.3890E+00	3.3714E+04	2.8263E-02	0.000E+00	3.264E+01
3.825000E-02	1.99006E+01	4.3607E+00	3.3260E+04	2.8921E-02	0.000E+00	3.241E+01
4.060054E-02	1.97994E+01	4.1768E+00	3.0012E+04	3.5024E-02	0.000E+00	3.054E+01
4.340198E-02	1.96963E+01	4.0705E+00	2.7361E+04	4.3200E-02	0.000E+00	2.857E+01
4.639671E-02	1.96222E+01	4.0486E+00	2.5457E+04	5.3039E-02	0.000E+00	2.672E+01
4.959809E-02	1.95881E+01	4.0943E+00	2.4083E+04	6.4822E-02	0.000E+00	2.500E+01
5.302035E-02	1.96043E+01	4.1942E+00	2.3078E+04	7.8863E-02	0.000E+00	2.338E+01
5.667876E-02	1.96841E+01	4.3227E+00	2.2250E+04	9.5512E-02	0.000E+00	2.187E+01
6.058959E-02	1.97918E+01	4.3219E+00	2.0810E+04	1.1516E-01	0.000E+00	2.046E+01
6.477028E-02	1.99005E+01	4.3249E+00	1.9480E+04	1.3822E-01	0.000E+00	1.914E+01
6.923942E-02	1.99804E+01	4.3260E+00	1.8227E+04	1.6518E-01	0.000E+00	1.791E+01
7.401695E-02	2.00357E+01	4.3208E+00	1.7031E+04	1.9653E-01	0.000E+00	1.675E+01
7.912411E-02	2.00504E+01	4.3063E+00	1.5878E+04	2.3280E-01	0.000E+00	1.567E+01
8.458368E-02	1.99983E+01	4.2801E+00	1.4763E+04	2.7457E-01	0.000E+00	1.466E+01
9.041995E-02	1.98321E+01	4.2412E+00	1.3684E+04	3.2245E-01	0.000E+00	1.371E+01
9.665893E-02	1.94554E+01	4.1888E+00	1.2643E+04	3.7707E-01	0.000E+00	1.283E+01
1.033284E-01	1.86179E+01	4.1227E+00	1.1640E+04	4.3906E-01	0.000E+00	1.200E+01
1.104581E-01	1.63228E+01	4.0431E+00	1.0678E+04	5.0909E-01	0.000E+00	1.122E+01
1.151500E-01	1.08584E+01	3.9868E+00	1.0101E+04	5.5712E-01	0.000E+00	1.077E+01
1.169125E-01	1.31965E+00	3.9651E+00	9.8943E+03	5.7553E-01	0.000E+00	1.060E+01
1.173825E-01	1.19843E+01	3.9593E+00	9.8402E+03	5.8047E-01	0.000E+00	1.056E+01
1.180797E-01	5.11961E+00	3.0904E+01	7.6354E+04	5.8783E-01	0.000E+00	1.050E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 425

Nd Z = 60

Atomic weight = 1.442400E+02 g/mol, nominal density ρ (g/cm³) = 6.9940E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.39516E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.91738E+05

§ edges. Edge energies (keV):

K		4.35689E+00	L	I	7.12600E+00	L	II	6.72150E+00	L	III	6.20790E+00
M	I	1.57530E+00	M	II	1.40280E+00	M	III	1.29740E+00	M	IV	9.99500E-01
M	V	9.77700E-00	N	I	3.15200E-00	N	II	2.43300E-00	N	III	2.24600E-01
N	IV	1.17500E-00	N	V	1.17500E-00	O	I	3.00000E-03	O	II	3.75000E-02
O	III	2.11000E-02	N	VI	2.11000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -8.4384E-01, -5.1240E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.3692E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.48440E+01	2.7095E-01	7.3944E+03	1.9096E-04	0.000E+00	1.160E+02
1.142761E-02	1.47192E+01	3.0133E-01	7.6926E+03	2.5994E-04	0.000E+00	1.085E+02
1.221612E-02	1.45682E+01	3.3573E-01	8.0178E+03	3.5200E-04	0.000E+00	1.015E+02
1.305903E-02	1.43830E+01	3.7466E-01	8.3698E+03	4.7420E-04	0.000E+00	9.494E+01
1.396010E-02	1.41508E+01	4.1861E-01	8.7480E+03	6.3555E-04	0.000E+00	8.881E+01
1.492335E-02	1.38515E+01	4.6815E-01	9.1520E+03	8.4745E-04	0.000E+00	8.308E+01
1.595306E-02	1.34503E+01	5.2390E-01	9.5806E+03	1.1243E-03	0.000E+00	7.772E+01
1.705382E-02	1.28793E+01	5.8645E-01	1.0032E+04	1.4840E-03	0.000E+00	7.270E+01
1.823053E-02	1.19837E+01	6.5646E-01	1.0505E+04	1.9489E-03	0.000E+00	6.801E+01
1.948844E-02	1.02794E+01	7.3456E-01	1.0996E+04	2.5468E-03	0.000E+00	6.362E+01
2.067800E-02	5.53421E+00	8.1122E-01	1.1445E+04	3.2163E-03	0.000E+00	5.996E+01
2.083314E-02	3.72966E+00	8.2140E-01	1.1502E+04	3.3115E-03	0.000E+00	5.951E+01
2.099450E-02	-9.60247E-02	8.3203E-01	1.1562E+04	3.4125E-03	0.000E+00	5.906E+01
2.107890E-02	-7.02935E+00	8.3761E-01	1.1593E+04	3.4661E-03	0.000E+00	5.882E+01
2.120550E-02	4.43496E-01	1.4593E+01	2.0077E+05	3.5476E-03	0.000E+00	5.847E+01
2.152200E-02	7.05288E+00	1.4087E+01	1.9096E+05	3.7570E-03	0.000E+00	5.761E+01
2.227063E-02	1.21512E+01	1.2999E+01	1.7028E+05	4.2846E-03	0.000E+00	5.567E+01
2.380730E-02	1.62683E+01	1.1145E+01	1.3657E+05	5.5164E-03	0.000E+00	5.208E+01
2.545001E-02	1.82917E+01	9.4814E+00	1.0869E+05	7.0679E-03	0.000E+00	4.872E+01
2.720606E-02	1.93604E+01	8.0415E+00	8.6231E+04	9.0117E-03	0.000E+00	4.557E+01
2.908327E-02	1.98867E+01	6.8589E+00	6.8802E+04	1.1435E-02	0.000E+00	4.263E+01
3.109002E-02	2.00933E+01	5.9286E+00	5.5632E+04	1.4440E-02	0.000E+00	3.988E+01
3.323523E-02	2.01157E+01	5.2254E+00	4.5868E+04	1.8148E-02	0.000E+00	3.731E+01
3.552846E-02	2.00381E+01	4.7161E+00	3.8726E+04	2.2701E-02	0.000E+00	3.490E+01
3.675000E-02	1.99757E+01	4.5213E+00	3.5892E+04	2.5382E-02	0.000E+00	3.374E+01
3.731250E-02	1.99387E+01	4.4460E+00	3.4762E+04	2.6677E-02	0.000E+00	3.323E+01
3.746250E-02	1.99204E+01	4.4273E+00	3.4478E+04	2.7029E-02	0.000E+00	3.310E+01
3.768750E-02	1.99195E+01	4.4216E+00	3.4227E+04	2.7561E-02	0.000E+00	3.290E+01
3.797993E-02	1.99111E+01	4.3890E+00	3.3714E+04	2.8263E-02	0.000E+00	3.264E+01
3.825000E-02	1.99006E+01	4.3607E+00	3.3260E+04	2.8921E-02	0.000E+00	3.241E+01
4.060054E-02	1.97994E+01	4.1768E+00	3.0012E+04	3.5024E-02	0.000E+00	3.054E+01
4.340198E-02	1.96963E+01	4.0705E+00	2.7361E+04	4.3200E-02	0.000E+00	2.857E+01
4.639671E-02	1.96222E+01	4.0486E+00	2.5457E+04	5.3039E-02	0.000E+00	2.672E+01
4.959809E-02	1.95881E+01	4.0943E+00	2.4083E+04	6.4822E-02	0.000E+00	2.500E+01
5.302035E-02	1.96043E+01	4.1942E+00	2.3078E+04	7.8863E-02	0.000E+00	2.338E+01
5.667876E-02	1.96841E+01	4.3227E+00	2.2250E+04	9.5512E-02	0.000E+00	2.187E+01
6.058959E-02	1.97918E+01	4.3219E+00	2.0810E+04	1.1516E-01	0.000E+00	2.046E+01
6.477028E-02	1.99005E+01	4.3249E+00	1.9480E+04	1.3822E-01	0.000E+00	1.914E+01
6.923942E-02	1.99804E+01	4.3260E+00	1.8227E+04	1.6518E-01	0.000E+00	1.791E+01
7.401695E-02	2.00357E+01	4.3208E+00	1.7031E+04	1.9653E-01	0.000E+00	1.675E+01
7.912411E-02	2.00504E+01	4.3063E+00	1.5878E+04	2.3280E-01	0.000E+00	1.567E+01
8.458368E-02	1.99983E+01	4.2801E+00	1.4763E+04	2.7457E-01	0.000E+00	1.466E+01
9.041995E-02	1.98321E+01	4.2412E+00	1.3684E+04	3.2245E-01	0.000E+00	1.371E+01
9.665893E-02	1.94554E+01	4.1888E+00	1.2643E+04	3.7707E-01	0.000E+00	1.283E+01
1.033284E-01	1.86179E+01	4.1227E+00	1.1640E+04	4.3906E-01	0.000E+00	1.200E+01
1.104581E-01	1.63228E+01	4.0431E+00	1.0678E+04	5.0909E-01	0.000E+00	1.122E+01
1.151500E-01	1.08584E+01	3.9868E+00	1.0101E+04	5.5712E-01	0.000E+00	1.077E+01
1.169125E-01	1.31965E+00	3.9651E+00	9.8943E+03	5.7553E-01	0.000E+00	1.060E+01
1.173825E-01	1.19843E+01	3.9593E+00	9.8402E+03	5.8047E-01	0.000E+00	1.056E+01
1.180797E-01	5.11961E+00	3.0904E+01	7.6354E+04	5.8783E-01	0.000E+00	1.050E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_k cm ² /g	λ nm
1.180875E-01	5.25916E+00	3.0878E+01	7.6286E+04	5.8791E-01	0.000E+00	1.050E+01
1.198500E-01	1.96923E+01	2.5752E+01	6.2686E+04	6.0665E-01	0.000E+00	1.034E+01
1.262272E-01	2.88455E+01	1.4307E+01	3.3067E+04	6.7594E-01	0.000E+00	9.822E+00
1.349368E-01	2.83898E+01	8.0427E+00	1.7389E+04	7.7405E-01	0.000E+00	9.188E+00
1.442475E-01	2.70569E+01	5.8952E+00	1.1923E+04	8.8278E-01	0.000E+00	8.595E+00
1.542005E-01	2.61421E+01	4.9868E+00	9.4348E+03	1.0027E+00	0.000E+00	8.040E+00
1.648404E-01	2.55119E+01	4.5231E+00	8.0051E+03	1.1343E+00	0.000E+00	7.521E+00
1.762144E-01	2.50299E+01	4.2565E+00	7.0470E+03	1.2781E+00	0.000E+00	7.036E+00
1.883732E-01	2.46076E+01	4.0991E+00	6.3484E+03	1.4344E+00	0.000E+00	6.582E+00
2.013709E-01	2.41738E+01	4.0177E+00	5.8207E+03	1.6035E+00	0.000E+00	6.157E+00
2.152655E-01	2.35954E+01	4.0005E+00	5.4216E+03	1.7855E+00	0.000E+00	5.760E+00
2.201080E-01	2.32599E+01	4.0083E+00	5.3128E+03	1.8491E+00	0.000E+00	5.633E+00
2.234770E-01	2.27420E+01	4.0175E+00	5.2447E+03	1.8934E+00	0.000E+00	5.548E+00
2.243754E-01	2.22063E+01	4.0205E+00	5.2275E+03	1.9052E+00	0.000E+00	5.526E+00
2.257230E-01	2.26865E+01	5.0321E+00	6.5038E+03	1.9229E+00	0.000E+00	5.493E+00
2.290920E-01	2.30505E+01	5.0579E+00	6.4410E+03	1.9671E+00	0.000E+00	5.412E+00
2.301188E-01	2.30922E+01	5.0663E+00	6.4229E+03	1.9805E+00	0.000E+00	5.388E+00
2.384340E-01	2.31601E+01	5.1428E+00	6.2926E+03	2.0895E+00	0.000E+00	5.200E+00
2.420835E-01	2.30404E+01	5.1810E+00	6.2437E+03	2.1373E+00	0.000E+00	5.122E+00
2.430567E-01	2.28763E+01	5.1916E+00	6.2314E+03	2.1500E+00	0.000E+00	5.101E+00
2.445165E-01	2.30485E+01	5.5371E+00	6.6065E+03	2.1691E+00	0.000E+00	5.071E+00
2.459970E-01	2.31354E+01	5.5559E+00	6.5889E+03	2.1884E+00	0.000E+00	5.040E+00
2.481660E-01	2.32014E+01	5.5840E+00	6.5644E+03	2.2167E+00	0.000E+00	4.996E+00
2.629708E-01	2.33495E+01	5.7938E+00	6.4276E+03	2.4089E+00	0.000E+00	4.715E+00
2.811158E-01	2.33965E+01	6.0823E+00	6.3121E+03	2.6415E+00	0.000E+00	4.410E+00
3.005128E-01	2.33813E+01	6.4105E+00	6.2233E+03	2.8858E+00	0.000E+00	4.126E+00
3.088960E-01	2.33017E+01	6.5538E+00	6.1898E+03	2.9898E+00	0.000E+00	4.014E+00
3.136240E-01	2.31078E+01	6.6343E+00	6.1713E+03	3.0479E+00	0.000E+00	3.953E+00
3.148848E-01	2.28508E+01	6.6556E+00	6.1664E+03	3.0634E+00	0.000E+00	3.937E+00
3.167760E-01	2.31314E+01	7.2086E+00	6.6388E+03	3.0865E+00	0.000E+00	3.914E+00
3.212482E-01	2.33907E+01	7.2869E+00	6.6175E+03	3.1410E+00	0.000E+00	3.859E+00
3.215040E-01	2.33998E+01	7.2913E+00	6.6163E+03	3.1441E+00	0.000E+00	3.856E+00
3.434143E-01	2.38604E+01	7.6594E+00	6.5068E+03	3.4061E+00	0.000E+00	3.610E+00
3.671099E-01	2.42347E+01	8.0150E+00	6.3694E+03	3.6801E+00	0.000E+00	3.377E+00
3.924405E-01	2.46214E+01	8.3308E+00	6.1931E+03	3.9617E+00	0.000E+00	3.159E+00
4.195189E-01	2.50200E+01	8.5880E+00	5.9722E+03	4.2495E+00	0.000E+00	2.955E+00
4.484657E-01	2.54131E+01	8.7743E+00	5.7079E+03	4.5421E+00	0.000E+00	2.765E+00
4.794098E-01	2.57761E+01	8.8816E+00	5.4048E+03	4.8376E+00	0.000E+00	2.586E+00
5.124891E-01	2.60742E+01	8.8978E+00	5.0651E+03	5.1343E+00	0.000E+00	2.419E+00
5.478508E-01	2.62611E+01	8.8269E+00	4.7005E+03	5.4302E+00	0.000E+00	2.263E+00
5.856525E-01	2.62884E+01	8.6816E+00	4.3247E+03	5.7235E+00	0.000E+00	2.117E+00
6.260625E-01	2.60990E+01	8.4761E+00	3.9498E+03	6.0121E+00	0.000E+00	1.980E+00
6.692609E-01	2.56151E+01	8.2249E+00	3.5853E+03	6.2938E+00	0.000E+00	1.853E+00
7.154399E-01	2.47143E+01	7.9413E+00	3.2383E+03	6.5667E+00	0.000E+00	1.733E+00
7.648052E-01	2.31786E+01	7.6364E+00	2.9129E+03	6.8288E+00	0.000E+00	1.621E+00
8.175768E-01	2.05409E+01	7.3201E+00	2.6121E+03	7.0779E+00	0.000E+00	1.516E+00
8.739896E-01	1.55892E+01	7.0000E+00	2.3366E+03	7.3123E+00	0.000E+00	1.419E+00
9.342948E-01	3.38758E+00	6.6813E+00	2.0863E+03	7.5301E+00	0.000E+00	1.327E+00
9.581460E-01	-8.54153E+00	6.5622E+00	1.9981E+03	7.6077E+00	0.000E+00	1.294E+00
9.728115E-01	-2.57248E+01	6.4909E+00	1.9466E+03	7.6532E+00	0.000E+00	1.274E+00
9.767223E-01	-3.93461E+01	6.4722E+00	1.9332E+03	7.6650E+00	0.000E+00	1.269E+00
9.795100E-01	-3.84628E+01	2.6214E+01	7.8077E+03	7.6734E+00	0.000E+00	1.266E+00
9.825885E-01	-3.63562E+01	2.6089E+01	7.7460E+03	7.6826E+00	0.000E+00	1.262E+00
9.945025E-01	-6.63744E+01	2.5614E+01	7.5138E+03	7.7174E+00	0.000E+00	1.247E+00
9.972540E-01	-9.58005E+01	2.5506E+01	7.4615E+03	7.7253E+00	0.000E+00	1.243E+00
9.987612E-01	-1.42632E+02	2.5447E+01	7.4331E+03	7.7296E+00	0.000E+00	1.241E+00
1.004497E+00	-3.26744E+01	1.5528E+02	4.5097E+04	7.7458E+00	0.000E+00	1.234E+00
1.019490E+00	3.93357E+01	1.1181E+02	3.1995E+04	7.7871E+00	0.000E+00	1.216E+00
1.067676E+00	6.15155E+01	4.7969E+01	1.3107E+04	7.9093E+00	0.000E+00	1.161E+00
1.141345E+00	5.02612E+01	2.8104E+01	7.1835E+03	8.0679E+00	0.000E+00	1.086E+00
1.220098E+00	4.62002E+01	2.3403E+01	5.5958E+03	8.2042E+00	0.000E+00	1.016E+00
1.271452E+00	4.36441E+01	2.1842E+01	5.0116E+03	8.2768E+00	0.000E+00	9.751E-01
1.290913E+00	4.15223E+01	2.1423E+01	4.8414E+03	8.3012E+00	0.000E+00	9.604E-01
1.296103E+00	3.92314E+01	2.1318E+01	4.7984E+03	8.3075E+00	0.000E+00	9.566E-01
1.304285E+00	4.15002E+01	2.5540E+01	5.7128E+03	8.3171E+00	0.000E+00	9.506E-01

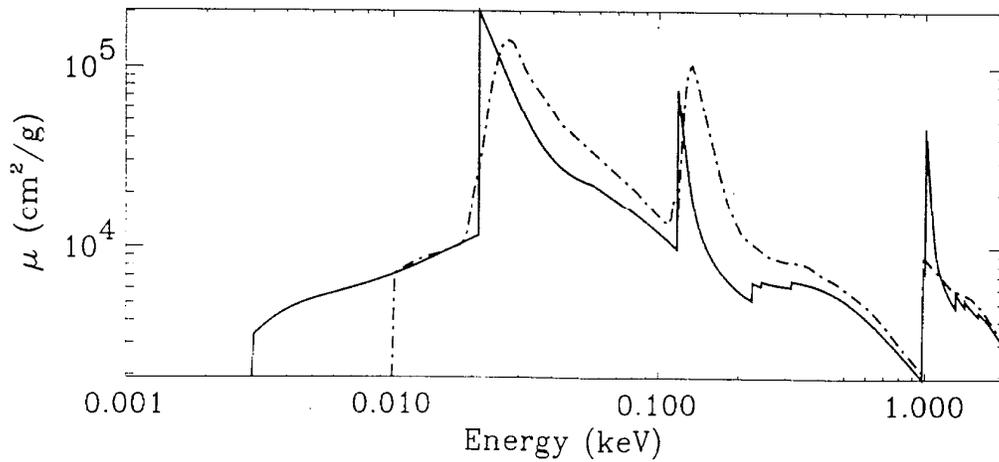
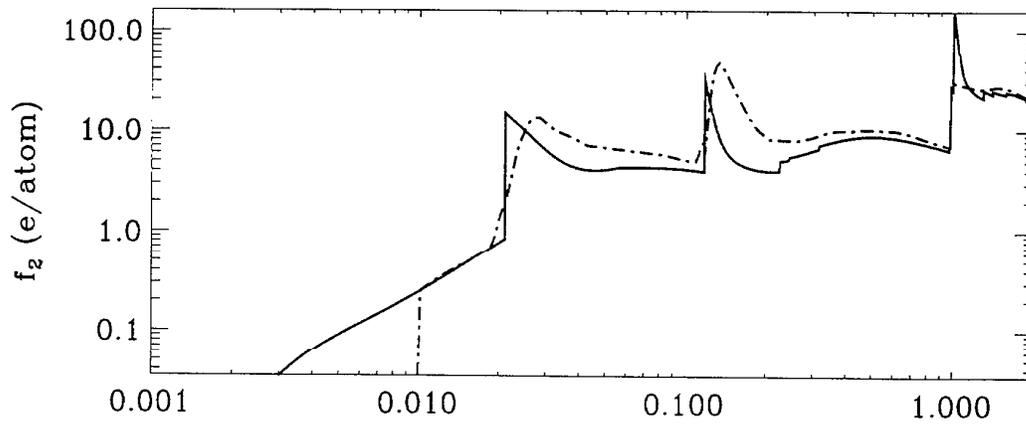
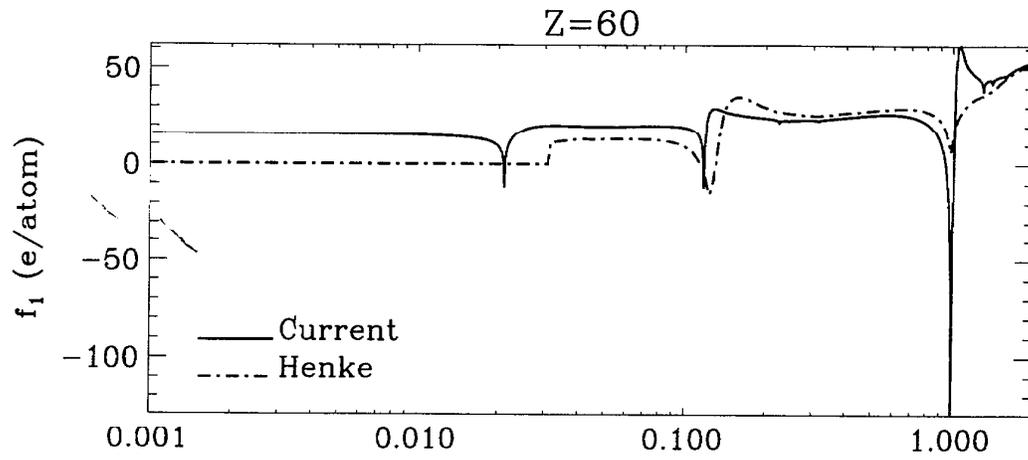
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 427

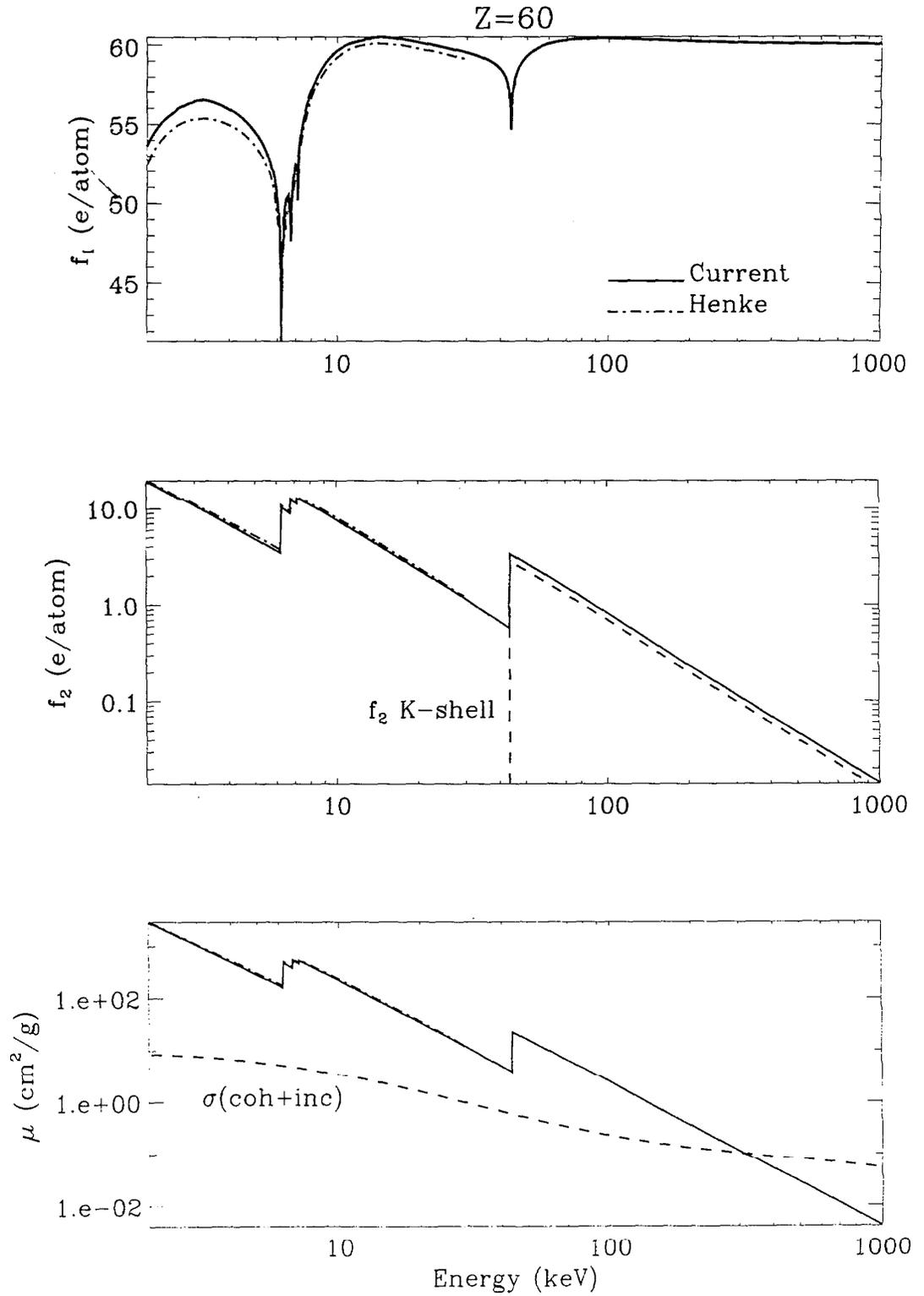
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e ⁻ /atom	f ₂ e ⁻ /atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.323348E+00	4.32461E+01	2.5034E+01	5.5189E+03	8.3385E+00	0.000E+00	9.369E-01
1.374744E+00	4.40531E+01	2.3896E+01	5.0711E+03	8.3893E+00	0.000E+00	9.019E-01
1.394281E+00	4.36492E+01	2.3578E+01	4.9334E+03	8.4060E+00	0.000E+00	8.892E-01
1.395786E+00	4.35570E+01	2.3555E+01	4.9233E+03	8.4073E+00	0.000E+00	8.883E-01
1.401397E+00	4.26964E+01	2.3470E+01	4.8860E+03	8.4118E+00	0.000E+00	8.847E-01
1.409814E+00	4.37296E+01	2.5170E+01	5.2085E+03	8.4184E+00	0.000E+00	8.794E-01
1.430856E+00	4.47830E+01	2.4829E+01	5.0624E+03	8.4340E+00	0.000E+00	8.665E-01
1.490486E+00	4.59104E+01	2.4050E+01	4.7074E+03	8.4704E+00	0.000E+00	8.318E-01
1.543794E+00	4.64029E+01	2.3566E+01	4.4535E+03	8.4943E+00	0.000E+00	8.031E-01
1.567423E+00	4.62583E+01	2.3389E+01	4.3533E+03	8.5025E+00	0.000E+00	7.910E-01
1.573725E+00	4.57586E+01	2.3345E+01	4.3277E+03	8.5044E+00	0.000E+00	7.878E-01
1.583176E+00	4.65031E+01	2.4450E+01	4.5055E+03	8.5071E+00	0.000E+00	7.831E-01
1.593329E+00	4.69769E+01	2.4378E+01	4.4637E+03	8.5098E+00	0.000E+00	7.781E-01
1.606806E+00	4.74058E+01	2.4287E+01	4.4097E+03	8.5130E+00	0.000E+00	7.716E-01
1.703269E+00	4.97003E+01	2.3551E+01	4.0338E+03	8.5243E+00	0.000E+00	7.279E-01
1.820795E+00	5.16993E+01	2.1859E+01	3.5024E+03	8.5140E+00	0.000E+00	6.809E-01
1.946430E+00	5.31533E+01	2.0106E+01	3.0136E+03	8.4792E+00	0.000E+00	6.370E-01
2.080733E+00	5.42178E+01	1.8387E+01	2.5780E+03	8.4205E+00	0.000E+00	5.959E-01
2.224304E+00	5.49753E+01	1.6744E+01	2.1961E+03	8.3387E+00	0.000E+00	5.574E-01
2.377781E+00	5.54880E+01	1.5202E+01	1.8652E+03	8.2347E+00	0.000E+00	5.214E-01
2.541848E+00	5.58218E+01	1.3815E+01	1.5856E+03	8.1097E+00	0.000E+00	4.878E-01
2.717235E+00	5.61458E+01	1.2562E+01	1.3488E+03	7.9648E+00	0.000E+00	4.563E-01
2.904724E+00	5.63486E+01	1.1437E+01	1.1486E+03	7.8016E+00	0.000E+00	4.268E-01
3.105150E+00	5.65072E+01	1.0350E+01	9.7243E+02	7.6215E+00	0.000E+00	3.993E-01
3.319406E+00	5.64758E+01	9.3078E+00	8.1805E+02	7.4260E+00	0.000E+00	3.735E-01
3.548445E+00	5.63386E+01	8.3805E+00	6.8901E+02	7.2168E+00	0.000E+00	3.494E-01
3.793288E+00	5.61380E+01	7.5560E+00	5.8112E+02	6.9957E+00	0.000E+00	3.269E-01
4.055024E+00	5.58798E+01	6.8021E+00	4.8938E+02	6.7643E+00	0.000E+00	3.058E-01
4.334821E+00	5.55364E+01	6.1071E+00	4.1102E+02	6.5244E+00	0.000E+00	2.860E-01
4.633924E+00	5.50956E+01	5.4906E+00	3.4567E+02	6.2776E+00	0.000E+00	2.676E-01
4.953664E+00	5.45257E+01	4.9438E+00	2.9116E+02	6.0255E+00	0.000E+00	2.503E-01
5.295467E+00	5.37453E+01	4.4599E+00	2.4570E+02	5.7700E+00	0.000E+00	2.341E-01
5.660855E+00	5.25236E+01	4.0284E+00	2.0761E+02	5.5123E+00	0.000E+00	2.190E-01
6.051453E+00	4.96236E+01	3.6265E+00	1.7483E+02	5.2541E+00	0.000E+00	2.049E-01
6.083742E+00	4.90992E+01	3.5963E+00	1.7246E+02	5.2336E+00	0.000E+00	2.038E-01
6.176861E+00	4.59862E+01	3.5094E+00	1.6575E+02	5.1749E+00	0.000E+00	2.007E-01
6.201692E+00	4.23756E+01	3.4869E+00	1.6403E+02	5.1594E+00	0.000E+00	1.999E-01
6.238940E+00	4.59501E+01	1.0477E+01	4.8989E+02	5.1363E+00	0.000E+00	1.987E-01
6.332058E+00	4.90157E+01	1.0157E+01	4.6796E+02	5.0791E+00	0.000E+00	1.958E-01
6.469004E+00	5.03230E+01	9.7134E+00	4.3805E+02	4.9967E+00	0.000E+00	1.917E-01
6.587070E+00	5.04754E+01	9.3795E+00	4.1541E+02	4.9273E+00	0.000E+00	1.882E-01
6.687892E+00	4.94518E+01	9.1261E+00	3.9810E+02	4.8691E+00	0.000E+00	1.854E-01
6.714778E+00	4.77614E+01	9.0613E+00	3.9369E+02	4.8537E+00	0.000E+00	1.846E-01
6.755107E+00	4.97211E+01	1.2490E+01	5.3941E+02	4.8309E+00	0.000E+00	1.835E-01
6.855930E+00	5.16041E+01	1.2143E+01	5.1672E+02	4.7743E+00	0.000E+00	1.808E-01
6.915365E+00	5.21180E+01	1.1947E+01	5.0399E+02	4.7415E+00	0.000E+00	1.793E-01
6.983480E+00	5.24797E+01	1.1729E+01	4.8998E+02	4.7042E+00	0.000E+00	1.775E-01
7.090370E+00	5.24047E+01	1.1409E+01	4.6942E+02	4.6466E+00	0.000E+00	1.749E-01
7.118874E+00	5.16595E+01	1.1330E+01	4.6431E+02	4.6315E+00	0.000E+00	1.742E-01
7.161630E+00	5.27687E+01	1.2981E+01	5.2880E+02	4.6088E+00	0.000E+00	1.731E-01
7.268520E+00	5.40478E+01	1.2689E+01	5.0929E+02	4.5530E+00	0.000E+00	1.706E-01
7.392525E+00	5.48829E+01	1.2368E+01	4.8810E+02	4.4895E+00	0.000E+00	1.677E-01
7.902609E+00	5.68673E+01	1.1191E+01	4.1314E+02	4.2418E+00	0.000E+00	1.569E-01
8.447890E+00	5.80697E+01	1.0105E+01	3.4897E+02	3.9995E+00	0.000E+00	1.468E-01
9.030794E+00	5.88974E+01	9.0889E+00	2.9361E+02	3.7634E+00	0.000E+00	1.373E-01
9.653919E+00	5.94525E+01	8.1175E+00	2.4531E+02	3.5342E+00	0.000E+00	1.284E-01
1.032004E+01	5.98121E+01	7.2528E+00	2.0503E+02	3.3125E+00	0.000E+00	1.201E-01
1.103212E+01	6.00465E+01	6.4859E+00	1.7151E+02	3.0989E+00	0.000E+00	1.124E-01
1.179334E+01	6.01960E+01	5.8052E+00	1.4361E+02	2.8938E+00	0.000E+00	1.051E-01
1.260708E+01	6.03595E+01	5.1951E+00	1.2022E+02	2.6975E+00	0.000E+00	9.834E-02
1.347697E+01	6.04387E+01	4.6369E+00	1.0038E+02	2.5103E+00	0.000E+00	9.200E-02
1.440688E+01	6.04740E+01	4.1298E+00	8.3627E+01	2.3322E+00	0.000E+00	8.606E-02
1.540095E+01	6.04403E+01	3.6706E+00	6.9532E+01	2.1634E+00	0.000E+00	8.050E-02
1.646362E+01	6.03808E+01	3.2654E+00	5.7863E+01	2.0038E+00	0.000E+00	7.531E-02
1.759961E+01	6.03052E+01	2.9074E+00	4.8194E+01	1.8534E+00	0.000E+00	7.045E-02

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.881398E+01	6.02192E+01	2.5908E+00	4.0174E+01	1.7121E+00	0.000E+00	6.590E-02
2.011215E+01	6.01261E+01	2.3103E+00	3.3513E+01	1.5795E+00	0.000E+00	6.165E-02
2.149988E+01	6.00284E+01	2.0622E+00	2.7982E+01	1.4556E+00	0.000E+00	5.767E-02
2.298338E+01	5.99273E+01	1.8424E+00	2.3386E+01	1.3401E+00	0.000E+00	5.395E-02
2.456923E+01	5.98234E+01	1.6476E+00	1.9563E+01	1.2326E+00	0.000E+00	5.046E-02
2.626450E+01	5.97171E+01	1.4747E+00	1.6381E+01	1.1328E+00	0.000E+00	4.721E-02
2.807676E+01	5.96126E+01	1.3090E+00	1.3601E+01	1.0404E+00	0.000E+00	4.416E-02
3.001405E+01	5.94862E+01	1.1578E+00	1.1254E+01	9.5512E-01	0.000E+00	4.131E-02
3.208502E+01	5.93390E+01	1.0217E+00	9.2900E+00	8.7646E-01	0.000E+00	3.864E-02
3.429889E+01	5.91595E+01	9.0046E-01	7.6591E+00	8.0411E-01	0.000E+00	3.615E-02
3.666551E+01	5.89249E+01	7.9380E-01	6.3161E+00	7.3770E-01	0.000E+00	3.381E-02
3.919543E+01	5.85720E+01	7.0034E-01	5.2127E+00	6.7685E-01	0.000E+00	3.163E-02
4.189992E+01	5.78130E+01	6.1837E-01	4.3056E+00	6.2120E-01	0.000E+00	2.959E-02
4.269752E+01	5.72777E+01	5.9708E-01	4.0797E+00	6.0637E-01	0.000E+00	2.904E-02
4.335106E+01	5.60865E+01	5.8049E-01	3.9065E+00	5.9470E-01	0.000E+00	2.860E-02
4.352533E+01	5.46590E+01	5.7619E-01	3.8620E+00	5.9166E-01	0.000E+00	2.849E-02
4.378675E+01	5.61019E+01	3.3802E+00	2.2521E+01	5.8715E-01	1.872E+01	2.832E-02
4.444028E+01	5.74061E+01	3.3033E+00	2.1685E+01	5.7616E-01	1.805E+01	2.790E-02
4.479101E+01	5.77322E+01	3.2633E+00	2.1255E+01	5.7041E-01	1.770E+01	2.768E-02
4.788159E+01	5.89643E+01	2.9336E+00	1.7874E+01	5.2412E-01	1.493E+01	2.589E-02
5.118542E+01	5.94877E+01	2.6295E+00	1.4987E+01	4.8201E-01	1.255E+01	2.422E-02
5.471721E+01	5.97971E+01	2.3545E+00	1.2554E+01	4.4375E-01	1.053E+01	2.266E-02
5.849270E+01	5.99994E+01	2.1055E+00	1.0501E+01	4.0903E-01	8.827E+00	2.120E-02
6.252870E+01	6.01336E+01	1.8805E+00	8.7740E+00	3.7758E-01	7.385E+00	1.983E-02
6.684318E+01	6.02238E+01	1.6795E+00	7.3302E+00	3.4911E-01	6.176E+00	1.855E-02
7.145536E+01	6.02840E+01	1.4999E+00	6.1236E+00	3.2336E-01	5.165E+00	1.735E-02
7.638578E+01	6.03235E+01	1.3393E+00	5.1153E+00	3.0009E-01	4.318E+00	1.623E-02
8.165640E+01	6.03490E+01	1.1944E+00	4.2671E+00	2.7907E-01	3.606E+00	1.518E-02
8.729069E+01	6.03916E+01	1.0619E+00	3.5491E+00	2.6009E-01	3.004E+00	1.420E-02
9.331374E+01	6.03920E+01	9.4080E-01	2.9413E+00	2.4296E-01	2.492E+00	1.329E-02
9.975239E+01	6.03843E+01	8.3358E-01	2.4379E+00	2.2749E-01	2.067E+00	1.243E-02
1.066353E+02	6.03715E+01	7.3864E-01	2.0208E+00	2.1351E-01	1.714E+00	1.163E-02
1.139931E+02	6.03552E+01	6.5458E-01	1.6752E+00	2.0088E-01	1.422E+00	1.088E-02
1.218587E+02	6.03369E+01	5.8013E-01	1.3889E+00	1.8944E-01	1.180E+00	1.017E-02
1.302669E+02	6.03175E+01	5.1419E-01	1.1515E+00	1.7907E-01	9.784E-01	9.518E-03
1.392553E+02	6.02975E+01	4.5578E-01	9.5486E-01	1.6966E-01	8.116E-01	8.903E-03
1.488640E+02	6.02775E+01	4.0404E-01	7.9183E-01	1.6110E-01	6.732E-01	8.329E-03
1.591356E+02	6.02577E+01	3.5820E-01	6.5668E-01	1.5328E-01	5.584E-01	7.791E-03
1.701159E+02	6.02386E+01	3.1759E-01	5.4464E-01	1.4613E-01	4.632E-01	7.288E-03
1.818539E+02	6.02201E+01	2.8159E-01	4.5175E-01	1.3957E-01	3.842E-01	6.818E-03
1.944018E+02	6.02023E+01	2.4998E-01	3.7514E-01	1.3353E-01	3.191E-01	6.378E-03
2.078156E+02	6.01858E+01	2.2225E-01	3.1200E-01	1.2794E-01	2.655E-01	5.966E-03
2.221548E+02	6.01704E+01	1.9761E-01	2.5950E-01	1.2275E-01	2.209E-01	5.581E-03
2.374835E+02	6.01561E+01	1.7571E-01	2.1585E-01	1.1791E-01	1.838E-01	5.221E-03
2.538699E+02	6.01428E+01	1.5625E-01	1.7955E-01	1.1337E-01	1.529E-01	4.884E-03
2.713869E+02	6.01305E+01	1.3895E-01	1.4937E-01	1.0911E-01	1.272E-01	4.569E-03
2.901126E+02	6.01191E+01	1.2357E-01	1.2426E-01	1.0508E-01	1.058E-01	4.274E-03
3.101304E+02	6.01086E+01	1.0990E-01	1.0339E-01	1.0126E-01	8.804E-02	3.998E-03
3.315294E+02	6.00989E+01	9.7751E-02	8.6019E-02	9.7616E-02	7.325E-02	3.740E-03
3.544049E+02	6.00900E+01	8.6948E-02	7.1574E-02	9.4134E-02	6.094E-02	3.498E-03
3.788588E+02	6.00818E+01	7.7342E-02	5.9557E-02	9.0793E-02	5.070E-02	3.273E-03
4.050001E+02	6.00743E+01	6.8801E-02	4.9561E-02	8.7576E-02	4.218E-02	3.061E-03
4.329451E+02	6.00674E+01	6.1207E-02	4.1244E-02	8.4469E-02	3.509E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 431

Pm Z = 61

Atomic weight = 1.450000E+02 g/mol, nominal density ρ (g/cm³) = 7.2000E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.40778E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.90209E+05

18 edges. Edge energies (keV):

K		4.51840E+00	L	I	7.42790E+00	L	II	7.01280E+00	L	III	6.45930E+00
M	I	1.64650E+00	M	II	1.47140E+00	M	III	1.35690E+00	M	IV	1.05150E+00
M	V	1.02690E+00	N	I	3.30400E-00	N	II	2.54400E-00	N	III	2.36000E-01
N	IV	1.20400E-00	N	V	1.20400E-00	O	I	4.00000E-03	O	II	3.75000E-02
O	III	2.11000E-02	N	VI	2.11000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -8.8035E-01, -5.3340E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.4078E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	1.25974E+01	2.4241E-01	6.5808E+03	2.0774E-04	0.000E+00	1.160E+02
1.142761E-02	1.24613E+01	2.7242E-01	6.9181E+03	2.8236E-04	0.000E+00	1.085E+02
1.221612E-02	1.23126E+01	3.0634E-01	7.2775E+03	3.8179E-04	0.000E+00	1.015E+02
1.305903E-02	1.21106E+01	3.4476E-01	7.6616E+03	5.1358E-04	0.000E+00	9.494E+01
1.396010E-02	1.18573E+01	3.8832E-01	8.0726E+03	6.8733E-04	0.000E+00	8.881E+01
1.492335E-02	1.15312E+01	4.3773E-01	8.5124E+03	9.1519E-04	0.000E+00	8.308E+01
1.595306E-02	1.10943E+01	4.9378E-01	8.9826E+03	1.2124E-03	0.000E+00	7.772E+01
1.705382E-02	1.04739E+01	5.5717E-01	9.4814E+03	1.5981E-03	0.000E+00	7.270E+01
1.823053E-02	9.50254E+00	6.2855E-01	1.0006E+04	2.0960E-03	0.000E+00	6.801E+01
1.948844E-02	7.65798E+00	7.0875E-01	1.0554E+04	2.7353E-03	0.000E+00	6.362E+01
2.067800E-02	2.52909E+00	7.8801E-01	1.1060E+04	3.4505E-03	0.000E+00	5.996E+01
2.083314E-02	5.78709E-01	7.9858E-01	1.1124E+04	3.5521E-03	0.000E+00	5.951E+01
2.099450E-02	-3.55699E+00	8.0963E-01	1.1192E+04	3.6599E-03	0.000E+00	5.906E+01
2.107890E-02	-1.10546E+01	8.1543E-01	1.1227E+04	3.7171E-03	0.000E+00	5.882E+01
2.120550E-02	-2.96724E+00	1.5691E+01	2.1475E+05	3.8041E-03	0.000E+00	5.847E+01
2.152200E-02	4.18486E+00	1.5134E+01	2.0407E+05	4.0274E-03	0.000E+00	5.761E+01
2.227063E-02	9.69595E+00	1.3936E+01	1.8160E+05	4.5900E-03	0.000E+00	5.567E+01
2.380730E-02	1.41247E+01	1.1898E+01	1.4504E+05	5.9023E-03	0.000E+00	5.208E+01
2.545001E-02	1.62788E+01	1.0082E+01	1.1496E+05	7.5529E-03	0.000E+00	4.872E+01
2.720606E-02	1.73987E+01	8.5183E+00	9.0865E+04	9.6186E-03	0.000E+00	4.557E+01
2.908327E-02	1.79337E+01	7.2406E+00	7.2251E+04	1.2191E-02	0.000E+00	4.263E+01
3.109002E-02	1.81250E+01	6.2405E+00	5.8252E+04	1.5377E-02	0.000E+00	3.988E+01
3.323523E-02	1.81188E+01	5.4887E+00	4.7927E+04	1.9304E-02	0.000E+00	3.731E+01
3.552846E-02	1.80053E+01	4.9481E+00	4.0418E+04	2.4120E-02	0.000E+00	3.490E+01
3.675000E-02	1.79230E+01	4.7430E+00	3.7455E+04	2.6954E-02	0.000E+00	3.374E+01
3.731250E-02	1.78768E+01	4.6642E+00	3.6277E+04	2.8322E-02	0.000E+00	3.323E+01
3.746250E-02	1.78559E+01	4.6447E+00	3.5981E+04	2.8693E-02	0.000E+00	3.310E+01
3.768750E-02	1.78515E+01	4.6381E+00	3.5715E+04	2.9256E-02	0.000E+00	3.290E+01
3.797993E-02	1.78383E+01	4.6041E+00	3.5180E+04	2.9998E-02	0.000E+00	3.264E+01
3.825000E-02	1.78235E+01	4.5747E+00	3.4709E+04	3.0692E-02	0.000E+00	3.241E+01
4.060054E-02	1.76842E+01	4.3856E+00	3.1348E+04	3.7134E-02	0.000E+00	3.054E+01
4.340198E-02	1.75358E+01	4.2820E+00	2.8632E+04	4.5756E-02	0.000E+00	2.857E+01
4.639671E-02	1.74120E+01	4.2700E+00	2.6709E+04	5.6122E-02	0.000E+00	2.672E+01
4.959809E-02	1.73214E+01	4.3313E+00	2.5343E+04	6.8523E-02	0.000E+00	2.500E+01
5.302035E-02	1.72687E+01	4.4514E+00	2.4365E+04	8.3286E-02	0.000E+00	2.338E+01
5.667875E-02	1.72569E+01	4.6186E+00	2.3648E+04	1.0078E-01	0.000E+00	2.187E+01
5.058959E-02	1.72887E+01	4.8239E+00	2.3105E+04	1.2139E-01	0.000E+00	2.046E+01
6.477028E-02	1.73807E+01	5.0598E+00	2.2671E+04	1.4558E-01	0.000E+00	1.914E+01
6.923942E-02	1.75100E+01	5.3207E+00	2.2301E+04	1.7383E-01	0.000E+00	1.791E+01
7.401695E-02	1.75990E+01	5.6013E+00	2.1962E+04	2.0664E-01	0.000E+00	1.675E+01
7.912411E-02	1.79251E+01	5.6952E+00	2.0889E+04	2.4458E-01	0.000E+00	1.567E+01
8.458368E-02	1.80861E+01	5.7150E+00	1.9608E+04	2.8825E-01	0.000E+00	1.466E+01
9.041995E-02	1.81521E+01	5.7131E+00	1.8337E+04	3.3825E-01	0.000E+00	1.371E+01
9.665893E-02	1.80626E+01	5.6880E+00	1.7078E+04	3.9525E-01	0.000E+00	1.283E+01
1.033284E-01	1.76679E+01	5.6391E+00	1.5838E+04	4.5990E-01	0.000E+00	1.200E+01
1.104581E-01	1.64768E+01	5.5664E+00	1.4625E+04	5.3289E-01	0.000E+00	1.122E+01
1.180797E-01	1.05893E+01	5.4707E+00	1.3446E+04	6.1490E-01	0.000E+00	1.050E+01
1.197980E-01	2.48370E+00	5.4470E+00	1.3195E+04	6.3391E-01	0.000E+00	1.035E+01
1.202796E-01	-9.07462E+00	5.4403E+00	1.3126E+04	6.3927E-01	0.000E+00	1.031E+01
1.210020E-01	5.83007E+00	2.8833E+01	6.9153E+04	6.4734E-01	0.000E+00	1.025E+01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.228080E-01	1.83831E+01	2.4522E+01	5.7949E+04	6.6764E-01	0.000E+00	1.010E+01
1.262272E-01	2.49094E+01	1.8495E+01	4.2523E+04	7.0660E-01	0.000E+00	9.822E+00
1.349368E-01	2.69129E+01	1.0559E+01	2.2710E+04	8.0865E-01	0.000E+00	9.188E+00
1.442475E-01	2.58805E+01	7.7222E+00	1.5536E+04	9.2168E-01	0.000E+00	8.595E+00
1.542005E-01	2.50823E+01	6.5612E+00	1.2348E+04	1.0463E+00	0.000E+00	8.040E+00
1.648404E-01	2.45573E+01	5.9659E+00	1.0503E+04	1.1830E+00	0.000E+00	7.521E+00
1.762144E-01	2.41830E+01	5.6058E+00	9.2322E+03	1.3322E+00	0.000E+00	7.036E+00
1.883732E-01	2.38736E+01	5.3667E+00	8.2681E+03	1.4943E+00	0.000E+00	6.582E+00
2.013709E-01	2.35691E+01	5.2069E+00	7.5040E+03	1.6696E+00	0.000E+00	6.157E+00
2.152655E-01	2.32062E+01	5.1113E+00	6.8907E+03	1.8583E+00	0.000E+00	5.760E+00
2.301188E-01	2.25768E+01	5.0760E+00	6.4015E+03	2.0602E+00	0.000E+00	5.388E+00
2.312800E-01	2.24862E+01	5.0758E+00	6.3691E+03	2.0760E+00	0.000E+00	5.361E+00
2.348200E-01	2.19714E+01	5.0772E+00	6.2748E+03	2.1241E+00	0.000E+00	5.280E+00
2.357640E-01	2.14258E+01	5.0780E+00	6.2507E+03	2.1369E+00	0.000E+00	5.259E+00
2.371800E-01	2.19251E+01	6.1132E+00	7.4800E+03	2.1561E+00	0.000E+00	5.227E+00
2.407200E-01	2.23136E+01	6.1316E+00	7.3922E+03	2.2041E+00	0.000E+00	5.151E+00
2.459970E-01	2.24530E+01	6.1641E+00	7.2719E+03	2.2755E+00	0.000E+00	5.040E+00
2.493120E-01	2.24616E+01	6.1874E+00	7.2024E+03	2.3202E+00	0.000E+00	4.973E+00
2.531280E-01	2.23623E+01	6.2170E+00	7.1277E+03	2.3716E+00	0.000E+00	4.898E+00
2.541456E-01	2.22022E+01	6.2253E+00	7.1087E+03	2.3853E+00	0.000E+00	4.878E+00
2.556720E-01	2.23830E+01	6.5697E+00	7.4571E+03	2.4058E+00	0.000E+00	4.849E+00
2.594880E-01	2.25540E+01	6.6082E+00	7.3906E+03	2.4570E+00	0.000E+00	4.778E+00
2.629708E-01	2.26273E+01	6.6454E+00	7.3337E+03	2.5036E+00	0.000E+00	4.715E+00
2.811158E-01	2.28052E+01	6.8629E+00	7.0849E+03	2.7443E+00	0.000E+00	4.410E+00
3.005128E-01	2.28942E+01	7.1258E+00	6.8814E+03	2.9969E+00	0.000E+00	4.126E+00
3.212482E-01	2.28837E+01	7.4199E+00	6.7030E+03	3.2607E+00	0.000E+00	3.859E+00
3.237920E-01	2.28535E+01	7.4560E+00	6.6826E+03	3.2926E+00	0.000E+00	3.829E+00
3.287480E-01	2.26699E+01	7.5258E+00	6.6435E+03	3.3543E+00	0.000E+00	3.771E+00
3.300696E-01	2.24146E+01	7.5443E+00	6.6332E+03	3.3707E+00	0.000E+00	3.756E+00
3.320520E-01	2.27008E+01	8.0953E+00	7.0752E+03	3.3953E+00	0.000E+00	3.734E+00
3.370080E-01	2.29808E+01	8.1672E+00	7.0331E+03	3.4564E+00	0.000E+00	3.679E+00
3.434143E-01	2.31609E+01	8.2586E+00	6.9791E+03	3.5346E+00	0.000E+00	3.610E+00
3.671099E-01	2.36093E+01	8.5749E+00	6.7787E+03	3.8177E+00	0.000E+00	3.377E+00
3.924405E-01	2.40174E+01	8.8619E+00	6.5534E+03	4.1085E+00	0.000E+00	3.159E+00
4.195189E-01	2.44283E+01	9.0984E+00	6.2940E+03	4.4057E+00	0.000E+00	2.955E+00
4.484657E-01	2.48334E+01	9.2709E+00	5.9993E+03	4.7076E+00	0.000E+00	2.765E+00
4.794098E-01	2.52117E+01	9.3700E+00	5.6721E+03	5.0125E+00	0.000E+00	2.586E+00
5.124891E-01	2.55344E+01	9.3853E+00	5.3146E+03	5.3186E+00	0.000E+00	2.419E+00
5.478508E-01	2.57581E+01	9.3131E+00	4.9333E+03	5.6239E+00	0.000E+00	2.263E+00
5.856525E-01	2.58356E+01	9.1646E+00	4.5414E+03	5.9263E+00	0.000E+00	2.117E+00
6.260625E-01	2.57145E+01	8.9538E+00	4.1505E+03	6.2238E+00	0.000E+00	1.980E+00
6.692609E-01	2.53265E+01	8.6950E+00	3.7704E+03	6.5142E+00	0.000E+00	1.853E+00
7.154399E-01	2.45726E+01	8.4015E+00	3.4080E+03	6.7955E+00	0.000E+00	1.733E+00
7.648052E-01	2.32763E+01	8.0850E+00	3.0679E+03	7.0656E+00	0.000E+00	1.621E+00
8.175768E-01	2.10953E+01	7.7559E+00	2.7531E+03	7.3223E+00	0.000E+00	1.516E+00
8.739896E-01	1.72308E+01	7.4221E+00	2.4645E+03	7.5638E+00	0.000E+00	1.419E+00
9.342948E-01	9.12863E+00	7.0895E+00	2.2021E+03	7.7881E+00	0.000E+00	1.327E+00
9.987612E-01	-2.07108E+01	6.7625E+00	1.9650E+03	7.9937E+00	0.000E+00	1.241E+00
1.006362E+00	-3.12480E+01	6.7094E+00	1.9348E+03	8.0158E+00	0.000E+00	1.232E+00
1.021766E+00	-9.03039E+01	6.5972E+00	1.8738E+03	8.0592E+00	0.000E+00	1.213E+00
1.025873E+00	-1.82253E+02	6.5674E+00	1.8579E+03	8.0705E+00	0.000E+00	1.209E+00
1.030470E+00	-6.28678E+01	1.9685E+02	5.5439E+04	8.0830E+00	0.000E+00	1.203E+00
1.032035E+00	-3.46204E+01	1.8230E+02	5.1262E+04	8.0872E+00	0.000E+00	1.201E+00
1.046242E+00	9.74265E+00	9.2293E+01	2.5600E+04	8.1248E+00	0.000E+00	1.185E+00
1.047438E+00	2.73002E+00	8.7297E+01	2.4187E+04	8.1279E+00	0.000E+00	1.184E+00
1.050448E+00	-4.66199E+01	7.5983E+01	2.0992E+04	8.1356E+00	0.000E+00	1.180E+00
1.055757E+00	5.53400E+01	1.7427E+02	4.7859E+04	8.1517E+00	0.000E+00	1.173E+00
1.067676E+00	9.69930E+01	1.0410E+02	2.8295E+04	8.1788E+00	0.000E+00	1.161E+00
1.072530E+00	9.82231E+01	8.3310E+01	2.2542E+04	8.1906E+00	0.000E+00	1.156E+00
1.141345E+00	5.31391E+01	2.1474E+01	5.4602E+03	8.3421E+00	0.000E+00	1.086E+00
1.220098E+00	4.00358E+01	2.0491E+01	4.8739E+03	8.4825E+00	0.000E+00	1.016E+00
1.304235E+00	3.52682E+01	2.3993E+01	5.3385E+03	8.5988E+00	0.000E+00	9.506E-01
1.329762E+00	3.45627E+01	2.5302E+01	5.5219E+03	8.6280E+00	0.000E+00	9.324E-01
1.350115E+00	3.31598E+01	2.6055E+01	5.6006E+03	8.6494E+00	0.000E+00	9.183E-01
1.355543E+00	3.10702E+01	2.6226E+01	5.6148E+03	8.6548E+00	0.000E+00	9.146E-01

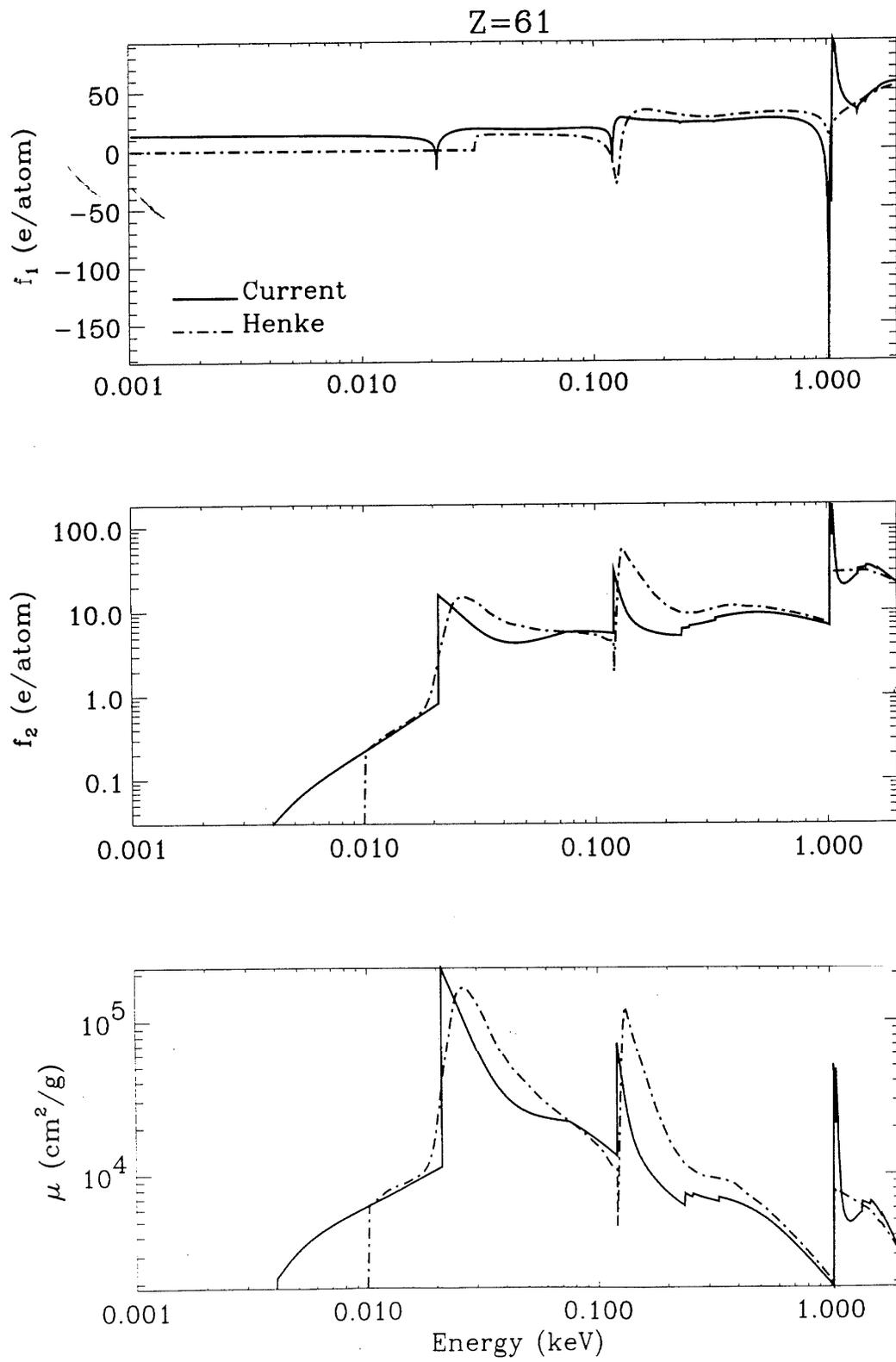
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 433

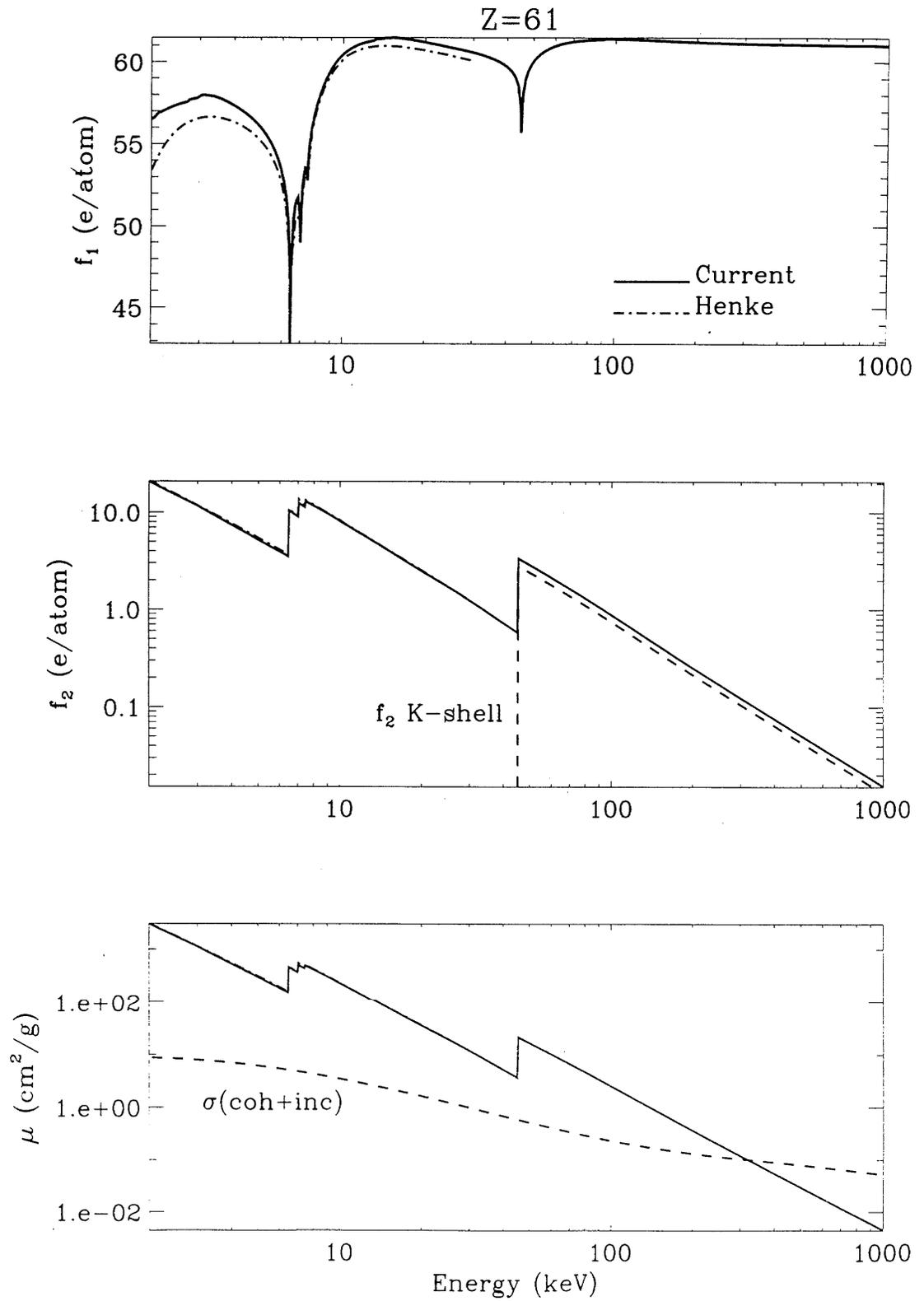
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.363684E+00	3.35620E+01	3.0860E+01	6.5675E+03	8.6627E+00	0.000E+00	9.092E-01
1.384038E+00	3.61837E+01	3.1114E+01	6.5240E+03	8.6815E+00	0.000E+00	8.958E-01
1.394281E+00	3.69343E+01	3.1210E+01	6.4961E+03	8.6904E+00	0.000E+00	8.892E-01
1.441972E+00	3.92420E+01	3.1601E+01	6.3599E+03	8.7270E+00	0.000E+00	8.598E-01
1.464043E+00	3.96497E+01	3.1764E+01	6.2965E+03	8.7414E+00	0.000E+00	8.469E-01
1.469292E+00	3.90393E+01	3.1802E+01	6.2787E+03	8.7450E+00	0.000E+00	8.435E-01
1.478757E+00	4.04854E+01	3.3691E+01	6.6119E+03	8.7502E+00	0.000E+00	8.384E-01
1.490486E+00	4.17773E+01	3.3719E+01	6.5653E+03	8.7567E+00	0.000E+00	8.318E-01
1.500828E+00	4.26969E+01	3.3698E+01	6.5160E+03	8.7621E+00	0.000E+00	8.261E-01
1.593329E+00	4.81698E+01	3.1840E+01	5.7994E+03	8.7974E+00	0.000E+00	7.781E-01
1.613570E+00	4.89574E+01	3.1233E+01	5.6174E+03	8.8022E+00	0.000E+00	7.684E-01
1.638267E+00	4.95007E+01	3.0444E+01	5.3929E+03	8.8067E+00	0.000E+00	7.568E-01
1.644853E+00	4.91613E+01	3.0226E+01	5.3330E+03	8.8077E+00	0.000E+00	7.538E-01
1.654732E+00	5.01331E+01	3.1069E+01	5.4489E+03	8.8090E+00	0.000E+00	7.493E-01
1.679430E+00	5.15092E+01	3.0218E+01	5.2217E+03	8.8113E+00	0.000E+00	7.383E-01
1.703269E+00	5.24314E+01	2.9389E+01	5.0074E+03	8.8123E+00	0.000E+00	7.279E-01
1.820795E+00	5.51592E+01	2.5477E+01	4.0607E+03	8.8017E+00	0.000E+00	6.809E-01
1.946430E+00	5.63045E+01	2.2054E+01	3.2882E+03	8.7659E+00	0.000E+00	6.370E-01
2.080733E+00	5.67615E+01	1.9415E+01	2.7079E+03	8.7055E+00	0.000E+00	5.959E-01
2.224304E+00	5.70313E+01	1.7664E+01	2.3046E+03	8.6213E+00	0.000E+00	5.574E-01
2.377781E+00	5.72578E+01	1.6083E+01	1.9629E+03	8.5142E+00	0.000E+00	5.214E-01
2.541848E+00	5.74366E+01	1.4655E+01	1.6731E+03	8.3854E+00	0.000E+00	4.878E-01
2.717235E+00	5.76654E+01	1.3375E+01	1.4285E+03	8.2363E+00	0.000E+00	4.563E-01
2.904724E+00	5.77730E+01	1.2204E+01	1.2193E+03	8.0681E+00	0.000E+00	4.268E-01
3.105150E+00	5.79683E+01	1.1046E+01	1.0324E+03	7.8825E+00	0.000E+00	3.993E-01
3.319406E+00	5.79231E+01	9.9289E+00	8.6807E+02	7.6811E+00	0.000E+00	3.735E-01
3.548445E+00	5.77660E+01	8.9307E+00	7.3040E+02	7.4655E+00	0.000E+00	3.494E-01
3.793288E+00	5.75448E+01	8.0443E+00	6.1544E+02	7.2376E+00	0.000E+00	3.269E-01
4.055024E+00	5.72709E+01	7.2561E+00	5.1931E+02	6.9990E+00	0.000E+00	3.058E-01
4.334821E+00	5.69459E+01	6.5544E+00	4.3881E+02	6.7516E+00	0.000E+00	2.860E-01
4.633924E+00	5.65589E+01	5.9072E+00	3.6995E+02	6.4971E+00	0.000E+00	2.676E-01
4.953664E+00	5.60639E+01	5.3120E+00	3.1120E+02	6.2371E+00	0.000E+00	2.503E-01
5.295467E+00	5.54141E+01	4.7850E+00	2.6223E+02	5.9734E+00	0.000E+00	2.341E-01
5.660855E+00	5.44933E+01	4.3185E+00	2.2139E+02	5.7076E+00	0.000E+00	2.190E-01
6.051453E+00	5.29075E+01	3.8956E+00	1.8682E+02	5.4411E+00	0.000E+00	2.049E-01
6.330114E+00	5.02829E+01	3.6294E+00	1.6639E+02	5.2616E+00	0.000E+00	1.959E-01
6.427004E+00	4.71930E+01	3.5428E+00	1.5998E+02	5.2013E+00	0.000E+00	1.929E-01
6.452841E+00	4.36091E+01	3.5200E+00	1.5831E+02	5.1853E+00	0.000E+00	1.921E-01
6.469004E+00	4.44402E+01	1.0534E+01	4.7257E+02	5.1754E+00	0.000E+00	1.917E-01
6.491597E+00	4.71568E+01	1.0459E+01	4.6756E+02	5.1616E+00	0.000E+00	1.910E-01
6.588486E+00	5.02049E+01	1.0145E+01	4.4688E+02	5.1028E+00	0.000E+00	1.882E-01
6.872544E+00	5.17067E+01	9.3341E+00	3.9416E+02	4.9362E+00	0.000E+00	1.804E-01
6.915365E+00	5.15211E+01	9.2306E+00	3.8737E+02	4.9118E+00	0.000E+00	1.793E-01
6.977736E+00	5.06636E+01	9.0844E+00	3.7783E+02	4.8765E+00	0.000E+00	1.777E-01
7.005787E+00	4.89754E+01	9.0205E+00	3.7366E+02	4.8608E+00	0.000E+00	1.770E-01
7.047864E+00	5.09205E+01	1.2435E+01	5.1203E+02	4.8374E+00	0.000E+00	1.759E-01
7.153056E+00	5.27796E+01	1.2089E+01	4.9046E+02	4.7795E+00	0.000E+00	1.733E-01
7.279342E+00	5.36031E+01	1.1696E+01	4.6628E+02	4.7113E+00	0.000E+00	1.703E-01
7.392525E+00	5.35120E+01	1.1369E+01	4.4633E+02	4.6515E+00	0.000E+00	1.677E-01
7.420472E+00	5.27858E+01	1.1295E+01	4.4176E+02	4.6369E+00	0.000E+00	1.671E-01
7.465039E+00	5.38921E+01	1.2942E+01	5.0314E+02	4.6138E+00	0.000E+00	1.661E-01
7.576458E+00	5.51658E+01	1.2650E+01	4.8456E+02	4.5567E+00	0.000E+00	1.636E-01
7.902609E+00	5.68936E+01	1.1871E+01	4.3594E+02	4.3957E+00	0.000E+00	1.569E-01
8.447890E+00	5.84739E+01	1.0736E+01	3.6882E+02	4.1453E+00	0.000E+00	1.468E-01
9.030794E+00	5.95133E+01	9.6674E+00	3.1067E+02	3.9012E+00	0.000E+00	1.373E-01
9.653919E+00	6.02080E+01	8.6411E+00	2.5976E+02	3.6642E+00	0.000E+00	1.284E-01
1.032004E+01	6.06562E+01	7.7194E+00	2.1708E+02	3.4350E+00	0.000E+00	1.201E-01
1.103212E+01	6.09484E+01	6.9021E+00	1.8156E+02	3.2141E+00	0.000E+00	1.124E-01
1.179334E+01	6.11371E+01	6.1767E+00	1.5200E+02	3.0018E+00	0.000E+00	1.051E-01
1.260708E+01	6.12555E+01	5.5326E+00	1.2736E+02	2.7987E+00	0.000E+00	9.834E-02
1.347697E+01	6.13937E+01	4.9456E+00	1.0650E+02	2.6048E+00	0.000E+00	9.200E-02
1.440688E+01	6.14520E+01	4.4134E+00	8.8903E+01	2.4204E+00	0.000E+00	8.606E-02
1.540095E+01	6.14702E+01	3.9290E+00	7.4037E+01	2.2455E+00	0.000E+00	8.050E-02
1.646362E+01	6.14233E+01	3.4954E+00	6.1614E+01	2.0802E+00	0.000E+00	7.531E-02
1.759961E+01	6.13558E+01	3.1123E+00	5.1320E+01	1.9243E+00	0.000E+00	7.045E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.881398E+01	6.12751E+01	2.7736E+00	4.2784E+01	1.7777E+00	0.000E+00	6.590E-02
2.011215E+01	6.11858E+01	2.4740E+00	3.5699E+01	1.6403E+00	0.000E+00	6.165E-02
2.149988E+01	6.10911E+01	2.2088E+00	2.9814E+01	1.5117E+00	0.000E+00	5.767E-02
2.298338E+01	6.09926E+01	1.9735E+00	2.4919E+01	1.3918E+00	0.000E+00	5.395E-02
2.456923E+01	6.08916E+01	1.7648E+00	2.0845E+01	1.2802E+00	0.000E+00	5.046E-02
2.626450E+01	6.07901E+01	1.5796E+00	1.7454E+01	1.1766E+00	0.000E+00	4.721E-02
2.807676E+01	6.06889E+01	1.4043E+00	1.4516E+01	1.0806E+00	0.000E+00	4.416E-02
3.001405E+01	6.05693E+01	1.2431E+00	1.2019E+01	9.9195E-01	0.000E+00	4.131E-02
3.208502E+01	6.04331E+01	1.1000E+00	9.9491E+00	9.1018E-01	0.000E+00	3.864E-02
3.429889E+01	6.02729E+01	9.6981E-01	8.2058E+00	8.3495E-01	0.000E+00	3.615E-02
3.666551E+01	6.00727E+01	8.5514E-01	6.7684E+00	7.6586E-01	0.000E+00	3.381E-02
3.919543E+01	5.97978E+01	7.5440E-01	5.5857E+00	7.0255E-01	0.000E+00	3.163E-02
4.189992E+01	5.93350E+01	6.6606E-01	4.6133E+00	6.4463E-01	0.000E+00	2.959E-02
4.428032E+01	5.82962E+01	6.0115E-01	3.9399E+00	6.0049E-01	0.000E+00	2.800E-02
4.479101E+01	5.75906E+01	5.8853E-01	3.8132E+00	5.9174E-01	0.000E+00	2.768E-02
4.495808E+01	5.71110E+01	5.8449E-01	3.7730E+00	5.8893E-01	0.000E+00	2.758E-02
4.513881E+01	5.65908E+01	5.8017E-01	3.7301E+00	5.8592E-01	0.000E+00	2.747E-02
4.540992E+01	5.71266E+01	3.3700E+00	2.1537E+01	5.8146E-01	1.787E+01	2.730E-02
4.608768E+01	5.84243E+01	3.2928E+00	2.0734E+01	5.7037E-01	1.722E+01	2.690E-02
4.788159E+01	5.94838E+01	3.1007E+00	1.8793E+01	5.4353E-01	1.564E+01	2.589E-02
5.118542E+01	6.02477E+01	2.7819E+00	1.5773E+01	4.9966E-01	1.316E+01	2.422E-02
5.471721E+01	6.06492E+01	2.4927E+00	1.3221E+01	4.5978E-01	1.106E+01	2.266E-02
5.849270E+01	6.09005E+01	2.2324E+00	1.1076E+01	4.2360E-01	9.282E+00	2.120E-02
6.252870E+01	6.10674E+01	1.9950E+00	9.2594E+00	3.9080E-01	7.771E+00	1.983E-02
6.684318E+01	6.11788E+01	1.7825E+00	7.7388E+00	3.6110E-01	6.503E+00	1.855E-02
7.145536E+01	6.12539E+01	1.5924E+00	6.4675E+00	3.3424E-01	5.441E+00	1.735E-02
7.638578E+01	6.13038E+01	1.4225E+00	5.4046E+00	3.0996E-01	4.551E+00	1.623E-02
8.165640E+01	6.13369E+01	1.2691E+00	4.5102E+00	2.8803E-01	3.802E+00	1.518E-02
8.729069E+01	6.13547E+01	1.1288E+00	3.7529E+00	2.6823E-01	3.169E+00	1.420E-02
9.331374E+01	6.13914E+01	1.0024E+00	3.1174E+00	2.5035E-01	2.636E+00	1.329E-02
9.975239E+01	6.13874E+01	8.8835E-01	2.5845E+00	2.3420E-01	2.187E+00	1.243E-02
1.066353E+02	6.13770E+01	7.8738E-01	2.1499E+00	2.1962E-01	1.815E+00	1.163E-02
1.139931E+02	6.13625E+01	6.9796E-01	1.7769E+00	2.0643E-01	1.506E+00	1.088E-02
1.218587E+02	6.13452E+01	6.1874E-01	1.4736E+00	1.9450E-01	1.249E+00	1.017E-02
1.302669E+02	6.13264E+01	5.4857E-01	1.2221E+00	1.8369E-01	1.037E+00	9.518E-03
1.392553E+02	6.13067E+01	4.8639E-01	1.0136E+00	1.7388E-01	8.601E-01	8.903E-03
1.488640E+02	6.12867E+01	4.3129E-01	8.4080E-01	1.6495E-01	7.136E-01	8.329E-03
1.591356E+02	6.12669E+01	3.8247E-01	6.9749E-01	1.5682E-01	5.921E-01	7.791E-03
1.701159E+02	6.12475E+01	3.3920E-01	5.7865E-01	1.4938E-01	4.913E-01	7.288E-03
1.818539E+02	6.12287E+01	3.0084E-01	4.8009E-01	1.4256E-01	4.076E-01	6.818E-03
1.944018E+02	6.12105E+01	2.6684E-01	3.9835E-01	1.3628E-01	3.382E-01	6.378E-03
2.078156E+02	6.11934E+01	2.3733E-01	3.3143E-01	1.3047E-01	2.815E-01	5.966E-03
2.221548E+02	6.11775E+01	2.1117E-01	2.7586E-01	1.2509E-01	2.344E-01	5.581E-03
2.374835E+02	6.11627E+01	1.8790E-01	2.2962E-01	1.2008E-01	1.952E-01	5.221E-03
2.538699E+02	6.11489E+01	1.6721E-01	1.9114E-01	1.1540E-01	1.625E-01	4.884E-03
2.713869E+02	6.11362E+01	1.4880E-01	1.5912E-01	1.1099E-01	1.353E-01	4.569E-03
2.901126E+02	6.11244E+01	1.3243E-01	1.3247E-01	1.0684E-01	1.127E-01	4.274E-03
3.101304E+02	6.11135E+01	1.1786E-01	1.1029E-01	1.0291E-01	9.381E-02	3.998E-03
3.315294E+02	6.11035E+01	1.0491E-01	9.1832E-02	9.9162E-02	7.811E-02	3.740E-03
3.544019E+02	6.10942E+01	9.3380E-02	7.6466E-02	9.5587E-02	6.504E-02	3.498E-03
3.788588E+02	6.10857E+01	8.3124E-02	6.3674E-02	9.2161E-02	5.416E-02	3.273E-03
4.050001E+02	6.10779E+01	7.3998E-02	5.3024E-02	8.8867E-02	4.509E-02	3.061E-03
4.329451E+02	6.10707E+01	6.5877E-02	4.4158E-02	8.5690E-02	3.755E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 437

Sm Z = 62

atomic weight = 1.503600E+02 g/mol, nominal density ρ (g/cm³) = 7.5100E+00

f_1 (e/atom) = μ (cm²/g) × 2.49679E+02, E (eV) μ (cm²/g) = f_2 (e/atom) × 2.79864E+05

edges. Edge energies (keV):

K	4.68342E+00	L	I	7.73680E+00	L	II	7.31180E+00	L	III	6.71620E+00
M	1.72280E+00	M	II	1.54070E+00	M	III	1.41980E+00	M	IV	1.10600E+00
N	1.08020E+00	N	I	3.45700E-00	N	II	2.65600E-00	N	III	2.47400E-01
O	1.29000E-00	N	V	1.29000E-00	O	I	5.50000E-03	O	II	3.74000E-02
P	2.13000E-02	N	VI	2.13000E-02						

relativistic correction f_{rel} (H82,3/5CL) = -9.1787E-01, -5.5500E-01 e/atom

clear Thomson correction f_{N1} = -1.4025E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
5.390000E-03	1.26627E+01	0.0000E+00	0.0000E+00	6.9802E-06	0.000E+00	2.300E+02
5.472500E-03	1.26395E+01	0.0000E+00	0.0000E+00	7.5801E-06	0.000E+00	2.266E+02
5.494500E-03	1.26200E+01	0.0000E+00	0.0000E+00	7.7466E-06	0.000E+00	2.257E+02
5.527500E-03	1.26329E+01	3.3428E-02	1.6925E+03	8.0016E-06	0.000E+00	2.243E+02
5.610000E-03	1.26384E+01	3.5067E-02	1.7494E+03	8.6676E-06	0.000E+00	2.210E+02
1.069000E-02	1.19895E+01	1.9065E-01	4.9912E+03	2.1769E-04	0.000E+00	1.160E+02
1.142761E-02	1.18453E+01	2.1975E-01	5.3817E+03	2.9547E-04	0.000E+00	1.085E+02
1.221612E-02	1.16714E+01	2.5270E-01	5.7893E+03	3.9898E-04	0.000E+00	1.015E+02
1.305903E-02	1.14588E+01	2.9009E-01	6.2168E+03	5.3599E-04	0.000E+00	9.494E+01
1.396010E-02	1.11936E+01	3.3254E-01	6.6666E+03	7.1638E-04	0.000E+00	8.881E+01
1.492335E-02	1.08539E+01	3.8080E-01	7.1413E+03	9.5263E-04	0.000E+00	8.308E+01
1.595306E-02	1.04023E+01	4.3567E-01	7.6430E+03	1.2604E-03	0.000E+00	7.772E+01
1.705382E-02	9.80180E+00	4.9806E-01	8.1735E+03	1.6593E-03	0.000E+00	7.270E+01
1.823053E-02	8.82703E+00	5.6895E-01	8.7342E+03	2.1736E-03	0.000E+00	6.801E+01
1.948844E-02	7.04772E+00	6.4942E-01	9.3260E+03	2.8332E-03	0.000E+00	6.362E+01
2.083314E-02	1.54367E+00	7.4060E-01	9.9489E+03	3.6748E-03	0.000E+00	5.951E+01
2.087400E-02	1.13415E+00	7.4345E-01	9.9677E+03	3.7027E-03	0.000E+00	5.940E+01
2.119350E-02	-5.42605E+00	7.6591E-01	1.0114E+04	3.9257E-03	0.000E+00	5.850E+01
2.127870E-02	-1.35144E+01	7.7195E-01	1.0153E+04	3.9867E-03	0.000E+00	5.827E+01
2.140650E-02	-4.77791E+00	1.6823E+01	2.1994E+05	4.0793E-03	0.000E+00	5.792E+01
2.172600E-02	2.94811E+00	1.6205E+01	2.0874E+05	4.3170E-03	0.000E+00	5.707E+01
2.227063E-02	7.74165E+00	1.5230E+01	1.9139E+05	4.7431E-03	0.000E+00	5.567E+01
2.380730E-02	1.31791E+01	1.2929E+01	1.5198E+05	6.0922E-03	0.000E+00	5.208E+01
2.545001E-02	1.56856E+01	1.0907E+01	1.1994E+05	7.7874E-03	0.000E+00	4.872E+01
2.720606E-02	1.69697E+01	9.1675E+00	9.4305E+04	9.9064E-03	0.000E+00	4.557E+01
2.908327E-02	1.75776E+01	7.7466E+00	7.4545E+04	1.2542E-02	0.000E+00	4.263E+01
3.109002E-02	1.77918E+01	6.6351E+00	5.9727E+04	1.5804E-02	0.000E+00	3.988E+01
3.323523E-02	1.77805E+01	5.7999E+00	4.8839E+04	1.9820E-02	0.000E+00	3.731E+01
3.552846E-02	1.76467E+01	5.1995E+00	4.0958E+04	2.4740E-02	0.000E+00	3.490E+01
3.665200E-02	1.75585E+01	4.9880E+00	3.8087E+04	2.7394E-02	0.000E+00	3.383E+01
3.721300E-02	1.75059E+01	4.8988E+00	3.6842E+04	2.8779E-02	0.000E+00	3.332E+01
3.736260E-02	1.74830E+01	4.8768E+00	3.6529E+04	2.9155E-02	0.000E+00	3.318E+01
3.758700E-02	1.74764E+01	4.8670E+00	3.6238E+04	2.9725E-02	0.000E+00	3.299E+01
3.797993E-02	1.74536E+01	4.8155E+00	3.5484E+04	3.0739E-02	0.000E+00	3.264E+01
3.814800E-02	1.74423E+01	4.7949E+00	3.5176E+04	3.1178E-02	0.000E+00	3.250E+01
4.060054E-02	1.72685E+01	4.5712E+00	3.1510E+04	3.8015E-02	0.000E+00	3.054E+01
4.340198E-02	1.70890E+01	4.4534E+00	2.8716E+04	4.6799E-02	0.000E+00	2.857E+01
4.639671E-02	1.69349E+01	4.4363E+00	2.6760E+04	5.7350E-02	0.000E+00	2.672E+01
4.959809E-02	1.68151E+01	4.4994E+00	2.5388E+04	6.9961E-02	0.000E+00	2.500E+01
5.302035E-02	1.67350E+01	4.6244E+00	2.4410E+04	8.4961E-02	0.000E+00	2.338E+01
5.667876E-02	1.66946E+01	4.7895E+00	2.3649E+04	1.0272E-01	0.000E+00	2.187E+01
6.058959E-02	1.66887E+01	4.9941E+00	2.3068E+04	1.2363E-01	0.000E+00	2.046E+01
6.477028E-02	1.67318E+01	5.2307E+00	2.2601E+04	1.4815E-01	0.000E+00	1.914E+01
6.923942E-02	1.67934E+01	5.4931E+00	2.2203E+04	1.7676E-01	0.000E+00	1.791E+01
7.401695E-02	1.68862E+01	5.7767E+00	2.1842E+04	2.0997E-01	0.000E+00	1.675E+01
7.912411E-02	1.70075E+01	6.0781E+00	2.1498E+04	2.4834E-01	0.000E+00	1.567E+01
8.458368E-02	1.71534E+01	6.3945E+00	2.1158E+04	2.9248E-01	0.000E+00	1.466E+01
9.041995E-02	1.73175E+01	6.7245E+00	2.0813E+04	3.4298E-01	0.000E+00	1.371E+01
9.665893E-02	1.74882E+01	7.0670E+00	2.0462E+04	4.0051E-01	0.000E+00	1.283E+01
1.033284E-01	1.76377E+01	7.4187E+00	2.0093E+04	4.6573E-01	0.000E+00	1.200E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.104581E-01	1.75779E+01	7.3833E+00	1.8707E+04	5.3931E-01	0.000E+00	1.122E+01
1.180797E-01	1.67935E+01	7.3107E+00	1.7327E+04	6.2194E-01	0.000E+00	1.050E+01
1.262272E-01	1.21953E+01	7.2022E+00	1.5968E+04	7.1428E-01	0.000E+00	9.822E+00
1.264200E-01	1.18732E+01	7.1993E+00	1.5938E+04	7.1651E-01	0.000E+00	9.807E+00
1.283550E-01	4.57123E+00	7.1696E+00	1.5633E+04	7.3901E-01	0.000E+00	9.659E+00
1.288710E-01	-5.60711E+00	7.1615E+00	1.5552E+04	7.4504E-01	0.000E+00	9.621E+00
1.296450E-01	7.46222E+00	2.7774E+01	5.9956E+04	7.5412E-01	0.000E+00	9.563E+00
1.315800E-01	1.85482E+01	2.4102E+01	5.1264E+04	7.7695E-01	0.000E+00	9.423E+00
1.349368E-01	2.42054E+01	1.9268E+01	3.9963E+04	8.1698E-01	0.000E+00	9.188E+00
1.442475E-01	2.66405E+01	1.2019E+01	2.3318E+04	9.3068E-01	0.000E+00	8.595E+00
1.542005E-01	2.59725E+01	9.3022E+00	1.6883E+04	1.0559E+00	0.000E+00	8.040E+00
1.648404E-01	2.54221E+01	8.1361E+00	1.3813E+04	1.1933E+00	0.000E+00	7.521E+00
1.762144E-01	2.50802E+01	7.4982E+00	1.1909E+04	1.3432E+00	0.000E+00	7.036E+00
1.883732E-01	2.48489E+01	7.0809E+00	1.0520E+04	1.5060E+00	0.000E+00	6.582E+00
2.013709E-01	2.46523E+01	6.7785E+00	9.4208E+03	1.6819E+00	0.000E+00	6.157E+00
2.152655E-01	2.44326E+01	6.5526E+00	8.5190E+03	1.8711E+00	0.000E+00	5.760E+00
2.301188E-01	2.41117E+01	6.3906E+00	7.7721E+03	2.0737E+00	0.000E+00	5.388E+00
2.424520E-01	2.35743E+01	6.3065E+00	7.2796E+03	2.2413E+00	0.000E+00	5.114E+00
2.459970E-01	2.31082E+01	6.2898E+00	7.1557E+03	2.2894E+00	0.000E+00	5.040E+00
2.461630E-01	2.30637E+01	6.2891E+00	7.1501E+03	2.2916E+00	0.000E+00	5.037E+00
2.471526E-01	2.25093E+01	6.2850E+00	7.1169E+03	2.3050E+00	0.000E+00	5.017E+00
2.486370E-01	2.30267E+01	7.3376E+00	8.2591E+03	2.3251E+00	0.000E+00	4.987E+00
2.523480E-01	2.34389E+01	7.3380E+00	8.1381E+03	2.3752E+00	0.000E+00	4.913E+00
2.602880E-01	2.36149E+01	7.3492E+00	7.9019E+03	2.4821E+00	0.000E+00	4.763E+00
2.629708E-01	2.35887E+01	7.3560E+00	7.8285E+03	2.5180E+00	0.000E+00	4.715E+00
2.642720E-01	2.35359E+01	7.3598E+00	7.7940E+03	2.5354E+00	0.000E+00	4.692E+00
2.653344E-01	2.33800E+01	7.3632E+00	7.7664E+03	2.5496E+00	0.000E+00	4.673E+00
2.669280E-01	2.35687E+01	7.7018E+00	8.0751E+03	2.5709E+00	0.000E+00	4.645E+00
2.709120E-01	2.37570E+01	7.7221E+00	7.9773E+03	2.6240E+00	0.000E+00	4.577E+00
2.811158E-01	2.39501E+01	7.7859E+00	7.7513E+03	2.7591E+00	0.000E+00	4.410E+00
3.005128E-01	2.41360E+01	7.9430E+00	7.3972E+03	3.0121E+00	0.000E+00	4.126E+00
3.212482E-01	2.42503E+01	8.1448E+00	7.0955E+03	3.2761E+00	0.000E+00	3.859E+00
3.387860E-01	2.42230E+01	8.3278E+00	6.8794E+03	3.4938E+00	0.000E+00	3.660E+00
3.434143E-01	2.40876E+01	8.3764E+00	6.8263E+03	3.5503E+00	0.000E+00	3.610E+00
3.439715E-01	2.40469E+01	8.3823E+00	6.8200E+03	3.5571E+00	0.000E+00	3.604E+00
3.453543E-01	2.37930E+01	8.3968E+00	6.8045E+03	3.5739E+00	0.000E+00	3.590E+00
3.474285E-01	2.40828E+01	8.9431E+00	7.2039E+03	3.5990E+00	0.000E+00	3.569E+00
3.526140E-01	2.43706E+01	9.0004E+00	7.1434E+03	3.6615E+00	0.000E+00	3.516E+00
3.671099E-01	2.47276E+01	9.1564E+00	6.9803E+03	3.8335E+00	0.000E+00	3.377E+00
3.924405E-01	2.51495E+01	9.4048E+00	6.7069E+03	4.1244E+00	0.000E+00	3.159E+00
4.195189E-01	2.55827E+01	9.6195E+00	6.4172E+03	4.4216E+00	0.000E+00	2.955E+00
4.484657E-01	2.60155E+01	9.7825E+00	6.1047E+03	4.7235E+00	0.000E+00	2.765E+00
4.794098E-01	2.64347E+01	9.8809E+00	5.7682E+03	5.0283E+00	0.000E+00	2.586E+00
5.124891E-01	2.68172E+01	9.9070E+00	5.4101E+03	5.3343E+00	0.000E+00	2.419E+00
5.478508E-01	2.71333E+01	9.8523E+00	5.0330E+03	5.6393E+00	0.000E+00	2.263E+00
5.856525E-01	2.73386E+01	9.7144E+00	4.6422E+03	5.9415E+00	0.000E+00	2.117E+00
6.260625E-01	2.73853E+01	9.5062E+00	4.2495E+03	6.2388E+00	0.000E+00	1.980E+00
6.692609E-01	2.72192E+01	9.2425E+00	3.8649E+03	6.5289E+00	0.000E+00	1.853E+00
7.154399E-01	2.67680E+01	8.9378E+00	3.4963E+03	6.8099E+00	0.000E+00	1.733E+00
7.648052E-01	2.59251E+01	8.6055E+00	3.1490E+03	7.0797E+00	0.000E+00	1.621E+00
8.175768E-01	2.44866E+01	8.2573E+00	2.8265E+03	7.3361E+00	0.000E+00	1.516E+00
8.739896E-01	2.20524E+01	7.9025E+00	2.5305E+03	7.5773E+00	0.000E+00	1.419E+00
9.342948E-01	1.76240E+01	7.5483E+00	2.2611E+03	7.8014E+00	0.000E+00	1.327E+00
9.987612E-01	7.62859E+00	7.2000E+00	2.0175E+03	8.0068E+00	0.000E+00	1.241E+00
1.058596E+00	-2.82664E+01	6.7464E+00	1.7836E+03	8.1692E+00	0.000E+00	1.171E+00
1.067676E+00	-4.86805E+01	6.6812E+00	1.7513E+03	8.1917E+00	0.000E+00	1.161E+00
1.074799E+00	-8.59703E+01	6.6305E+00	1.7265E+03	8.2090E+00	0.000E+00	1.154E+00
1.079120E+00	-1.75445E+02	6.6001E+00	1.7117E+03	8.2193E+00	0.000E+00	1.149E+00
1.083880E+00	-6.13805E+01	1.9232E+02	4.9657E+04	8.2305E+00	0.000E+00	1.144E+00
1.085601E+00	-3.23916E+01	1.7763E+02	4.5793E+04	8.2345E+00	0.000E+00	1.142E+00
1.100470E+00	1.08103E+01	9.0944E+01	2.3128E+04	8.2685E+00	0.000E+00	1.127E+00
1.101804E+00	3.46767E+00	8.5790E+01	2.1791E+04	8.2715E+00	0.000E+00	1.125E+00
1.104894E+00	-4.42086E+01	7.5043E+01	1.9008E+04	8.2783E+00	0.000E+00	1.122E+00
1.111530E+00	5.55871E+01	1.7135E+02	4.3144E+04	8.2929E+00	0.000E+00	1.115E+00
1.128120E+00	9.80484E+01	8.2475E+01	2.0460E+04	8.3280E+00	0.000E+00	1.099E+00

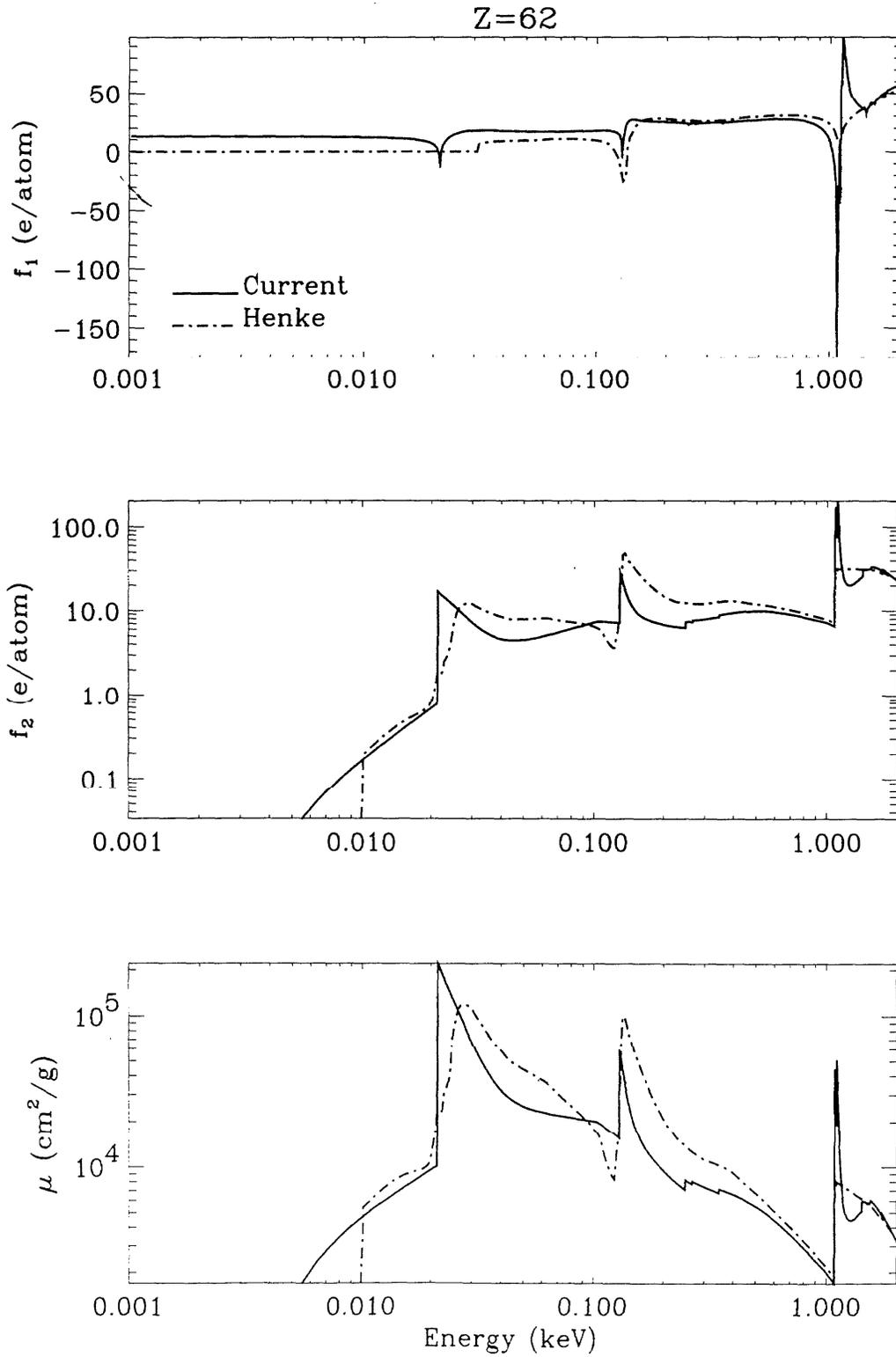
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 439

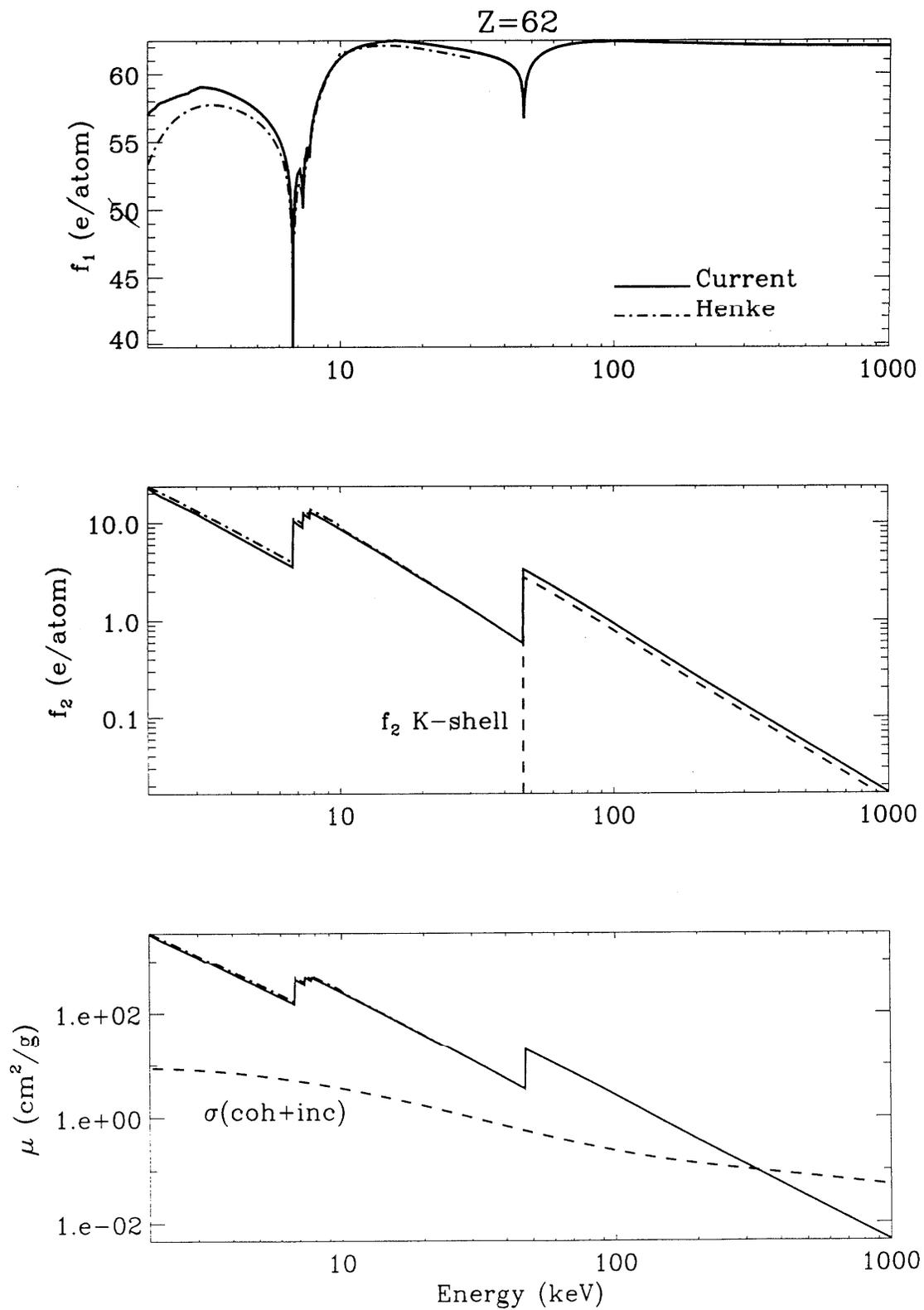
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.141345E+00	8.92801E+01	5.0508E+01	1.2385E+04	8.3549E+00	0.000E+00	1.086E+00
1.220098E+00	4.95530E+01	2.0527E+01	4.7084E+03	8.4952E+00	0.000E+00	1.016E+00
1.304285E+00	3.96116E+01	2.1087E+01	4.5247E+03	8.6115E+00	0.000E+00	9.506E-01
1.391404E+00	3.58211E+01	2.4884E+01	5.0051E+03	8.7007E+00	0.000E+00	8.911E-01
1.394281E+00	3.57153E+01	2.5023E+01	5.0226E+03	8.7032E+00	0.000E+00	8.892E-01
1.412701E+00	3.43527E+01	2.5754E+01	5.1019E+03	8.7182E+00	0.000E+00	8.776E-01
1.418380E+00	3.22479E+01	2.5922E+01	5.1148E+03	8.7227E+00	0.000E+00	8.741E-01
1.426899E+00	3.47203E+01	3.0566E+01	5.9950E+03	8.7291E+00	0.000E+00	8.689E-01
1.448196E+00	3.73457E+01	3.0908E+01	5.9730E+03	8.7441E+00	0.000E+00	8.561E-01
1.490486E+00	3.97283E+01	3.1249E+01	5.8675E+03	8.7696E+00	0.000E+00	8.318E-01
1.509886E+00	4.04676E+01	3.1410E+01	5.8220E+03	8.7795E+00	0.000E+00	8.211E-01
1.532996E+00	4.08754E+01	3.1572E+01	5.7638E+03	8.7899E+00	0.000E+00	8.088E-01
1.539159E+00	4.02580E+01	3.1610E+01	5.7475E+03	8.7924E+00	0.000E+00	8.055E-01
1.548403E+00	4.17223E+01	3.3517E+01	6.0581E+03	8.7960E+00	0.000E+00	8.007E-01
1.571514E+00	4.38617E+01	3.3441E+01	5.9553E+03	8.8041E+00	0.000E+00	7.889E-01
1.593329E+00	4.53584E+01	3.3219E+01	5.8348E+03	8.8104E+00	0.000E+00	7.781E-01
1.688344E+00	4.99084E+01	3.1007E+01	5.1398E+03	8.8250E+00	0.000E+00	7.344E-01
1.703269E+00	5.03148E+01	3.0569E+01	5.0228E+03	8.8256E+00	0.000E+00	7.279E-01
1.714186E+00	5.04351E+01	3.0239E+01	4.9369E+03	8.8257E+00	0.000E+00	7.233E-01
1.721077E+00	5.00904E+01	3.0028E+01	4.8828E+03	8.8256E+00	0.000E+00	7.204E-01
1.731414E+00	5.10595E+01	3.0882E+01	4.9917E+03	8.8254E+00	0.000E+00	7.161E-01
1.757256E+00	5.24272E+01	3.0052E+01	4.7861E+03	8.8239E+00	0.000E+00	7.056E-01
1.820795E+00	5.44469E+01	2.8002E+01	4.3041E+03	8.8152E+00	0.000E+00	6.809E-01
1.946430E+00	5.65598E+01	2.4273E+01	3.4901E+03	8.7798E+00	0.000E+00	6.370E-01
2.080733E+00	5.74177E+01	2.1142E+01	2.8437E+03	8.7197E+00	0.000E+00	5.959E-01
2.224304E+00	5.79036E+01	1.8839E+01	2.3703E+03	8.6359E+00	0.000E+00	5.574E-01
2.377781E+00	5.81303E+01	1.7177E+01	2.0217E+03	8.5292E+00	0.000E+00	5.214E-01
2.541848E+00	5.83666E+01	1.5650E+01	1.7231E+03	8.4009E+00	0.000E+00	4.878E-01
2.717235E+00	5.85529E+01	1.4270E+01	1.4697E+03	8.2522E+00	0.000E+00	4.563E-01
2.904724E+00	5.88209E+01	1.3027E+01	1.2551E+03	8.0845E+00	0.000E+00	4.268E-01
3.105150E+00	5.90602E+01	1.1797E+01	1.0632E+03	7.8993E+00	0.000E+00	3.993E-01
3.319406E+00	5.90207E+01	1.0598E+01	8.9357E+02	7.6984E+00	0.000E+00	3.735E-01
3.548445E+00	5.89151E+01	9.5323E+00	7.5181E+02	7.4832E+00	0.000E+00	3.494E-01
3.793288E+00	5.87228E+01	8.5812E+00	6.3311E+02	7.2557E+00	0.000E+00	3.269E-01
4.055024E+00	5.84761E+01	7.7360E+00	5.3391E+02	7.0175E+00	0.000E+00	3.058E-01
4.334821E+00	5.81800E+01	6.9839E+00	4.5089E+02	6.7704E+00	0.000E+00	2.860E-01
4.633924E+00	5.78318E+01	6.3137E+00	3.8131E+02	6.5161E+00	0.000E+00	2.676E-01
4.953664E+00	5.74103E+01	5.6849E+00	3.2117E+02	6.2563E+00	0.000E+00	2.503E-01
5.295467E+00	5.68644E+01	5.1162E+00	2.7039E+02	5.9928E+00	0.000E+00	2.341E-01
5.660855E+00	5.61302E+01	4.6131E+00	2.2807E+02	5.7270E+00	0.000E+00	2.190E-01
6.051453E+00	5.50264E+01	4.1674E+00	1.9273E+02	5.4605E+00	0.000E+00	2.049E-01
6.469004E+00	5.27472E+01	3.7560E+00	1.6249E+02	5.1948E+00	0.000E+00	1.917E-01
6.581876E+00	5.13760E+01	3.6557E+00	1.5544E+02	5.1261E+00	0.000E+00	1.884E-01
6.682619E+00	4.82974E+01	3.5699E+00	1.4950E+02	5.0660E+00	0.000E+00	1.855E-01
6.709484E+00	4.47163E+01	3.5469E+00	1.4795E+02	5.0501E+00	0.000E+00	1.848E-01
6.749781E+00	4.82774E+01	1.0486E+01	4.3478E+02	5.0265E+00	0.000E+00	1.837E-01
6.850524E+00	5.13435E+01	1.0155E+01	4.1488E+02	4.9681E+00	0.000E+00	1.810E-01
6.915365E+00	5.21218E+01	9.9509E+00	4.0271E+02	4.9310E+00	0.000E+00	1.793E-01
7.165564E+00	5.28838E+01	9.2642E+00	3.6183E+02	4.7918E+00	0.000E+00	1.730E-01
7.275241E+00	5.18181E+01	9.0154E+00	3.4680E+02	4.7326E+00	0.000E+00	1.704E-01
7.304488E+00	5.01326E+01	8.9518E+00	3.4298E+02	4.7170E+00	0.000E+00	1.697E-01
7.348359E+00	5.20594E+01	1.2348E+01	4.7029E+02	4.6938E+00	0.000E+00	1.687E-01
7.392525E+00	5.30809E+01	1.2208E+01	4.6216E+02	4.6706E+00	0.000E+00	1.677E-01
7.458036E+00	5.38886E+01	1.2005E+01	4.5049E+02	4.6364E+00	0.000E+00	1.662E-01
7.582064E+00	5.46545E+01	1.1638E+01	4.2957E+02	4.5728E+00	0.000E+00	1.635E-01
7.698116E+00	5.45824E+01	1.1318E+01	4.1147E+02	4.5145E+00	0.000E+00	1.611E-01
7.729063E+00	5.38405E+01	1.1241E+01	4.0701E+02	4.4991E+00	0.000E+00	1.604E-01
7.775484E+00	5.49428E+01	1.2884E+01	4.6372E+02	4.4763E+00	0.000E+00	1.595E-01
7.891536E+00	5.62108E+01	1.2596E+01	4.4670E+02	4.4198E+00	0.000E+00	1.571E-01
7.902609E+00	5.62920E+01	1.2569E+01	4.4513E+02	4.4145E+00	0.000E+00	1.569E-01
8.447890E+00	5.86461E+01	1.1380E+01	3.7700E+02	4.1638E+00	0.000E+00	1.468E-01
9.030794E+00	6.00049E+01	1.0264E+01	3.1809E+02	3.9193E+00	0.000E+00	1.373E-01
9.653919E+00	6.08642E+01	9.1830E+00	2.6621E+02	3.6819E+00	0.000E+00	1.284E-01
1.032004E+01	6.14251E+01	8.2105E+00	2.2266E+02	3.4522E+00	0.000E+00	1.201E-01
1.103212E+01	6.17932E+01	7.3402E+00	1.8621E+02	3.2307E+00	0.000E+00	1.124E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.179334E+01	6.20339E+01	6.5679E+00	1.5586E+02	3.0179E+00	0.000E+00	1.051E-01
1.260708E+01	6.21879E+01	5.8820E+00	1.3057E+02	2.8141E+00	0.000E+00	9.834E-02
1.347697E+01	6.23534E+01	5.2711E+00	1.0946E+02	2.6196E+00	0.000E+00	9.200E-02
1.440688E+01	6.23992E+01	4.7077E+00	9.1450E+01	2.4346E+00	0.000E+00	8.606E-02
1.540095E+01	6.24411E+01	4.2005E+00	7.6330E+01	2.2590E+00	0.000E+00	8.050E-02
1.646362E+01	6.24459E+01	3.7379E+00	6.3541E+01	2.0930E+00	0.000E+00	7.531E-02
1.759961E+01	6.23903E+01	3.3284E+00	5.2927E+01	1.9364E+00	0.000E+00	7.045E-02
1.881398E+01	6.23177E+01	2.9663E+00	4.4125E+01	1.7891E+00	0.000E+00	6.590E-02
2.011215E+01	6.22344E+01	2.6460E+00	3.6820E+01	1.6509E+00	0.000E+00	6.165E-02
2.149988E+01	6.21440E+01	2.3624E+00	3.0751E+01	1.5217E+00	0.000E+00	5.767E-02
2.298338E+01	6.20492E+01	2.1111E+00	2.5706E+01	1.4011E+00	0.000E+00	5.395E-02
2.456923E+01	6.19516E+01	1.8879E+00	2.1505E+01	1.2888E+00	0.000E+00	5.046E-02
2.626450E+01	6.18538E+01	1.6898E+00	1.8006E+01	1.1845E+00	0.000E+00	4.721E-02
2.807676E+01	6.17569E+01	1.5024E+00	1.4976E+01	1.0879E+00	0.000E+00	4.416E-02
3.001405E+01	6.16432E+01	1.3321E+00	1.2421E+01	9.9858E-01	0.000E+00	4.131E-02
3.208502E+01	6.15154E+01	1.1796E+00	1.0289E+01	9.1621E-01	0.000E+00	3.864E-02
3.429889E+01	6.13696E+01	1.0428E+00	8.5091E+00	8.4038E-01	0.000E+00	3.615E-02
3.666551E+01	6.11938E+01	9.1997E-01	7.0220E+00	7.7073E-01	0.000E+00	3.381E-02
3.919543E+01	6.09665E+01	8.1156E-01	5.7947E+00	7.0687E-01	0.000E+00	3.163E-02
4.189992E+01	6.06307E+01	7.1648E-01	4.7856E+00	6.4844E-01	0.000E+00	2.959E-02
4.479101E+01	5.99454E+01	6.3304E-01	3.9553E+00	5.9507E-01	0.000E+00	2.768E-02
4.589752E+01	5.93118E+01	6.0513E-01	3.6898E+00	5.7674E-01	0.000E+00	2.701E-02
4.660003E+01	5.81331E+01	5.8841E-01	3.5338E+00	5.6565E-01	0.000E+00	2.661E-02
4.678737E+01	5.67210E+01	5.8407E-01	3.4937E+00	5.6275E-01	0.000E+00	2.650E-02
4.706837E+01	5.81477E+01	3.3575E+00	1.9963E+01	5.5847E-01	1.653E+01	2.634E-02
4.777089E+01	5.94373E+01	3.2817E+00	1.9226E+01	5.4802E-01	1.593E+01	2.595E-02
4.788159E+01	5.95434E+01	3.2700E+00	1.9113E+01	5.4640E-01	1.584E+01	2.589E-02
5.118542E+01	6.09184E+01	2.9424E+00	1.6088E+01	5.0210E-01	1.338E+01	2.422E-02
5.471721E+01	6.14636E+01	2.6381E+00	1.3493E+01	4.6182E-01	1.125E+01	2.266E-02
5.849270E+01	6.17813E+01	2.3625E+00	1.1303E+01	4.2525E-01	9.443E+00	2.120E-02
6.252870E+01	6.19873E+01	2.1137E+00	9.4604E+00	3.9210E-01	7.917E+00	1.983E-02
6.684318E+01	6.21242E+01	1.8891E+00	7.9093E+00	3.6208E-01	6.628E+00	1.855E-02
7.145536E+01	6.22165E+01	1.6883E+00	6.6124E+00	3.3492E-01	5.548E+00	1.735E-02
7.638578E+01	6.22786E+01	1.5088E+00	5.5281E+00	3.1036E-01	4.643E+00	1.623E-02
8.165640E+01	6.23211E+01	1.3466E+00	4.6153E+00	2.8817E-01	3.881E+00	1.518E-02
8.729069E+01	6.23457E+01	1.1983E+00	3.8418E+00	2.6813E-01	3.236E+00	1.420E-02
9.331374E+01	6.23573E+01	1.0664E+00	3.1983E+00	2.5004E-01	2.699E+00	1.329E-02
9.975239E+01	6.23883E+01	9.4560E-01	2.6530E+00	2.3370E-01	2.241E+00	1.243E-02
1.066353E+02	6.23810E+01	8.3837E-01	2.2003E+00	2.1894E-01	1.860E+00	1.163E-02
1.139931E+02	6.23684E+01	7.4336E-01	1.8250E+00	2.0560E-01	1.544E+00	1.088E-02
1.218587E+02	6.23525E+01	6.5918E-01	1.5139E+00	1.9353E-01	1.281E+00	1.017E-02
1.302669E+02	6.23345E+01	5.8459E-01	1.2559E+00	1.8259E-01	1.063E+00	9.518E-03
1.392553E+02	6.23153E+01	5.1848E-01	1.0420E+00	1.7267E-01	8.826E-01	8.903E-03
1.488640E+02	6.22955E+01	4.5988E-01	8.6458E-01	1.6365E-01	7.326E-01	8.329E-03
1.591356E+02	6.22757E+01	4.0794E-01	7.1742E-01	1.5543E-01	6.080E-01	7.791E-03
1.701159E+02	6.22562E+01	3.6189E-01	5.9536E-01	1.4792E-01	5.047E-01	7.288E-03
1.818539E+02	6.22371E+01	3.2107E-01	4.9411E-01	1.4104E-01	4.189E-01	6.818E-03
1.944018E+02	6.22187E+01	2.8487E-01	4.1010E-01	1.3472E-01	3.477E-01	6.378E-03
2.078156E+02	6.22010E+01	2.5307E-01	3.4818E-01	1.2888E-01	2.890E-01	5.966E-03
2.221548E+02	6.21845E+01	2.2533E-01	2.8387E-01	1.2347E-01	2.408E-01	5.581E-03
2.374835E+02	6.21693E+01	2.0065E-01	2.3646E-01	1.1844E-01	2.007E-01	5.221E-03
2.538699E+02	6.21551E+01	1.7868E-01	1.9698E-01	1.1374E-01	1.672E-01	4.884E-03
2.713869E+02	6.21419E+01	1.5913E-01	1.6410E-01	1.0933E-01	1.393E-01	4.569E-03
2.901126E+02	6.21297E+01	1.4172E-01	1.3672E-01	1.0518E-01	1.161E-01	4.274E-03
3.101304E+02	6.21185E+01	1.2623E-01	1.1391E-01	1.0126E-01	9.677E-02	3.998E-03
3.315294E+02	6.21081E+01	1.1243E-01	9.4913E-02	9.7528E-02	8.064E-02	3.740E-03
3.544049E+02	6.20985E+01	1.0015E-01	7.9088E-02	9.3973E-02	6.720E-02	3.498E-03
3.788588E+02	6.20896E+01	8.9218E-02	6.5906E-02	9.0572E-02	5.600E-02	3.273E-03
4.050001E+02	6.20815E+01	7.9481E-02	5.4923E-02	8.7306E-02	4.667E-02	3.061E-03
4.329451E+02	6.20741E+01	7.0810E-02	4.5773E-02	8.4162E-02	3.889E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 443

Eu Z = 63

Atomic weight = 1.519600E+02 g/mol, nominal density ρ (g/cm³) = 5.2280E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.52336E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.76917E+05

λ edges. Edge energies (keV):

K		4.85190E+00	L	I	8.05200E+00	L	II	7.61710E+00	L	III	6.97690E+00
M	I	1.80000E+00	M	II	1.61390E+00	M	III	1.48060E+00	M	IV	1.16060E+00
M	V	1.33090E+00	N	I	3.60200E-00	N	II	2.83900E-00	N	III	2.56600E-01
N	IV	1.33200E-00	N	V	1.33200E-00	O	I	2.91151E-03	O	II	3.18000E-02
O	III	2.20000E-02	N	VI	2.20000E-02						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -9.5641E-01, -5.7720E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.4328E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.39833E+01	2.5065E-01	6.4928E+03	2.3138E-04	0.000E+00	1.160E+02
1.142761E-02	1.38468E+01	2.8095E-01	6.8081E+03	3.1371E-04	0.000E+00	1.085E+02
1.221612E-02	1.36829E+01	3.1548E-01	7.1513E+03	4.2314E-04	0.000E+00	1.015E+02
1.305903E-02	1.34837E+01	3.5479E-01	7.5232E+03	5.6783E-04	0.000E+00	9.494E+01
1.396010E-02	1.32373E+01	3.9950E-01	7.9247E+03	7.5814E-04	0.000E+00	8.881E+01
1.492335E-02	1.29256E+01	4.5032E-01	8.3561E+03	1.0071E-03	0.000E+00	8.308E+01
1.595306E-02	1.25184E+01	5.0798E-01	8.8177E+03	1.3312E-03	0.000E+00	7.772E+01
1.705382E-02	1.19616E+01	5.7330E-01	9.3091E+03	1.7507E-03	0.000E+00	7.270E+01
1.823053E-02	1.11444E+01	6.4715E-01	9.8300E+03	2.2911E-03	0.000E+00	6.801E+01
1.948844E-02	9.78838E+00	7.3045E-01	1.0379E+04	2.9834E-03	0.000E+00	6.362E+01
2.083314E-02	6.82187E+00	8.2418E-01	1.0955E+04	3.8660E-03	0.000E+00	5.951E+01
2.156000E-02	2.42628E+00	8.7675E-01	1.1261E+04	4.4085E-03	0.000E+00	5.751E+01
2.189000E-02	-4.57615E+00	9.0104E-01	1.1398E+04	4.6705E-03	0.000E+00	5.664E+01
2.197800E-02	-1.32262E+01	9.0756E-01	1.1435E+04	4.7421E-03	0.000E+00	5.641E+01
2.211000E-02	-3.85948E+00	1.8081E+01	2.2646E+05	4.8508E-03	0.000E+00	5.608E+01
2.227063E-02	1.46570E+00	1.7741E+01	2.2060E+05	4.9853E-03	0.000E+00	5.567E+01
2.244000E-02	4.42720E+00	1.7394E+01	2.1464E+05	5.1298E-03	0.000E+00	5.525E+01
2.380730E-02	1.32311E+01	1.4940E+01	1.7378E+05	6.3976E-03	0.000E+00	5.208E+01
2.545001E-02	1.69560E+01	1.2596E+01	1.3706E+05	8.1705E-03	0.000E+00	4.872E+01
2.720606E-02	1.88177E+01	1.0552E+01	1.0740E+05	1.0385E-02	0.000E+00	4.557E+01
2.908327E-02	1.97321E+01	8.8615E+00	8.4375E+04	1.3137E-02	0.000E+00	4.263E+01
3.109002E-02	2.01046E+01	7.5261E+00	6.7035E+04	1.6539E-02	0.000E+00	3.988E+01
3.116400E-02	2.01107E+01	7.4848E+00	6.6508E+04	1.6674E-02	0.000E+00	3.978E+01
3.164100E-02	2.01363E+01	7.2300E+00	6.3276E+04	1.7560E-02	0.000E+00	3.918E+01
3.176820E-02	2.01315E+01	7.1655E+00	6.2460E+04	1.7801E-02	0.000E+00	3.903E+01
3.195900E-02	2.01522E+01	7.0947E+00	6.1474E+04	1.8166E-02	0.000E+00	3.879E+01
3.243600E-02	2.01771E+01	6.8729E+00	5.8676E+04	1.9098E-02	0.000E+00	3.822E+01
3.323523E-02	2.01866E+01	6.5399E+00	5.4490E+04	2.0726E-02	0.000E+00	3.731E+01
3.552846E-02	2.01102E+01	5.8100E+00	4.5285E+04	2.5851E-02	0.000E+00	3.490E+01
3.797993E-02	1.99568E+01	5.3111E+00	3.8724E+04	3.2094E-02	0.000E+00	3.264E+01
4.060054E-02	1.97831E+01	5.0003E+00	3.4105E+04	3.9662E-02	0.000E+00	3.054E+01
4.340198E-02	1.96243E+01	4.8414E+00	3.0890E+04	4.8791E-02	0.000E+00	2.857E+01
4.639671E-02	1.95039E+01	4.8054E+00	2.8681E+04	5.9749E-02	0.000E+00	2.672E+01
4.959809E-02	1.94397E+01	4.8696E+00	2.7188E+04	7.2837E-02	0.000E+00	2.500E+01
5.302035E-02	1.94498E+01	5.0163E+00	2.6199E+04	8.8396E-02	0.000E+00	2.338E+01
5.667876E-02	1.95454E+01	5.1276E+00	2.5052E+04	1.0680E-01	0.000E+00	2.187E+01
6.058959E-02	1.96637E+01	5.1817E+00	2.3682E+04	1.2847E-01	0.000E+00	2.046E+01
6.477028E-02	1.97952E+01	5.2494E+00	2.2443E+04	1.5385E-01	0.000E+00	1.914E+01
6.923942E-02	1.99539E+01	5.3225E+00	2.1287E+04	1.8345E-01	0.000E+00	1.791E+01
7.401695E-02	2.01062E+01	5.3942E+00	2.0181E+04	2.1779E-01	0.000E+00	1.675E+01
7.912411E-02	2.02598E+01	5.4590E+00	1.9105E+04	2.5745E-01	0.000E+00	1.567E+01
9.665893E-02	2.06028E+01	5.5743E+00	1.5970E+04	4.1455E-01	0.000E+00	1.283E+01
1.033284E-01	2.05930E+01	5.5782E+00	1.4950E+04	4.8182E-01	0.000E+00	1.200E+01
1.104581E-01	2.04181E+01	5.5623E+00	1.3945E+04	5.5768E-01	0.000E+00	1.122E+01
1.180797E-01	1.98690E+01	5.5260E+00	1.2959E+04	6.4283E-01	0.000E+00	1.050E+01
1.262272E-01	1.80575E+01	5.4691E+00	1.1998E+04	7.3795E-01	0.000E+00	9.822E+00
1.305360E-01	1.46390E+01	5.4328E+00	1.1525E+04	7.8978E-01	0.000E+00	9.498E+00
1.325340E-01	8.01763E+00	5.4147E+00	1.1314E+04	8.1414E-01	0.000E+00	9.355E+00
8.458368E-02	2.04046E+01	5.5126E+00	1.8048E+04	3.0304E-01	0.000E+00	1.466E+01
9.041995E-02	2.05260E+01	5.5518E+00	1.7003E+04	3.5518E-01	0.000E+00	1.371E+01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.330668E-01	-1.13543E+00	5.4098E+00	1.1258E+04	8.2068E-01	0.000E+00	9.317E+00
1.338660E-01	1.05268E+01	2.3923E+01	4.9488E+04	8.3050E-01	0.000E+00	9.262E+00
1.349368E-01	1.74020E+01	2.2132E+01	4.5419E+04	8.4371E-01	0.000E+00	9.188E+00
1.358640E-01	2.04294E+01	2.0730E+01	4.2251E+04	8.5519E-01	0.000E+00	9.126E+00
1.442475E-01	2.75121E+01	1.2474E+01	2.3947E+04	9.6073E-01	0.000E+00	8.595E+00
1.542005E-01	2.73781E+01	8.5138E+00	1.5289E+04	1.0896E+00	0.000E+00	8.040E+00
1.648404E-01	2.66914E+01	7.0192E+00	1.1792E+04	1.2309E+00	0.000E+00	7.521E+00
1.762144E-01	2.62035E+01	6.3220E+00	9.9349E+03	1.3850E+00	0.000E+00	7.036E+00
1.883732E-01	2.58617E+01	5.9356E+00	8.7256E+03	1.5523E+00	0.000E+00	6.582E+00
2.013709E-01	2.55896E+01	5.6981E+00	7.8358E+03	1.7331E+00	0.000E+00	6.157E+00
2.152655E-01	2.53303E+01	5.5501E+00	7.1397E+03	1.9275E+00	0.000E+00	5.760E+00
2.301188E-01	2.50291E+01	5.4699E+00	6.5823E+03	2.1355E+00	0.000E+00	5.388E+00
2.459970E-01	2.45567E+01	5.4503E+00	6.1353E+03	2.3570E+00	0.000E+00	5.040E+00
2.514680E-01	2.42481E+01	5.4568E+00	6.0090E+03	2.4329E+00	0.000E+00	4.930E+00
2.553170E-01	2.37259E+01	5.4650E+00	5.9273E+03	2.4862E+00	0.000E+00	4.856E+00
2.563434E-01	2.31592E+01	5.4677E+00	5.9065E+03	2.5004E+00	0.000E+00	4.837E+00
2.578830E-01	2.36897E+01	6.5544E+00	7.0382E+03	2.5216E+00	0.000E+00	4.808E+00
2.617320E-01	2.41170E+01	6.5797E+00	6.9614E+03	2.5747E+00	0.000E+00	4.737E+00
2.629708E-01	2.41759E+01	6.5883E+00	6.9377E+03	2.5917E+00	0.000E+00	4.715E+00
2.782220E-01	2.43635E+01	6.7153E+00	6.6838E+03	2.7999E+00	0.000E+00	4.456E+00
2.811158E-01	2.43159E+01	6.7432E+00	6.6425E+03	2.8391E+00	0.000E+00	4.410E+00
2.824805E-01	2.42559E+01	6.7567E+00	6.6236E+03	2.8576E+00	0.000E+00	4.389E+00
2.836161E-01	2.40941E+01	6.7681E+00	6.6083E+03	2.8729E+00	0.000E+00	4.372E+00
2.853195E-01	2.42760E+01	7.1196E+00	6.9100E+03	2.8958E+00	0.000E+00	4.345E+00
2.895780E-01	2.44513E+01	7.1693E+00	6.8559E+03	2.9530E+00	0.000E+00	4.282E+00
3.005128E-01	2.46278E+01	7.3042E+00	6.7307E+03	3.0987E+00	0.000E+00	4.126E+00
3.212482E-01	2.48099E+01	7.5801E+00	6.5341E+03	3.3696E+00	0.000E+00	3.859E+00
3.434143E-01	2.49173E+01	7.8865E+00	6.3594E+03	3.6508E+00	0.000E+00	3.610E+00
3.529960E-01	2.48860E+01	8.0176E+00	6.2896E+03	3.7696E+00	0.000E+00	3.512E+00
3.583990E-01	2.47172E+01	8.0903E+00	6.2510E+03	3.8357E+00	0.000E+00	3.459E+00
3.598398E-01	2.44650E+01	8.1096E+00	6.2408E+03	3.8533E+00	0.000E+00	3.446E+00
3.620010E-01	2.47584E+01	8.6637E+00	6.6274E+03	3.8795E+00	0.000E+00	3.425E+00
3.671099E-01	2.50440E+01	8.7338E+00	6.5880E+03	3.9412E+00	0.000E+00	3.377E+00
3.674040E-01	2.50546E+01	8.7378E+00	6.5858E+03	3.9448E+00	0.000E+00	3.375E+00
3.924405E-01	2.56283E+01	9.0598E+00	6.3929E+03	4.2396E+00	0.000E+00	3.159E+00
4.195189E-01	2.60851E+01	9.3558E+00	6.1756E+03	4.5443E+00	0.000E+00	2.955E+00
4.484657E-01	2.65623E+01	9.5996E+00	5.9275E+03	4.8538E+00	0.000E+00	2.765E+00
4.794098E-01	2.70359E+01	9.7772E+00	5.6475E+03	5.1663E+00	0.000E+00	2.586E+00
5.124891E-01	2.74868E+01	9.8789E+00	5.3379E+03	5.4798E+00	0.000E+00	2.419E+00
5.478508E-01	2.78899E+01	9.8991E+00	5.0036E+03	5.7925E+00	0.000E+00	2.263E+00
5.856525E-01	2.82087E+01	9.8292E+00	4.6476E+03	6.1023E+00	0.000E+00	2.117E+00
6.260625E-01	2.83979E+01	9.6779E+00	4.2807E+03	6.4069E+00	0.000E+00	1.980E+00
6.692609E-01	2.84105E+01	9.4604E+00	3.9144E+03	6.7044E+00	0.000E+00	1.853E+00
7.154399E-01	2.81906E+01	9.1926E+00	3.5581E+03	6.9924E+00	0.000E+00	1.733E+00
7.648052E-01	2.76594E+01	8.8889E+00	3.2184E+03	7.2689E+00	0.000E+00	1.621E+00
8.175768E-01	2.66949E+01	8.5621E+00	2.9000E+03	7.5318E+00	0.000E+00	1.516E+00
8.739896E-01	2.50563E+01	8.2228E+00	2.6053E+03	7.7792E+00	0.000E+00	1.419E+00
9.342948E-01	2.22513E+01	7.8792E+00	2.3353E+03	8.0090E+00	0.000E+00	1.327E+00
9.987612E-01	1.70426E+01	7.5375E+00	2.0898E+03	8.2196E+00	0.000E+00	1.241E+00
1.067676E+00	3.06861E+00	7.0155E+00	1.8196E+03	8.4094E+00	0.000E+00	1.161E+00
1.108282E+00	-2.58482E+01	6.7342E+00	1.6826E+03	8.5060E+00	0.000E+00	1.119E+00
1.125246E+00	-8.20948E+01	6.6234E+00	1.6300E+03	8.5432E+00	0.000E+00	1.102E+00
1.129769E+00	-1.69750E+02	6.5945E+00	1.6164E+03	8.5529E+00	0.000E+00	1.097E+00
1.137388E+00	-1.90171E+01	1.6851E+02	4.1027E+04	8.5688E+00	0.000E+00	1.090E+00
1.141345E+00	1.01783E+01	1.4194E+02	3.4437E+04	8.5770E+00	0.000E+00	1.086E+00
1.153518E+00	1.87356E+01	8.4824E+01	2.0363E+04	8.6015E+00	0.000E+00	1.075E+00
1.154797E+00	1.38350E+01	8.0464E+01	1.9295E+04	8.6040E+00	0.000E+00	1.074E+00
1.159439E+00	-4.22153E+01	6.6607E+01	1.5908E+04	8.6131E+00	0.000E+00	1.069E+00
1.166403E+00	5.50266E+01	1.6397E+02	3.8927E+04	8.6265E+00	0.000E+00	1.063E+00
1.183812E+00	9.61490E+01	7.9284E+01	1.8546E+04	8.6589E+00	0.000E+00	1.047E+00
1.220098E+00	7.13950E+01	2.8096E+01	6.3767E+03	8.7211E+00	0.000E+00	1.016E+00
1.304285E+00	4.64671E+01	2.0106E+01	4.2687E+03	8.8407E+00	0.000E+00	9.506E-01
1.394281E+00	3.90677E+01	2.2058E+01	4.3809E+03	8.9351E+00	0.000E+00	8.892E-01
1.450988E+00	3.69143E+01	2.4519E+01	4.6793E+03	8.9791E+00	0.000E+00	8.545E-01
1.473197E+00	3.53536E+01	2.5474E+01	4.7884E+03	8.9935E+00	0.000E+00	8.416E-01

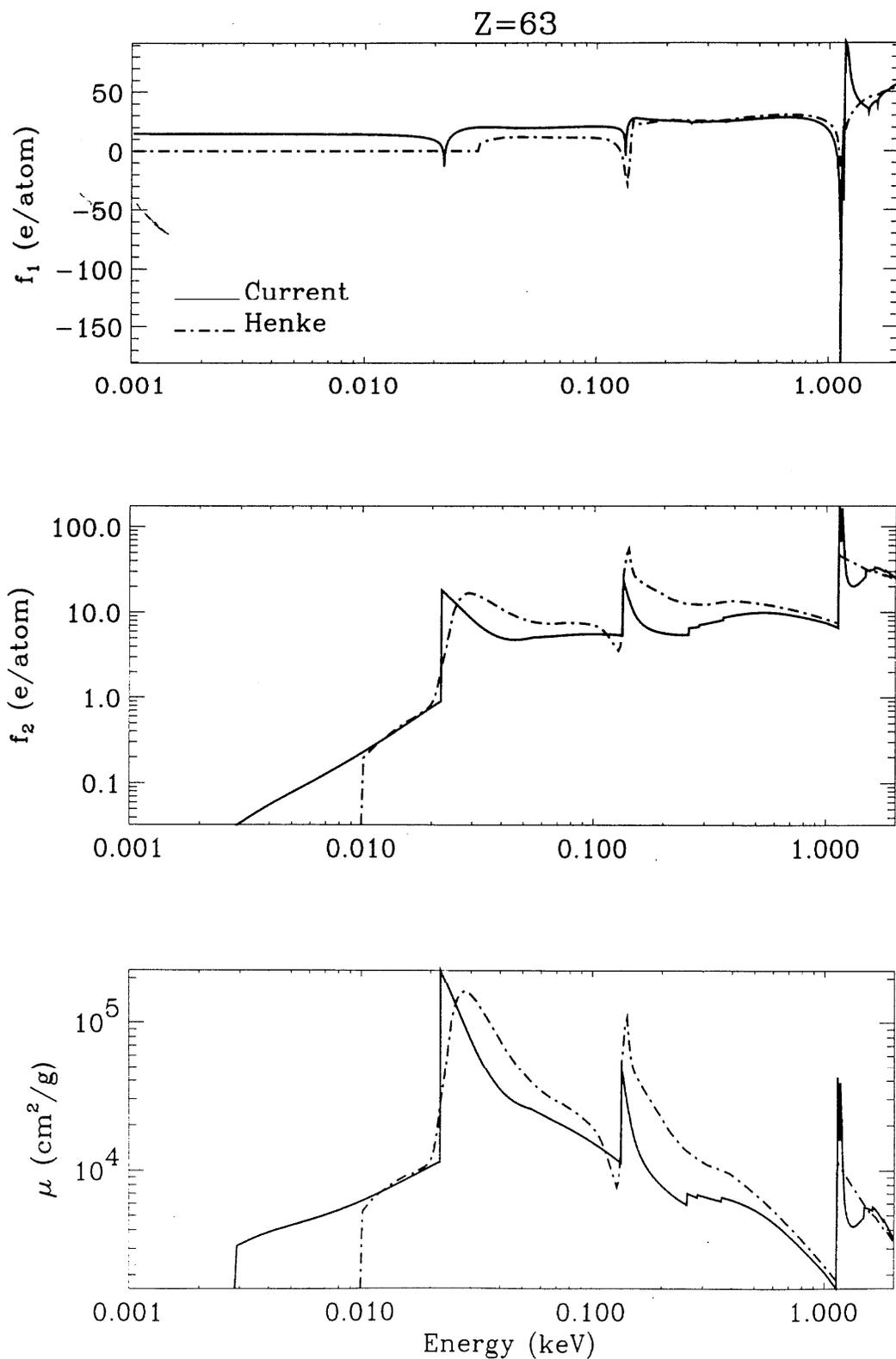
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 445

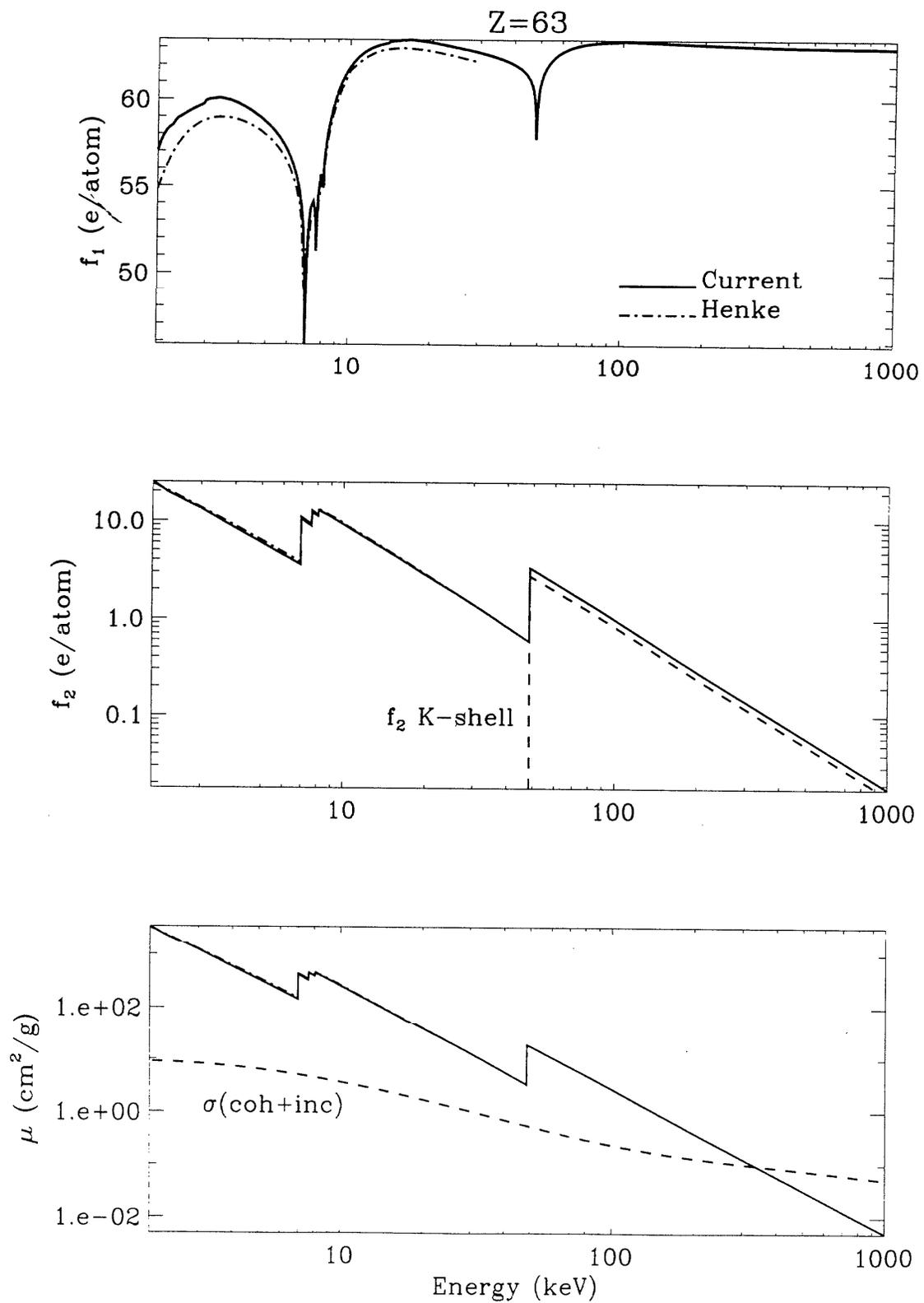
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.479119E+00	3.32177E+01	2.5640E+01	4.8003E+03	8.9970E+00	0.000E+00	8.382E-01
1.488003E+00	3.57043E+01	3.0332E+01	5.6448E+03	9.0022E+00	0.000E+00	8.332E-01
1.490486E+00	3.61884E+01	3.0384E+01	5.6451E+03	9.0036E+00	0.000E+00	8.318E-01
1.510212E+00	3.83391E+01	3.0769E+01	5.6419E+03	9.0140E+00	0.000E+00	8.210E-01
1.581622E+00	4.18196E+01	3.1298E+01	5.4798E+03	9.0425E+00	0.000E+00	7.839E-01
1.593329E+00	4.21482E+01	3.1374E+01	5.4528E+03	9.0459E+00	0.000E+00	7.781E-01
1.605830E+00	4.22449E+01	3.1448E+01	5.4230E+03	9.0492E+00	0.000E+00	7.721E-01
1.612286E+00	4.16378E+01	3.1482E+01	5.4072E+03	9.0507E+00	0.000E+00	7.690E-01
1.621969E+00	4.31025E+01	3.3348E+01	5.6935E+03	9.0528E+00	0.000E+00	7.644E-01
1.646178E+00	4.51823E+01	3.3170E+01	5.5798E+03	9.0571E+00	0.000E+00	7.532E-01
1.703269E+00	4.84459E+01	3.2230E+01	5.2399E+03	9.0620E+00	0.000E+00	7.279E-01
1.764000E+00	5.08564E+01	3.0746E+01	4.8266E+03	9.0600E+00	0.000E+00	7.029E-01
1.791000E+00	5.13630E+01	2.9991E+01	4.6370E+03	9.0569E+00	0.000E+00	6.923E-01
1.798200E+00	5.10127E+01	2.9783E+01	4.5865E+03	9.0558E+00	0.000E+00	6.895E-01
1.809000E+00	5.19754E+01	3.0645E+01	4.6911E+03	9.0541E+00	0.000E+00	6.854E-01
1.820795E+00	5.26682E+01	3.0291E+01	4.6609E+03	9.0520E+00	0.000E+00	6.809E-01
1.836000E+00	5.33286E+01	2.9831E+01	4.4993E+03	9.0489E+00	0.000E+00	6.753E-01
1.946430E+00	5.62383E+01	2.6536E+01	3.7753E+03	9.0162E+00	0.000E+00	6.370E-01
2.080733E+00	5.78198E+01	2.3062E+01	3.0692E+03	8.9553E+00	0.000E+00	5.959E-01
2.224304E+00	5.84418E+01	2.0244E+01	2.5204E+03	8.8700E+00	0.000E+00	5.574E-01
2.377781E+00	5.89433E+01	1.8268E+01	2.1275E+03	8.7613E+00	0.000E+00	5.214E-01
2.541848E+00	5.92234E+01	1.6657E+01	1.8147E+03	8.6304E+00	0.000E+00	4.878E-01
2.717235E+00	5.94751E+01	1.5180E+01	1.5470E+03	8.4786E+00	0.000E+00	4.563E-01
2.904724E+00	5.96980E+01	1.3858E+01	1.3211E+03	8.3073E+00	0.000E+00	4.268E-01
3.105150E+00	6.00036E+01	1.2554E+01	1.1195E+03	8.1180E+00	0.000E+00	3.993E-01
3.319406E+00	6.00675E+01	1.1287E+01	9.4160E+02	7.9125E+00	0.000E+00	3.735E-01
3.548445E+00	5.99841E+01	1.0151E+01	7.9220E+02	7.6925E+00	0.000E+00	3.494E-01
3.793288E+00	5.98503E+01	9.1363E+00	6.6697E+02	7.4597E+00	0.000E+00	3.269E-01
4.055024E+00	5.96358E+01	8.2325E+00	5.6220E+02	7.2158E+00	0.000E+00	3.058E-01
4.334821E+00	5.93705E+01	7.4286E+00	4.7455E+02	6.9628E+00	0.000E+00	2.860E-01
4.633924E+00	5.90558E+01	6.7125E+00	4.0113E+02	6.7024E+00	0.000E+00	2.676E-01
4.953664E+00	5.86852E+01	6.0676E+00	3.3919E+02	6.4363E+00	0.000E+00	2.503E-01
5.295467E+00	5.82226E+01	5.4616E+00	2.8560E+02	6.1662E+00	0.000E+00	2.341E-01
5.660855E+00	5.76151E+01	4.9205E+00	2.4070E+02	5.8937E+00	0.000E+00	2.190E-01
6.051453E+00	5.67667E+01	4.4412E+00	2.0323E+02	5.6205E+00	0.000E+00	2.049E-01
6.469004E+00	5.53693E+01	4.0134E+00	1.7180E+02	5.3479E+00	0.000E+00	1.917E-01
6.837362E+00	5.24608E+01	3.6797E+00	1.4903E+02	5.1231E+00	0.000E+00	1.813E-01
6.915365E+00	5.06522E+01	3.6152E+00	1.4477E+02	5.0773E+00	0.000E+00	1.793E-01
6.942016E+00	4.94006E+01	3.5936E+00	1.4335E+02	5.0618E+00	0.000E+00	1.786E-01
6.969923E+00	4.58346E+01	3.5713E+00	1.4189E+02	5.0456E+00	0.000E+00	1.779E-01
7.011785E+00	4.93893E+01	1.0485E+01	4.1410E+02	5.0215E+00	0.000E+00	1.768E-01
7.116438E+00	5.24556E+01	1.0149E+01	3.9493E+02	4.9620E+00	0.000E+00	1.742E-01
7.392525E+00	5.41115E+01	9.3669E+00	3.5088E+02	4.8100E+00	0.000E+00	1.677E-01
7.464758E+00	5.40325E+01	9.2026E+00	3.4138E+02	4.7714E+00	0.000E+00	1.661E-01
7.579014E+00	5.29494E+01	8.9580E+00	3.2730E+02	4.7113E+00	0.000E+00	1.636E-01
7.609483E+00	5.12685E+01	8.8957E+00	3.2372E+02	4.6954E+00	0.000E+00	1.629E-01
7.655185E+00	5.31756E+01	1.2274E+01	4.4399E+02	4.6718E+00	0.000E+00	1.620E-01
7.769442E+00	5.49778E+01	1.1938E+01	4.2549E+02	4.6136E+00	0.000E+00	1.596E-01
7.890960E+00	5.56937E+01	1.1599E+01	4.0705E+02	4.5529E+00	0.000E+00	1.571E-01
7.902609E+00	5.57303E+01	1.1568E+01	4.0535E+02	4.5471E+00	0.000E+00	1.569E-01
8.011740E+00	5.56299E+01	1.1284E+01	3.9001E+02	4.4937E+00	0.000E+00	1.548E-01
8.043948E+00	5.48926E+01	1.1207E+01	3.8582E+02	4.4781E+00	0.000E+00	1.541E-01
8.092260E+00	5.59907E+01	1.2844E+01	4.3952E+02	4.4549E+00	0.000E+00	1.532E-01
8.213040E+00	5.72565E+01	1.2562E+01	4.2354E+02	4.3977E+00	0.000E+00	1.510E-01
8.447890E+00	5.85224E+01	1.2052E+01	3.9505E+02	4.2897E+00	0.000E+00	1.468E-01
9.030794E+00	6.03515E+01	1.0886E+01	3.3379E+02	4.0386E+00	0.000E+00	1.373E-01
9.653919E+00	6.14328E+01	9.7453E+00	2.7954E+02	3.7947E+00	0.000E+00	1.284E-01
1.032004E+01	6.21312E+01	8.7220E+00	2.3404E+02	3.5586E+00	0.000E+00	1.201E-01
1.103212E+01	6.25970E+01	7.7991E+00	1.9576E+02	3.3309E+00	0.000E+00	1.124E-01
1.179334E+01	6.29021E+01	6.9771E+00	1.6383E+02	3.1121E+00	0.000E+00	1.051E-01
1.260708E+01	6.31004E+01	6.2471E+00	1.3722E+02	2.9025E+00	0.000E+00	9.834E-02
1.347697E+01	6.32258E+01	5.5984E+00	1.1503E+02	2.7024E+00	0.000E+00	9.200E-02
1.440688E+01	6.33696E+01	5.0106E+00	9.6310E+01	2.5119E+00	0.000E+00	8.606E-02
1.540095E+01	6.34331E+01	4.4768E+00	8.0495E+01	2.3312E+00	0.000E+00	8.050E-02
1.646362E+01	6.34567E+01	3.9915E+00	6.7136E+01	2.1602E+00	0.000E+00	7.531E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.759961E+01	6.34161E+01	3.5544E+00	5.5926E+01	1.9988E+00	0.000E+00	7.045E-02
1.881398E+01	6.33537E+01	3.1680E+00	4.6628E+01	1.8471E+00	0.000E+00	6.590E-02
2.011215E+01	6.32776E+01	2.8261E+00	3.8911E+01	1.7046E+00	0.000E+00	6.165E-02
2.149988E+01	6.31925E+01	2.5233E+00	3.2500E+01	1.5713E+00	0.000E+00	5.767E-02
2.298338E+01	6.31018E+01	2.2550E+00	2.7169E+01	1.4469E+00	0.000E+00	5.395E-02
2.456923E+01	6.30078E+01	2.0169E+00	2.2733E+01	1.3311E+00	0.000E+00	5.046E-02
2.626450E+01	6.29135E+01	1.8054E+00	1.9035E+01	1.2234E+00	0.000E+00	4.721E-02
2.807676E+01	6.28223E+01	1.6051E+00	1.5831E+01	1.1237E+00	0.000E+00	4.416E-02
3.001405E+01	6.27126E+01	1.4248E+00	1.3145E+01	1.0314E+00	0.000E+00	4.131E-02
3.208502E+01	6.25915E+01	1.2627E+00	1.0898E+01	9.4633E-01	0.000E+00	3.864E-02
3.429889E+01	6.24558E+01	1.1186E+00	9.0314E+00	8.6796E-01	0.000E+00	3.615E-02
3.666551E+01	6.22983E+01	9.8790E-01	7.4611E+00	7.9594E-01	0.000E+00	3.381E-02
3.919543E+01	6.21028E+01	8.7194E-01	6.1603E+00	7.2990E-01	0.000E+00	3.163E-02
4.189992E+01	6.18370E+01	7.6975E-01	5.0873E+00	6.6944E-01	0.000E+00	2.959E-02
4.479101E+01	6.13990E+01	6.8007E-01	4.2045E+00	6.1420E-01	0.000E+00	2.768E-02
4.754862E+01	6.03280E+01	6.0908E-01	3.5472E+00	5.6886E-01	0.000E+00	2.608E-02
4.788159E+01	5.99783E+01	6.0131E-01	3.4776E+00	5.6380E-01	0.000E+00	2.589E-02
4.827641E+01	5.91554E+01	5.9230E-01	3.3975E+00	5.5792E-01	0.000E+00	2.568E-02
4.847048E+01	5.77507E+01	5.8795E-01	3.3590E+00	5.5507E-01	0.000E+00	2.558E-02
4.876160E+01	5.91703E+01	3.3470E+00	1.9008E+01	5.5085E-01	1.571E+01	2.543E-02
4.948938E+01	6.04533E+01	3.2710E+00	1.8303E+01	5.4055E-01	1.514E+01	2.505E-02
5.118542E+01	6.14212E+01	3.1039E+00	1.6792E+01	5.1791E-01	1.391E+01	2.422E-02
5.471721E+01	6.22220E+01	2.7859E+00	1.4099E+01	4.7617E-01	1.171E+01	2.266E-02
5.849270E+01	6.26336E+01	2.4966E+00	1.1819E+01	4.3827E-01	9.843E+00	2.120E-02
6.252870E+01	6.28888E+01	2.2360E+00	9.9026E+00	4.0390E-01	8.263E+00	1.983E-02
6.684318E+01	6.30578E+01	1.9997E+00	8.2843E+00	3.7276E-01	6.923E+00	1.855E-02
7.145536E+01	6.31711E+01	1.7878E+00	6.9285E+00	3.4457E-01	5.797E+00	1.735E-02
7.638578E+01	6.32479E+01	1.5984E+00	5.7946E+00	3.1909E-01	4.854E+00	1.623E-02
8.165640E+01	6.33021E+01	1.4271E+00	4.8396E+00	2.9605E-01	4.059E+00	1.518E-02
8.729069E+01	6.33337E+01	1.2703E+00	4.0300E+00	2.7524E-01	3.387E+00	1.420E-02
9.331374E+01	6.33506E+01	1.1309E+00	3.3562E+00	2.5645E-01	2.826E+00	1.329E-02
9.975239E+01	6.33867E+01	1.0053E+00	2.7907E+00	2.3947E-01	2.353E+00	1.243E-02
1.066353E+02	6.33832E+01	8.9153E-01	2.3152E+00	2.2413E-01	1.953E+00	1.163E-02
1.139931E+02	6.33731E+01	7.9073E-01	1.9209E+00	2.1027E-01	1.622E+00	1.088E-02
1.218587E+02	6.33589E+01	7.0139E-01	1.5939E+00	1.9773E-01	1.347E+00	1.017E-02
1.302669E+02	6.33420E+01	6.2220E-01	1.3227E+00	1.8637E-01	1.118E+00	9.518E-03
1.392553E+02	6.33234E+01	5.5201E-01	1.0977E+00	1.7606E-01	9.282E-01	8.903E-03
1.488640E+02	6.33040E+01	4.8977E-01	9.1107E-01	1.6670E-01	7.707E-01	8.329E-03
1.591356E+02	6.32843E+01	4.3458E-01	7.5623E-01	1.5816E-01	6.399E-01	7.791E-03
1.701159E+02	6.32647E+01	3.8565E-01	6.2776E-01	1.5038E-01	5.313E-01	7.288E-03
1.818539E+02	6.32454E+01	3.4225E-01	5.2115E-01	1.4324E-01	4.411E-01	6.818E-03
1.944018E+02	6.32268E+01	3.0375E-01	4.3268E-01	1.3669E-01	3.662E-01	6.378E-03
2.078156E+02	6.32088E+01	2.6961E-01	3.5926E-01	1.3065E-01	3.041E-01	5.966E-03
2.221548E+02	6.31916E+01	2.4007E-01	2.9925E-01	1.2506E-01	2.534E-01	5.581E-03
2.374835E+02	6.31759E+01	2.1392E-01	2.4945E-01	1.1987E-01	2.113E-01	5.221E-03
2.538699E+02	6.31612E+01	1.9064E-01	2.0795E-01	1.1503E-01	1.763E-01	4.884E-03
2.713869E+02	6.31477E+01	1.6990E-01	1.7336E-01	1.1050E-01	1.470E-01	4.569E-03
2.901126E+02	6.31351E+01	1.5143E-01	1.4454E-01	1.0623E-01	1.226E-01	4.274E-03
3.101304E+02	6.31234E+01	1.3497E-01	1.2051E-01	1.0221E-01	1.023E-01	3.998E-03
3.315294E+02	6.31127E+01	1.2031E-01	1.0049E-01	9.8395E-02	8.528E-02	3.740E-03
3.544049E+02	6.31028E+01	1.0724E-01	8.3796E-02	9.4765E-02	7.112E-02	3.498E-03
3.788588E+02	6.30936E+01	9.5604E-02	6.9879E-02	9.1299E-02	5.932E-02	3.273E-03
4.050001E+02	6.30852E+01	8.5233E-02	5.8277E-02	8.7978E-02	4.947E-02	3.061E-03
4.329451E+02	6.30775E+01	7.5990E-02	4.8604E-02	8.4786E-02	4.126E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 449

Gd Z = 64

Atomic weight = 1.572500E+02 g/mol, nominal density ρ (g/cm³) = 7.8770E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.61120E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.67601E+05

19 edges. Edge energies (keV):

K		5.02391E+00	L	I	8.37560E+00	L	II	7.93030E+00	L	III	7.24280E+00
M	I	1.88080E+00	M	II	1.68830E+00	M	III	1.54400E+00	M	IV	1.21720E+00
M	V	1.18520E+00	N	I	3.75800E-00	N	II	2.88500E-00	N	III	2.70900E-01
N	IV	1.40500E-00	N	V	1.40500E-00	O	I	9.27940E-03	O	II	8.52419E-03
O	III	3.61000E-02	N	VI	2.03000E-02	N	VII	2.03000E-02			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -9.9598E-01, -6.0000E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.4289E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
8.353710E-03	1.32097E+01	0.0000E+00	0.0000E+00	8.0877E-05	0.000E+00	1.484E+02
8.481573E-03	1.31819E+01	0.0000E+00	0.0000E+00	8.7032E-05	0.000E+00	1.462E+02
8.515670E-03	1.31665E+01	0.0000E+00	0.0000E+00	8.8730E-05	0.000E+00	1.456E+02
8.566815E-03	1.31686E+01	1.9667E-02	6.1434E+02	9.1324E-05	0.000E+00	1.447E+02
8.694678E-03	1.31559E+01	1.9324E-02	5.9476E+02	9.8053E-05	0.000E+00	1.426E+02
9.093814E-03	1.30748E+01	1.8323E-02	5.3918E+02	1.2143E-04	0.000E+00	1.363E+02
9.233005E-03	1.30083E+01	1.7996E-02	5.2158E+02	1.3048E-04	0.000E+00	1.343E+02
9.270123E-03	1.29446E+01	1.7910E-02	5.1702E+02	1.3297E-04	0.000E+00	1.337E+02
9.325799E-03	1.29986E+01	1.3389E-01	3.8419E+03	1.3678E-04	0.000E+00	1.329E+02
9.464990E-03	1.30338E+01	1.3155E-01	3.7193E+03	1.4664E-04	0.000E+00	1.310E+02
1.069000E-02	1.29235E+01	1.1642E-01	2.9142E+03	2.5735E-04	0.000E+00	1.160E+02
1.142761E-02	1.27999E+01	1.1490E-01	2.6906E+03	3.4778E-04	0.000E+00	1.085E+02
1.221612E-02	1.26419E+01	1.1823E-01	2.5900E+03	4.6760E-04	0.000E+00	1.015E+02
1.305903E-02	1.24423E+01	1.2603E-01	2.5827E+03	6.2552E-04	0.000E+00	9.494E+01
1.396010E-02	1.21876E+01	1.3838E-01	2.6525E+03	8.3259E-04	0.000E+00	8.881E+01
1.492335E-02	1.18541E+01	1.5668E-01	2.7917E+03	1.1027E-03	0.000E+00	8.308E+01
1.595306E-02	1.13991E+01	1.7868E-01	2.9972E+03	1.4532E-03	0.000E+00	7.772E+01
1.705382E-02	1.07332E+01	2.0836E-01	3.2694E+03	1.9056E-03	0.000E+00	7.270E+01
1.823053E-02	9.62346E+00	2.4598E-01	3.6107E+03	2.4867E-03	0.000E+00	6.801E+01
1.948844E-02	7.04472E+00	2.9310E-01	4.0247E+03	3.2291E-03	0.000E+00	6.362E+01
1.989400E-02	4.95758E+00	3.0984E-01	4.1678E+03	3.4969E-03	0.000E+00	6.232E+01
2.019850E-02	5.08358E-01	3.2291E-01	4.2781E+03	3.7074E-03	0.000E+00	6.138E+01
2.027970E-02	-4.87034E+00	3.2647E-01	4.3079E+03	3.7649E-03	0.000E+00	6.114E+01
2.040150E-02	7.85012E-01	1.0947E+01	1.4359E+05	3.8523E-03	0.000E+00	6.077E+01
2.070600E-02	5.76199E+00	1.0710E+01	1.3842E+05	4.0767E-03	0.000E+00	5.988E+01
2.083314E-02	6.77123E+00	1.0614E+01	1.3634E+05	4.1729E-03	0.000E+00	5.951E+01
2.227063E-02	1.17709E+01	9.6389E+00	1.1582E+05	5.3667E-03	0.000E+00	5.567E+01
2.380730E-02	1.40334E+01	8.6774E+00	9.7536E+04	6.8689E-03	0.000E+00	5.208E+01
2.545001E-02	1.53779E+01	7.6765E+00	8.0717E+04	8.7500E-03	0.000E+00	4.872E+01
2.720606E-02	1.61513E+01	6.7379E+00	6.6274E+04	1.1093E-02	0.000E+00	4.557E+01
2.908327E-02	1.64765E+01	5.9222E+00	5.4491E+04	1.3999E-02	0.000E+00	4.263E+01
3.109002E-02	1.66427E+01	5.2582E+00	4.5259E+04	1.7582E-02	0.000E+00	3.988E+01
3.323523E-02	1.66450E+01	4.7528E+00	3.8268E+04	2.1981E-02	0.000E+00	3.731E+01
3.537800E-02	1.65486E+01	4.4181E+00	3.3419E+04	2.6980E-02	0.000E+00	3.505E+01
3.552846E-02	1.65385E+01	4.4000E+00	3.3141E+04	2.7354E-02	0.000E+00	3.490E+01
3.591950E-02	1.65057E+01	4.3559E+00	3.2451E+04	2.8340E-02	0.000E+00	3.452E+01
3.606390E-02	1.64811E+01	4.3406E+00	3.2208E+04	2.8710E-02	0.000E+00	3.438E+01
3.628050E-02	1.64852E+01	4.3514E+00	3.2095E+04	2.9270E-02	0.000E+00	3.417E+01
3.682200E-02	1.64682E+01	4.3032E+00	3.1273E+04	3.0697E-02	0.000E+00	3.367E+01
3.797993E-02	1.64096E+01	4.2232E+00	2.9756E+04	3.3884E-02	0.000E+00	3.264E+01
4.060054E-02	1.62666E+01	4.1376E+00	2.7272E+04	4.1782E-02	0.000E+00	3.054E+01
4.340198E-02	1.61333E+01	4.1554E+00	2.5621E+04	5.1289E-02	0.000E+00	2.857E+01
4.639671E-02	1.60235E+01	4.2536E+00	2.4533E+04	6.2677E-02	0.000E+00	2.672E+01
4.959809E-02	1.59462E+01	4.4190E+00	2.3842E+04	7.6251E-02	0.000E+00	2.500E+01
5.302035E-02	1.59079E+01	4.6376E+00	2.3407E+04	9.2355E-02	0.000E+00	2.338E+01
5.667876E-02	1.59114E+01	4.8971E+00	2.3121E+04	1.1137E-01	0.000E+00	2.187E+01
6.058959E-02	1.59574E+01	5.1869E+00	2.2909E+04	1.3371E-01	0.000E+00	2.046E+01
6.477028E-02	1.60625E+01	5.4977E+00	2.2714E+04	1.5983E-01	0.000E+00	1.914E+01
6.923942E-02	1.61889E+01	5.8218E+00	2.2501E+04	1.9024E-01	0.000E+00	1.791E+01
7.401693E-02	1.63506E+01	6.1529E+00	2.2245E+04	2.2546E-01	0.000E+00	1.675E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
7.912411E-02	1.65431E+01	6.4858E+00	2.1935E+04	2.6606E-01	0.000E+00	1.567E+01
8.458368E-02	1.67603E+01	6.8167E+00	2.1566E+04	3.1266E-01	0.000E+00	1.466E+01
9.041995E-02	1.69955E+01	7.1432E+00	2.1141E+04	3.6587E-01	0.000E+00	1.371E+01
9.665893E-02	1.72392E+01	7.4631E+00	2.0662E+04	4.2636E-01	0.000E+00	1.283E+01
1.033284E-01	1.74773E+01	7.7753E+00	2.0137E+04	4.9479E-01	0.000E+00	1.200E+01
1.104581E-01	1.76860E+01	8.0793E+00	1.9573E+04	5.7186E-01	0.000E+00	1.122E+01
1.180797E-01	1.78127E+01	8.3754E+00	1.8981E+04	6.5823E-01	0.000E+00	1.050E+01
1.262272E-01	1.77150E+01	8.6645E+00	1.8369E+04	7.5458E-01	0.000E+00	9.822E+00
1.349368E-01	1.66800E+01	8.9481E+00	1.7745E+04	8.6156E-01	0.000E+00	9.188E+00
1.376900E-01	1.54327E+01	9.0330E+00	1.7556E+04	8.9614E-01	0.000E+00	9.005E+00
1.397975E-01	1.21099E+01	9.0967E+00	1.7413E+04	9.2283E-01	0.000E+00	8.869E+00
1.403595E-01	7.55155E+00	9.1135E+00	1.7375E+04	9.2998E-01	0.000E+00	8.833E+00
1.412025E-01	1.31780E+01	1.8379E+01	3.4831E+04	9.4073E-01	0.000E+00	8.781E+00
1.433100E-01	1.81249E+01	1.7223E+01	3.2160E+04	9.6773E-01	0.000E+00	8.651E+00
1.442475E-01	1.91581E+01	1.6767E+01	3.1105E+04	9.7979E-01	0.000E+00	8.595E+00
1.542005E-01	2.29164E+01	1.3495E+01	2.3420E+04	1.1098E+00	0.000E+00	8.040E+00
1.648404E-01	2.36122E+01	1.2083E+01	1.9615E+04	1.2522E+00	0.000E+00	7.521E+00
1.762144E-01	2.40882E+01	1.1507E+01	1.7475E+04	1.4073E+00	0.000E+00	7.036E+00
1.883732E-01	2.45395E+01	1.0862E+01	1.5430E+04	1.5756E+00	0.000E+00	6.582E+00
2.013709E-01	2.49021E+01	1.0369E+01	1.3780E+04	1.7571E+00	0.000E+00	6.157E+00
2.152655E-01	2.51789E+01	9.9621E+00	1.2384E+04	1.9521E+00	0.000E+00	5.760E+00
2.301188E-01	2.53565E+01	9.6158E+00	1.1182E+04	2.1606E+00	0.000E+00	5.388E+00
2.459970E-01	2.53982E+01	9.3247E+00	1.0144E+04	2.3824E+00	0.000E+00	5.040E+00
2.629708E-01	2.51229E+01	9.0893E+00	9.2493E+03	2.6171E+00	0.000E+00	4.715E+00
2.654820E-01	2.49954E+01	9.0604E+00	9.1327E+03	2.6516E+00	0.000E+00	4.670E+00
2.695455E-01	2.44999E+01	9.0167E+00	8.9517E+03	2.7072E+00	0.000E+00	4.600E+00
2.706291E-01	2.39120E+01	9.0056E+00	8.9049E+03	2.7220E+00	0.000E+00	4.581E+00
2.722545E-01	2.44988E+01	1.0141E+01	9.9678E+03	2.7442E+00	0.000E+00	4.554E+00
2.763180E-01	2.50022E+01	1.0115E+01	9.7957E+03	2.7995E+00	0.000E+00	4.487E+00
2.811158E-01	2.52137E+01	1.0088E+01	9.6030E+03	2.8644E+00	0.000E+00	4.410E+00
2.827300E-01	2.52517E+01	1.0080E+01	9.5406E+03	2.8862E+00	0.000E+00	4.385E+00
2.870575E-01	2.52427E+01	1.0061E+01	9.3788E+03	2.9444E+00	0.000E+00	4.319E+00
2.882115E-01	2.50979E+01	1.0056E+01	9.3370E+03	2.9599E+00	0.000E+00	4.302E+00
2.899425E-01	2.53206E+01	1.0397E+01	9.5961E+03	2.9831E+00	0.000E+00	4.276E+00
2.942700E-01	2.55773E+01	1.0388E+01	9.4466E+03	3.0408E+00	0.000E+00	4.213E+00
3.005128E-01	2.57883E+01	1.0380E+01	9.2432E+03	3.1236E+00	0.000E+00	4.126E+00
3.212482E-01	2.62389E+01	1.0387E+01	8.6528E+03	3.3938E+00	0.000E+00	3.859E+00
3.434143E-01	2.65721E+01	1.0436E+01	8.1321E+03	3.6742E+00	0.000E+00	3.610E+00
3.671099E-01	2.67573E+01	1.0511E+01	7.6617E+03	3.9634E+00	0.000E+00	3.377E+00
3.682840E-01	2.67523E+01	1.0515E+01	7.6402E+03	3.9775E+00	0.000E+00	3.367E+00
3.739210E-01	2.66102E+01	1.0534E+01	7.5386E+03	4.0445E+00	0.000E+00	3.316E+00
3.754242E-01	2.63616E+01	1.0539E+01	7.5120E+03	4.0623E+00	0.000E+00	3.303E+00
3.776790E-01	2.66708E+01	1.1080E+01	7.8507E+03	4.0889E+00	0.000E+00	3.283E+00
3.833160E-01	2.69981E+01	1.1102E+01	7.7505E+03	4.1549E+00	0.000E+00	3.235E+00
3.924405E-01	2.72830E+01	1.1136E+01	7.5935E+03	4.2603E+00	0.000E+00	3.159E+00
4.195189E-01	2.78905E+01	1.1223E+01	7.1589E+03	4.5634E+00	0.000E+00	2.955E+00
4.484657E-01	2.84281E+01	1.1280E+01	6.7309E+03	4.8710E+00	0.000E+00	2.765E+00
4.794098E-01	2.89548E+01	1.1291E+01	6.3027E+03	5.1813E+00	0.000E+00	2.586E+00
5.124891E-01	2.94519E+01	1.1246E+01	5.8724E+03	5.4926E+00	0.000E+00	2.419E+00
5.478508E-01	2.99015E+01	1.1140E+01	5.4413E+03	5.8027E+00	0.000E+00	2.263E+00
5.856525E-01	3.02803E+01	1.0968E+01	5.0114E+03	6.1098E+00	0.000E+00	2.117E+00
6.260625E-01	3.05533E+01	1.0726E+01	4.5845E+03	6.4116E+00	0.000E+00	1.980E+00
6.692609E-01	3.06801E+01	1.0425E+01	4.1685E+03	6.7061E+00	0.000E+00	1.853E+00
7.154399E-01	3.06171E+01	1.0081E+01	3.7705E+03	6.9912E+00	0.000E+00	1.733E+00
7.648052E-01	3.03084E+01	9.7058E+00	3.3960E+03	7.2646E+00	0.000E+00	1.621E+00
8.175768E-01	2.96743E+01	9.3132E+00	3.0483E+03	7.5245E+00	0.000E+00	1.516E+00
8.739896E-01	2.85707E+01	8.9133E+00	2.7291E+03	7.7689E+00	0.000E+00	1.419E+00
9.342948E-01	2.67334E+01	8.5141E+00	2.4386E+03	7.9959E+00	0.000E+00	1.327E+00
9.987612E-01	2.35852E+01	8.1218E+00	2.1761E+03	8.2037E+00	0.000E+00	1.241E+00
1.067676E+00	1.69572E+01	7.5458E+00	1.8913E+03	8.3909E+00	0.000E+00	1.161E+00
1.141345E+00	-3.85147E+00	6.9966E+00	1.6404E+03	8.5560E+00	0.000E+00	1.086E+00
1.161496E+00	-2.18103E+01	6.8582E+00	1.5801E+03	8.5955E+00	0.000E+00	1.067E+00
1.179274E+00	-7.60622E+00	6.7390E+00	1.5292E+03	8.6285E+00	0.000E+00	1.051E+00
1.184015E+00	-1.60885E+02	6.7080E+00	1.5161E+03	8.6370E+00	0.000E+00	1.047E+00
1.191126E+00	-2.39861E+01	1.6970E+02	3.8124E+04	8.6495E+00	0.000E+00	1.041E+00

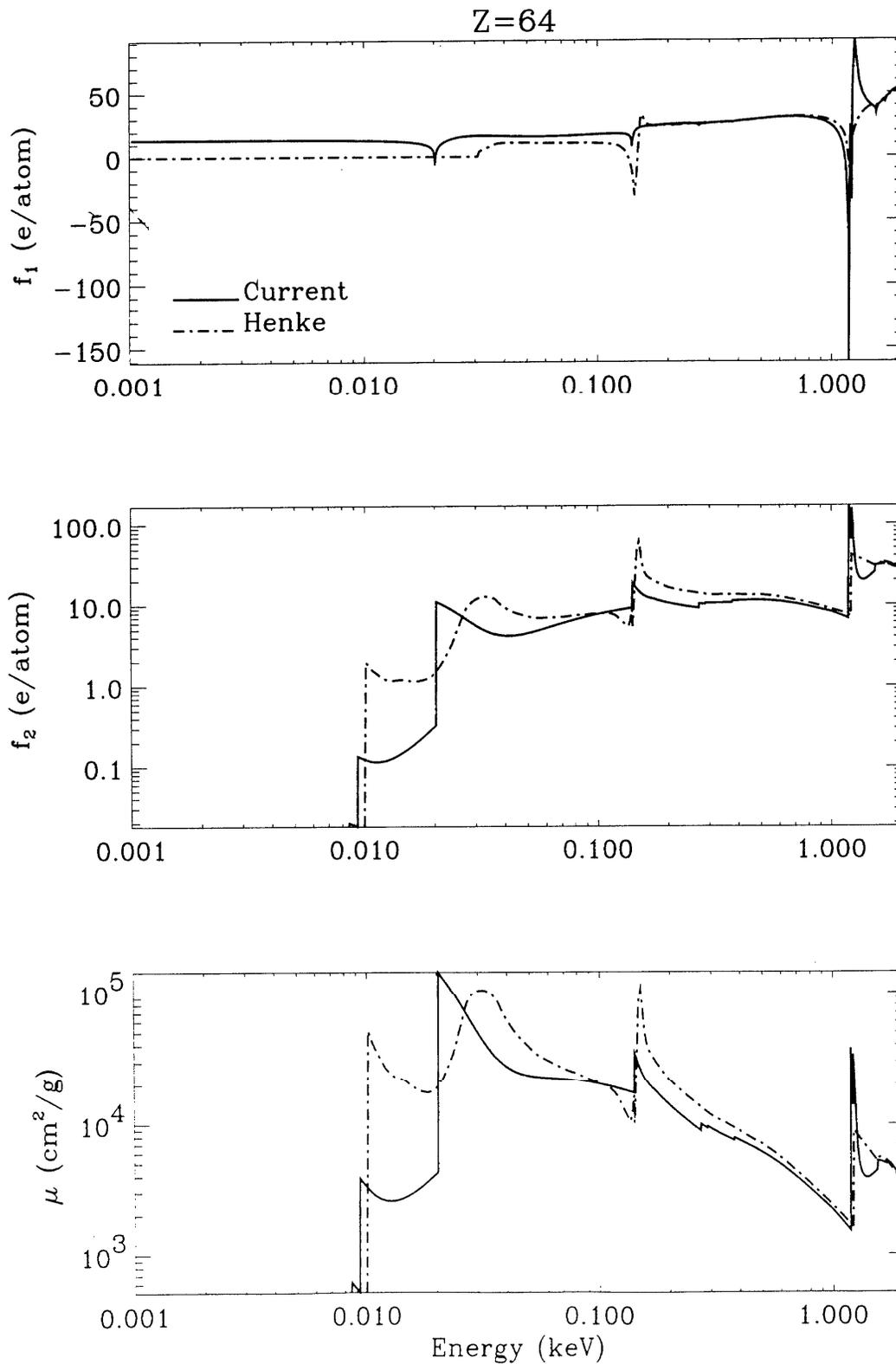
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 451

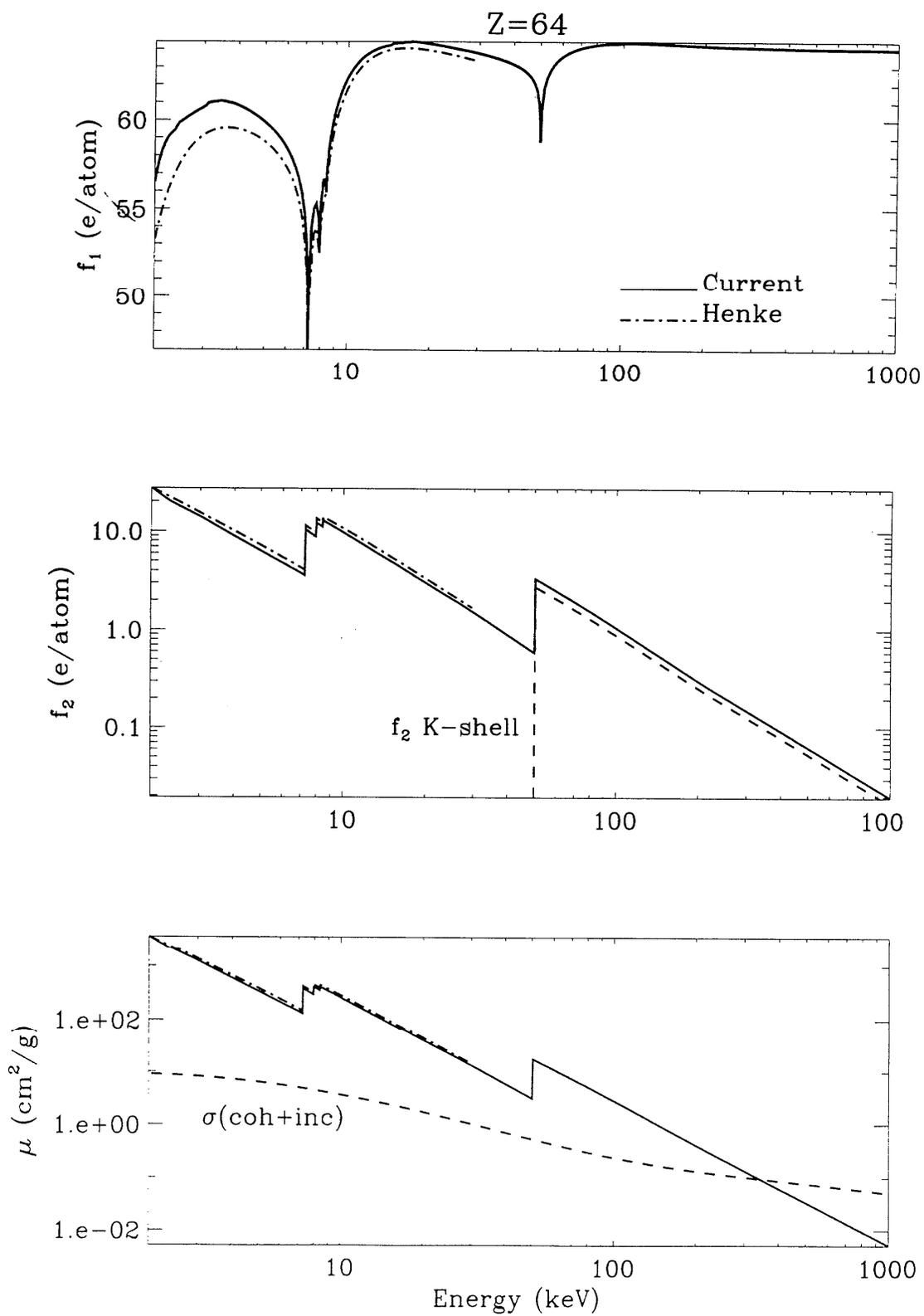
TABLE 1: Form factors, attenuation and-scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.192856E+00	-6.68539E+00	1.5795E+02	3.5434E+04	8.6525E+00	0.000E+00	1.039E+00
1.208904E+00	2.52985E+01	8.2601E+01	1.8284E+04	8.6797E+00	0.000E+00	1.026E+00
1.211114E+00	1.82949E+01	7.5764E+01	1.6740E+04	8.6833E+00	0.000E+00	1.024E+00
1.215983E+00	-3.44186E+01	6.2818E+01	1.3824E+04	8.6912E+00	0.000E+00	1.020E+00
1.220098E+00	1.96223E+01	1.7499E+02	3.8380E+04	8.6978E+00	0.000E+00	1.016E+00
1.223286E+00	5.55546E+01	1.5387E+02	3.3661E+04	8.7029E+00	0.000E+00	1.014E+00
1.241544E+00	9.37459E+01	7.5339E+01	1.6239E+04	8.7309E+00	0.000E+00	9.986E-01
1.304285E+00	5.98379E+01	2.2734E+01	4.6644E+03	8.8154E+00	0.000E+00	9.506E-01
1.394281E+00	4.45259E+01	2.0122E+01	3.8620E+03	8.9080E+00	0.000E+00	8.892E-01
1.490486E+00	3.89894E+01	2.3063E+01	4.1408E+03	8.9750E+00	0.000E+00	8.318E-01
1.513120E+00	3.81478E+01	2.4018E+01	4.2477E+03	8.9866E+00	0.000E+00	8.194E-01
1.536280E+00	3.64678E+01	2.5010E+01	4.3564E+03	8.9969E+00	0.000E+00	8.070E-01
1.542456E+00	3.43046E+01	2.5244E+01	4.3796E+03	8.9994E+00	0.000E+00	8.038E-01
1.551720E+00	3.68220E+01	2.9984E+01	5.1709E+03	9.0029E+00	0.000E+00	7.990E-01
1.574880E+00	3.94502E+01	3.0417E+01	5.1684E+03	9.0108E+00	0.000E+00	7.873E-01
1.593329E+00	4.06488E+01	3.0625E+01	5.1436E+03	9.0162E+00	0.000E+00	7.781E-01
1.654534E+00	4.31767E+01	3.1016E+01	5.0164E+03	9.0279E+00	0.000E+00	7.494E-01
1.679859E+00	4.35943E+01	3.1152E+01	4.9626E+03	9.0303E+00	0.000E+00	7.381E-01
1.686612E+00	4.29772E+01	3.1157E+01	4.9435E+03	9.0307E+00	0.000E+00	7.351E-01
1.696742E+00	4.44316E+01	3.2992E+01	5.2033E+03	9.0311E+00	0.000E+00	7.307E-01
1.703269E+00	4.50986E+01	3.2949E+01	5.1766E+03	9.0313E+00	0.000E+00	7.279E-01
1.722066E+00	4.64962E+01	3.2798E+01	5.0966E+03	9.0313E+00	0.000E+00	7.200E-01
1.820795E+00	5.12011E+01	3.0902E+01	4.5416E+03	9.0207E+00	0.000E+00	6.809E-01
1.843184E+00	5.19048E+01	3.0347E+01	4.4059E+03	9.0159E+00	0.000E+00	6.727E-01
1.871396E+00	5.23838E+01	2.9607E+01	4.2337E+03	9.0089E+00	0.000E+00	6.625E-01
1.878919E+00	5.20287E+01	2.9404E+01	4.1878E+03	9.0068E+00	0.000E+00	6.599E-01
1.890204E+00	5.29770E+01	3.0268E+01	4.2852E+03	9.0035E+00	0.000E+00	6.559E-01
1.918416E+00	5.43032E+01	2.9475E+01	4.1115E+03	8.9945E+00	0.000E+00	6.463E-01
1.946430E+00	5.52080E+01	2.8683E+01	3.9434E+03	8.9845E+00	0.000E+00	6.370E-01
2.080733E+00	5.78288E+01	2.5057E+01	3.2225E+03	8.9235E+00	0.000E+00	5.959E-01
2.224304E+00	5.90054E+01	2.1903E+01	2.6351E+03	8.8384E+00	0.000E+00	5.574E-01
2.377781E+00	5.96307E+01	1.9419E+01	2.1855E+03	8.7302E+00	0.000E+00	5.214E-01
2.541848E+00	6.00256E+01	1.7670E+01	1.8602E+03	8.6000E+00	0.000E+00	4.878E-01
2.717235E+00	6.03322E+01	1.6120E+01	1.5875E+03	8.4491E+00	0.000E+00	4.563E-01
2.904724E+00	6.06027E+01	1.4709E+01	1.3551E+03	8.2790E+00	0.000E+00	4.268E-01
3.105150E+00	6.09503E+01	1.3343E+01	1.1499E+03	8.0911E+00	0.000E+00	3.993E-01
3.319406E+00	6.10318E+01	1.2003E+01	9.6764E+02	7.8870E+00	0.000E+00	3.735E-01
3.548445E+00	6.10501E+01	1.0797E+01	8.1424E+02	7.6686E+00	0.000E+00	3.494E-01
3.793288E+00	6.09578E+01	9.7201E+00	6.8571E+02	7.4375E+00	0.000E+00	3.269E-01
4.055024E+00	6.07797E+01	8.7546E+00	5.7774E+02	7.1955E+00	0.000E+00	3.058E-01
4.334821E+00	6.05462E+01	7.8959E+00	4.8744E+02	6.9443E+00	0.000E+00	2.860E-01
4.633924E+00	6.02633E+01	7.1311E+00	4.1181E+02	6.6857E+00	0.000E+00	2.676E-01
4.953664E+00	5.99288E+01	6.4492E+00	3.4839E+02	6.4215E+00	0.000E+00	2.503E-01
5.295467E+00	5.95306E+01	5.8260E+00	2.9441E+02	6.1533E+00	0.000E+00	2.341E-01
5.660855E+00	5.90193E+01	5.2446E+00	2.4792E+02	5.8827E+00	0.000E+00	2.190E-01
6.051453E+00	5.83326E+01	4.7294E+00	2.0914E+02	5.6112E+00	0.000E+00	2.049E-01
6.469004E+00	5.73192E+01	4.2728E+00	1.7675E+02	5.3403E+00	0.000E+00	1.917E-01
6.915365E+00	5.53684E+01	3.8570E+00	1.4925E+02	5.0714E+00	0.000E+00	1.793E-01
7.097944E+00	5.35634E+01	3.7036E+00	1.3963E+02	4.9671E+00	0.000E+00	1.747E-01
7.206586E+00	5.05305E+01	3.6172E+00	1.3432E+02	4.9066E+00	0.000E+00	1.720E-01
7.235557E+00	4.69937E+01	3.5948E+00	1.3295E+02	4.8907E+00	0.000E+00	1.714E-01
7.279014E+00	5.05208E+01	1.0455E+01	3.8435E+02	4.8669E+00	0.000E+00	1.703E-01
7.392525E+00	5.36385E+01	1.0112E+01	3.6606E+02	4.8056E+00	0.000E+00	1.677E-01
7.771694E+00	5.52011E+01	9.1507E+00	3.1509E+02	4.6092E+00	0.000E+00	1.595E-01
7.890649E+00	5.41336E+01	8.9120E+00	3.0224E+02	4.5500E+00	0.000E+00	1.571E-01
7.902609E+00	5.37852E+01	8.8889E+00	3.0100E+02	4.5442E+00	0.000E+00	1.569E-01
7.922370E+00	5.25006E+01	8.8510E+00	2.9897E+02	4.5345E+00	0.000E+00	1.565E-01
7.969952E+00	5.43302E+01	1.2125E+01	4.0710E+02	4.5113E+00	0.000E+00	1.556E-01
8.088906E+00	5.60583E+01	1.1824E+01	3.9117E+02	4.4541E+00	0.000E+00	1.533E-01
8.208088E+00	5.67170E+01	1.1537E+01	3.7614E+02	4.3979E+00	0.000E+00	1.511E-01
8.333722E+00	5.66681E+01	1.1249E+01	3.6120E+02	4.3398E+00	0.000E+00	1.488E-01
8.367224E+00	5.59394E+01	1.1175E+01	3.5740E+02	4.3245E+00	0.000E+00	1.482E-01
8.417478E+00	5.70383E+01	1.2806E+01	4.0712E+02	4.3017E+00	0.000E+00	1.473E-01
8.447890E+00	5.74719E+01	1.2738E+01	4.0351E+02	4.2880E+00	0.000E+00	1.468E-01
8.543112E+00	5.83113E+01	1.2530E+01	3.9249E+02	4.2456E+00	0.000E+00	1.451E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
9.030794E+00	6.04779E+01	1.1524E+01	3.4148E+02	4.0382E+00	0.000E+00	1.373E-01
9.653919E+00	6.18945E+01	1.0333E+01	2.8642E+02	3.7953E+00	0.000E+00	1.284E-01
1.032004E+01	6.27750E+01	9.2524E+00	2.3992E+02	3.5602E+00	0.000E+00	1.201E-01
1.103212E+01	6.33568E+01	8.2759E+00	2.0074E+02	3.3334E+00	0.000E+00	1.124E-01
1.179334E+01	6.37404E+01	7.4018E+00	1.6795E+02	3.1153E+00	0.000E+00	1.051E-01
1.260708E+01	6.39922E+01	6.6258E+00	1.4064E+02	2.9063E+00	0.000E+00	9.834E-02
1.347697E+01	6.41543E+01	5.9363E+00	1.1787E+02	2.7067E+00	0.000E+00	9.200E-02
1.440688E+01	6.42554E+01	5.3231E+00	9.8875E+01	2.5166E+00	0.000E+00	8.606E-02
1.540095E+01	6.43753E+01	4.7588E+00	8.2687E+01	2.3362E+00	0.000E+00	8.050E-02
1.646362E+01	6.44222E+01	4.2515E+00	6.9104E+01	2.1654E+00	0.000E+00	7.531E-02
1.759961E+01	6.44323E+01	3.7894E+00	5.7618E+01	2.0042E+00	0.000E+00	7.045E-02
1.881398E+01	6.43823E+01	3.3778E+00	4.8045E+01	1.8525E+00	0.000E+00	6.590E-02
2.011215E+01	6.43148E+01	3.0136E+00	4.0097E+01	1.7100E+00	0.000E+00	6.165E-02
2.149988E+01	6.42361E+01	2.6910E+00	3.3494E+01	1.5767E+00	0.000E+00	5.767E-02
2.298338E+01	6.41503E+01	2.4051E+00	2.8004E+01	1.4521E+00	0.000E+00	5.395E-02
2.456923E+01	6.40603E+01	2.1515E+00	2.3434E+01	1.3361E+00	0.000E+00	5.046E-02
2.626450E+01	6.39699E+01	1.9262E+00	1.9626E+01	1.2282E+00	0.000E+00	4.721E-02
2.807676E+01	6.38844E+01	1.7125E+00	1.6322E+01	1.1282E+00	0.000E+00	4.416E-02
3.001405E+01	6.37780E+01	1.5200E+00	1.3552E+01	1.0357E+00	0.000E+00	4.131E-02
3.208502E+01	6.36621E+01	1.3491E+00	1.1252E+01	9.5030E-01	0.000E+00	3.864E-02
3.429889E+01	6.35343E+01	1.1961E+00	9.3320E+00	8.7163E-01	0.000E+00	3.615E-02
3.666551E+01	6.33900E+01	1.0592E+00	7.7302E+00	7.9930E-01	0.000E+00	3.381E-02
3.919543E+01	6.32174E+01	9.3498E-01	6.3835E+00	7.3293E-01	0.000E+00	3.163E-02
4.189992E+01	6.29955E+01	8.2563E-01	5.2730E+00	6.7216E-01	0.000E+00	2.959E-02
4.479101E+01	6.26711E+01	7.2944E-01	4.3580E+00	6.1660E-01	0.000E+00	2.768E-02
4.788159E+01	6.20283E+01	6.4496E-01	3.6045E+00	5.6590E-01	0.000E+00	2.589E-02
4.923432E+01	6.13442E+01	6.1279E-01	3.3307E+00	5.4608E-01	0.000E+00	2.518E-02
4.998791E+01	6.01781E+01	5.9596E-01	3.1904E+00	5.3560E-01	0.000E+00	2.480E-02
5.018886E+01	5.87811E+01	5.9160E-01	3.1543E+00	5.3287E-01	0.000E+00	2.470E-02
5.049030E+01	6.01934E+01	3.3355E+00	1.7679E+01	5.2882E-01	1.458E+01	2.456E-02
5.118542E+01	6.14133E+01	3.2652E+00	1.7071E+01	5.1971E-01	1.409E+01	2.422E-02
5.124388E+01	6.14695E+01	3.2594E+00	1.7021E+01	5.1895E-01	1.405E+01	2.419E-02
5.471721E+01	6.28932E+01	2.9371E+00	1.4364E+01	4.7768E-01	1.189E+01	2.266E-02
5.849270E+01	6.34489E+01	2.6343E+00	1.2052E+01	4.3951E-01	1.000E+01	2.120E-02
6.252870E+01	6.37699E+01	2.3606E+00	1.0103E+01	4.0487E-01	8.403E+00	1.983E-02
6.684318E+01	6.39778E+01	2.1138E+00	8.4624E+00	3.7348E-01	7.051E+00	1.855E-02
7.145536E+01	6.41165E+01	1.8907E+00	7.0807E+00	3.4506E-01	5.908E+00	1.735E-02
7.638578E+01	6.42109E+01	1.6911E+00	5.9244E+00	3.1936E-01	4.950E+00	1.623E-02
8.165640E+01	6.42766E+01	1.5105E+00	4.9501E+00	2.9612E-01	4.141E+00	1.518E-02
8.729069E+01	6.43175E+01	1.3450E+00	4.1234E+00	2.7513E-01	3.456E+00	1.420E-02
9.331374E+01	6.43408E+01	1.1979E+00	3.4352E+00	2.5616E-01	2.885E+00	1.329E-02
9.975239E+01	6.43522E+01	1.0669E+00	2.8622E+00	2.3904E-01	2.408E+00	1.243E-02
1.066353E+02	6.43832E+01	9.4693E-01	2.3763E+00	2.2356E-01	2.001E+00	1.163E-02
1.139931E+02	6.43762E+01	8.4015E-01	1.9723E+00	2.0958E-01	1.662E+00	1.088E-02
1.218587E+02	6.43640E+01	7.4547E-01	1.6371E+00	1.9692E-01	1.380E+00	1.017E-02
1.302669E+02	6.43484E+01	6.6153E-01	1.3589E+00	1.8547E-01	1.146E+00	9.518E-03
1.392553E+02	6.43308E+01	5.8709E-01	1.1282E+00	1.7508E-01	9.522E-01	8.903E-03
1.488640E+02	6.43119E+01	5.2107E-01	9.3668E-01	1.6564E-01	7.909E-01	8.329E-03
1.591356E+02	6.42924E+01	4.6251E-01	7.7775E-01	1.5705E-01	6.569E-01	7.791E-03
1.701159E+02	6.42729E+01	4.1057E-01	6.4585E-01	1.4920E-01	5.456E-01	7.288E-03
1.818539E+02	6.42535E+01	3.6449E-01	5.3635E-01	1.4203E-01	4.532E-01	6.818E-03
1.944018E+02	6.42347E+01	3.2360E-01	4.4545E-01	1.3544E-01	3.764E-01	6.378E-03
2.078156E+02	6.42164E+01	2.8733E-01	3.6999E-01	1.2937E-01	3.126E-01	5.966E-03
2.221548E+02	6.41988E+01	2.5546E-01	3.0772E-01	1.2377E-01	2.600E-01	5.581E-03
2.374835E+02	6.41825E+01	2.2781E-01	2.5670E-01	1.1856E-01	2.171E-01	5.221E-03
2.538699E+02	6.41674E+01	2.0316E-01	2.1415E-01	1.1371E-01	1.812E-01	4.884E-03
2.713869E+02	6.41534E+01	1.8119E-01	1.7866E-01	1.0917E-01	1.512E-01	4.569E-03
2.901126E+02	6.41404E+01	1.6161E-01	1.4907E-01	1.0491E-01	1.262E-01	4.274E-03
3.101304E+02	6.41284E+01	1.4415E-01	1.2438E-01	1.0089E-01	1.054E-01	3.998E-03
3.315294E+02	6.41173E+01	1.2859E-01	1.0379E-01	9.7085E-02	8.795E-02	3.740E-03
3.544049E+02	6.41071E+01	1.1471E-01	8.6616E-02	9.3465E-02	7.341E-02	3.498E-03
3.788588E+02	6.40977E+01	1.0234E-01	7.2286E-02	9.0012E-02	6.127E-02	3.273E-03
4.050001E+02	6.40890E+01	9.1305E-02	6.0329E-02	8.6706E-02	5.114E-02	3.061E-03
4.329451E+02	6.40810E+01	8.1465E-02	5.0353E-02	8.3531E-02	4.269E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 455

Td Z = 65

μ_{atomic} weight = 1.589254E+02 g/mol, nominal density ρ (g/cm³) = 8.2140E+00

μ_{rel} (barns/atom) = μ (cm²/g) \times 2.63902E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.64780E+05

μ_{edges} . Edge energies (keV):

K		5.19957E+00	L	I	8.70800E+00	L	II	8.25160E+00	L	III	7.51400E+00
M	I	1.96750E+00	M	II	1.76770E+00	M	III	1.61130E+00	M	IV	1.27500E+00
N	V	1.24120E+00	N	I	3.97900E-00	N	II	3.10200E-00	N	III	2.85000E-01
O	IV	1.47000E-00	O	V	1.47000E-00	O	I	9.40000E-03	O	II	8.60000E-03
P	III	3.90000E-02	P	VI	2.54000E-02	P	VII	2.54000E-02			

relativistic correction estimate f_{rel} (H82,3/5CL) = -1.0366E+00, -6.2340E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.4584E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
8.42800E-03	1.29810E+01	0.0000E+00	0.0000E+00	8.1435E-05	0.000E+00	1.471E+02
8.55700E-03	1.29472E+01	0.0000E+00	0.0000E+00	8.7650E-05	0.000E+00	1.449E+02
8.59140E-03	1.29206E+01	0.0000E+00	0.0000E+00	8.9365E-05	0.000E+00	1.443E+02
8.64300E-03	1.29376E+01	4.4183E-02	1.3535E+03	9.1985E-05	0.000E+00	1.435E+02
8.77200E-03	1.29409E+01	4.3243E-02	1.3053E+03	9.8782E-05	0.000E+00	1.413E+02
9.21200E-03	1.28773E+01	4.0279E-02	1.1577E+03	1.2479E-04	0.000E+00	1.346E+02
9.35300E-03	1.28122E+01	3.9401E-02	1.1154E+03	1.3410E-04	0.000E+00	1.326E+02
9.39060E-03	1.27429E+01	3.9172E-02	1.1045E+03	1.3667E-04	0.000E+00	1.320E+02
9.44700E-03	1.28081E+01	1.6984E-01	4.7604E+03	1.4058E-04	0.000E+00	1.312E+02
9.58800E-03	1.28578E+01	1.6622E-01	4.5903E+03	1.5074E-04	0.000E+00	1.293E+02
1.06900E-02	1.28370E+01	1.4498E-01	3.5911E+03	2.4963E-04	0.000E+00	1.160E+02
1.142761E-02	1.27683E+01	1.4004E-01	3.2446E+03	3.3785E-04	0.000E+00	1.085E+02
1.221612E-02	1.26780E+01	1.4113E-01	3.0589E+03	4.5491E-04	0.000E+00	1.015E+02
1.305903E-02	1.25663E+01	1.4746E-01	2.9899E+03	6.0942E-04	0.000E+00	9.494E+01
1.396010E-02	1.24303E+01	1.5886E-01	3.0132E+03	8.1230E-04	0.000E+00	8.881E+01
1.492335E-02	1.22650E+01	1.7558E-01	3.1152E+03	1.0773E-03	0.000E+00	8.308E+01
1.595306E-02	1.20622E+01	1.9819E-01	3.2894E+03	1.4217E-03	0.000E+00	7.772E+01
1.705382E-02	1.18097E+01	2.2759E-01	3.5336E+03	1.8668E-03	0.000E+00	7.270E+01
1.823053E-02	1.14875E+01	2.6496E-01	3.8482E+03	2.4393E-03	0.000E+00	6.801E+01
1.948844E-02	1.10610E+01	3.1175E-01	4.2356E+03	3.1717E-03	0.000E+00	6.362E+01
2.083314E-02	1.04620E+01	3.6973E-01	4.6991E+03	4.1040E-03	0.000E+00	5.951E+01
2.227063E-02	9.52814E+00	4.4091E-01	5.2421E+03	5.2846E-03	0.000E+00	5.567E+01
2.380730E-02	7.69941E+00	5.2762E-01	5.8681E+03	6.7723E-03	0.000E+00	5.208E+01
2.489200E-02	4.21220E+00	5.9540E-01	6.3334E+03	7.9710E-03	0.000E+00	4.981E+01
2.527300E-02	-4.41891E-01	6.2050E-01	6.5008E+03	8.4223E-03	0.000E+00	4.906E+01
2.537460E-02	-6.10700E+00	6.2730E-01	6.5458E+03	8.5454E-03	0.000E+00	4.886E+01
2.545001E-02	-3.53795E+00	1.1903E+01	1.2384E+05	8.6374E-03	0.000E+00	4.872E+01
2.552700E-02	-8.75725E-02	1.1837E+01	1.2278E+05	8.7321E-03	0.000E+00	4.857E+01
2.590800E-02	5.18255E+00	1.1522E+01	1.1775E+05	9.2103E-03	0.000E+00	4.786E+01
2.720606E-02	1.02633E+01	1.0564E+01	1.0281E+05	1.0964E-02	0.000E+00	4.557E+01
2.908327E-02	1.30050E+01	9.3993E+00	8.5574E+04	1.3852E-02	0.000E+00	4.263E+01
3.109002E-02	1.45382E+01	8.2623E+00	7.0367E+04	1.7418E-02	0.000E+00	3.988E+01
3.323523E-02	1.53677E+01	7.2428E+00	5.7703E+04	2.1800E-02	0.000E+00	3.731E+01
3.552846E-02	1.57615E+01	6.4036E+00	4.7723E+04	2.7159E-02	0.000E+00	3.490E+01
3.797993E-02	1.58784E+01	5.7661E+00	4.0199E+04	3.3679E-02	0.000E+00	3.264E+01
3.822000E-02	1.58782E+01	5.7162E+00	3.9601E+04	3.4363E-02	0.000E+00	3.244E+01
3.880500E-02	1.58646E+01	5.6032E+00	3.8233E+04	3.6061E-02	0.000E+00	3.195E+01
3.896100E-02	1.58469E+01	5.5751E+00	3.7888E+04	3.6522E-02	0.000E+00	3.182E+01
3.919500E-02	1.58610E+01	5.5671E+00	3.7608E+04	3.7220E-02	0.000E+00	3.163E+01
3.978000E-02	1.58659E+01	5.4739E+00	3.6435E+04	3.8999E-02	0.000E+00	3.117E+01
4.060054E-02	1.58529E+01	5.3603E+00	3.4958E+04	4.1575E-02	0.000E+00	3.054E+01
4.340198E-02	1.57544E+01	5.1021E+00	3.1126E+04	5.1089E-02	0.000E+00	2.857E+01
4.639671E-02	1.56225E+01	4.9983E+00	2.8525E+04	6.2497E-02	0.000E+00	2.672E+01
4.959809E-02	1.55046E+01	5.0180E+00	2.6789E+04	7.6110E-02	0.000E+00	2.500E+01
5.302035E-02	1.54090E+01	5.1339E+00	2.5638E+04	9.2277E-02	0.000E+00	2.338E+01
5.667876E-02	1.53482E+01	5.3289E+00	2.4895E+04	1.1138E-01	0.000E+00	2.187E+01
6.058959E-02	1.53299E+01	5.5850E+00	2.4407E+04	1.3386E-01	0.000E+00	2.046E+01
6.477028E-02	1.53572E+01	5.8872E+00	2.4067E+04	1.6016E-01	0.000E+00	1.914E+01
6.923942E-02	1.54298E+01	6.2227E+00	2.3796E+04	1.9081E-01	0.000E+00	1.791E+01
7.401695E-02	1.55456E+01	6.5815E+00	2.3544E+04	2.2634E-01	0.000E+00	1.675E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
7.912411E-02	1.57156E+01	6.9551E+00	2.3275E+04	2.6735E-01	0.000E+00	1.567E+01
8.458368E-02	1.59045E+01	7.3372E+00	2.2968E+04	3.1445E-01	0.000E+00	1.466E+01
9.041995E-02	1.61200E+01	7.7227E+00	2.2615E+04	3.6828E-01	0.000E+00	1.371E+01
9.665893E-02	1.63527E+01	8.1079E+00	2.2210E+04	4.2953E-01	0.000E+00	1.283E+01
1.033284E-01	1.65883E+01	8.4904E+00	2.1757E+04	4.9889E-01	0.000E+00	1.200E+01
1.104581E-01	1.68043E+01	8.8690E+00	2.1260E+04	5.7706E-01	0.000E+00	1.122E+01
1.180797E-01	1.69577E+01	9.2433E+00	2.0727E+04	6.6475E-01	0.000E+00	1.050E+01
1.262272E-01	1.69448E+01	9.6131E+00	2.0165E+04	7.6265E-01	0.000E+00	9.822E+00
1.349368E-01	1.64285E+01	9.9793E+00	1.9582E+04	8.7145E-01	0.000E+00	9.188E+00
1.440600E-01	1.29202E+01	1.0336E+01	1.8998E+04	9.8932E-01	0.000E+00	8.606E+00
1.442475E-01	1.26967E+01	1.0343E+01	1.8986E+04	9.9178E-01	0.000E+00	8.595E+00
1.462650E-01	7.45877E+00	1.0419E+01	1.8861E+04	1.0183E+00	0.000E+00	8.477E+00
1.468530E-01	-1.50937E-01	1.0441E+01	1.8825E+04	1.0261E+00	0.000E+00	8.443E+00
1.477350E-01	9.52035E+00	2.5916E+01	4.6449E+04	1.0378E+00	0.000E+00	8.392E+00
1.499400E-01	1.78559E+01	2.3503E+01	4.1505E+04	1.0671E+00	0.000E+00	8.269E+00
1.542005E-01	2.26505E+01	1.9988E+01	3.4322E+04	1.1242E+00	0.000E+00	8.040E+00
1.648404E-01	2.50777E+01	1.5265E+01	2.4520E+04	1.2694E+00	0.000E+00	7.521E+00
1.762144E-01	2.53196E+01	1.3562E+01	2.0378E+04	1.4276E+00	0.000E+00	7.036E+00
1.883732E-01	2.55971E+01	1.2490E+01	1.7555E+04	1.5994E+00	0.000E+00	6.582E+00
2.013709E-01	2.58916E+01	1.1790E+01	1.5503E+04	1.7849E+00	0.000E+00	6.157E+00
2.152655E-01	2.61729E+01	1.1254E+01	1.3842E+04	1.9843E+00	0.000E+00	5.760E+00
2.301188E-01	2.64043E+01	1.0804E+01	1.2431E+04	2.1977E+00	0.000E+00	5.388E+00
2.459970E-01	2.65511E+01	1.0414E+01	1.1210E+04	2.4248E+00	0.000E+00	5.040E+00
2.629708E-01	2.65558E+01	1.0081E+01	1.0151E+04	2.6653E+00	0.000E+00	4.715E+00
2.793000E-01	2.61966E+01	9.8302E+00	9.3192E+03	2.8937E+00	0.000E+00	4.439E+00
2.811158E-01	2.60676E+01	9.8061E+00	9.2363E+03	2.9189E+00	0.000E+00	4.410E+00
2.835750E-01	2.57171E+01	9.7746E+00	9.1268E+03	2.9530E+00	0.000E+00	4.372E+00
2.847150E-01	2.51435E+01	9.7604E+00	9.0770E+03	2.9687E+00	0.000E+00	4.355E+00
2.864250E-01	2.57205E+01	1.0867E+01	1.0046E+04	2.9923E+00	0.000E+00	4.329E+00
2.907000E-01	2.62236E+01	1.0831E+01	9.8650E+03	3.0511E+00	0.000E+00	4.265E+00
3.005128E-01	2.65754E+01	1.0760E+01	9.4810E+03	3.1849E+00	0.000E+00	4.126E+00
3.039960E-01	2.66239E+01	1.0740E+01	9.3544E+03	3.2320E+00	0.000E+00	4.078E+00
3.086490E-01	2.65850E+01	1.0715E+01	9.1925E+03	3.2947E+00	0.000E+00	4.017E+00
3.098898E-01	2.64397E+01	1.0710E+01	9.1506E+03	3.3113E+00	0.000E+00	4.001E+00
3.117510E-01	2.66468E+01	1.1036E+01	9.3733E+03	3.3362E+00	0.000E+00	3.977E+00
3.164040E-01	2.68806E+01	1.1022E+01	9.2241E+03	3.3983E+00	0.000E+00	3.919E+00
3.212482E-01	2.70249E+01	1.1011E+01	9.0759E+03	3.4624E+00	0.000E+00	3.859E+00
3.434143E-01	2.74599E+01	1.0995E+01	8.4775E+03	3.7506E+00	0.000E+00	3.610E+00
3.671099E-01	2.77821E+01	1.1022E+01	7.9498E+03	4.0481E+00	0.000E+00	3.377E+00
3.899420E-01	2.79278E+01	1.1071E+01	7.5171E+03	4.3241E+00	0.000E+00	3.180E+00
3.924405E-01	2.79046E+01	1.1076E+01	7.4732E+03	4.3537E+00	0.000E+00	3.159E+00
3.959105E-01	2.77906E+01	1.1085E+01	7.4132E+03	4.3945E+00	0.000E+00	3.132E+00
3.975021E-01	2.75468E+01	1.1088E+01	7.3860E+03	4.4132E+00	0.000E+00	3.119E+00
3.998895E-01	2.78518E+01	1.1619E+01	7.6932E+03	4.4411E+00	0.000E+00	3.100E+00
4.058580E-01	2.81765E+01	1.1636E+01	7.5914E+03	4.5102E+00	0.000E+00	3.055E+00
4.195189E-01	2.85589E+01	1.1674E+01	7.3682E+03	4.6658E+00	0.000E+00	2.955E+00
4.484657E-01	2.91553E+01	1.1739E+01	6.9308E+03	4.9829E+00	0.000E+00	2.765E+00
4.794098E-01	2.97135E+01	1.1769E+01	6.5002E+03	5.3030E+00	0.000E+00	2.586E+00
5.124891E-01	3.02513E+01	1.1748E+01	6.0695E+03	5.6243E+00	0.000E+00	2.419E+00
5.478508E-01	3.07566E+01	1.1665E+01	5.6379E+03	5.9448E+00	0.000E+00	2.263E+00
5.856525E-01	3.12088E+01	1.1518E+01	5.2072E+03	6.2622E+00	0.000E+00	2.117E+00
6.260625E-01	3.15806E+01	1.1298E+01	4.7783E+03	6.5746E+00	0.000E+00	1.980E+00
6.692609E-01	3.18319E+01	1.1009E+01	4.3554E+03	6.8796E+00	0.000E+00	1.853E+00
7.154399E-01	3.19214E+01	1.0665E+01	3.9469E+03	7.1751E+00	0.000E+00	1.733E+00
7.648052E-01	3.18038E+01	1.0281E+01	3.5595E+03	7.4589E+00	0.000E+00	1.621E+00
8.175768E-01	3.14185E+01	9.8740E+00	3.1978E+03	7.7289E+00	0.000E+00	1.516E+00
8.739896E-01	3.06748E+01	9.4552E+00	2.8645E+03	7.9831E+00	0.000E+00	1.419E+00
9.342948E-01	2.94078E+01	9.0353E+00	2.5606E+03	8.2195E+00	0.000E+00	1.327E+00
9.987612E-01	2.73044E+01	8.6217E+00	2.2857E+03	8.4363E+00	0.000E+00	1.241E+00
1.067676E+00	2.33294E+01	7.9978E+00	1.9834E+03	8.6320E+00	0.000E+00	1.161E+00
1.141345E+00	1.46076E+01	7.4237E+00	1.7222E+03	8.8050E+00	0.000E+00	1.086E+00
1.216376E+00	-2.01202E+01	6.9009E+00	1.5022E+03	8.9478E+00	0.000E+00	1.019E+00
1.220098E+00	-2.54238E+01	6.8770E+00	1.4924E+03	8.9541E+00	0.000E+00	1.016E+00
1.234994E+00	-7.33271E+01	6.7830E+00	1.4543E+03	8.9785E+00	0.000E+00	1.004E+00
1.239959E+00	-1.56051E+02	6.7522E+00	1.4419E+03	8.9864E+00	0.000E+00	9.999E-01

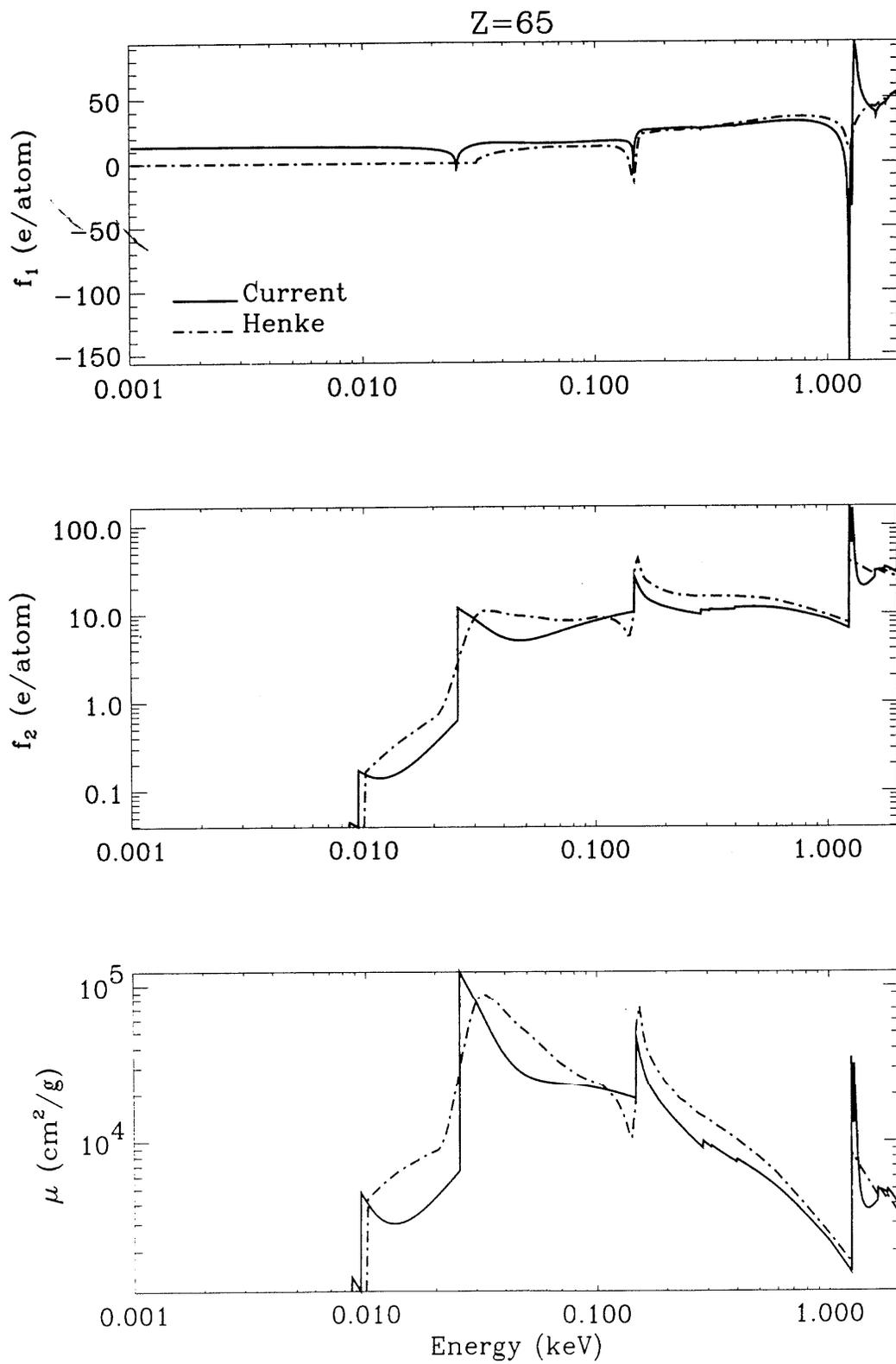
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 457

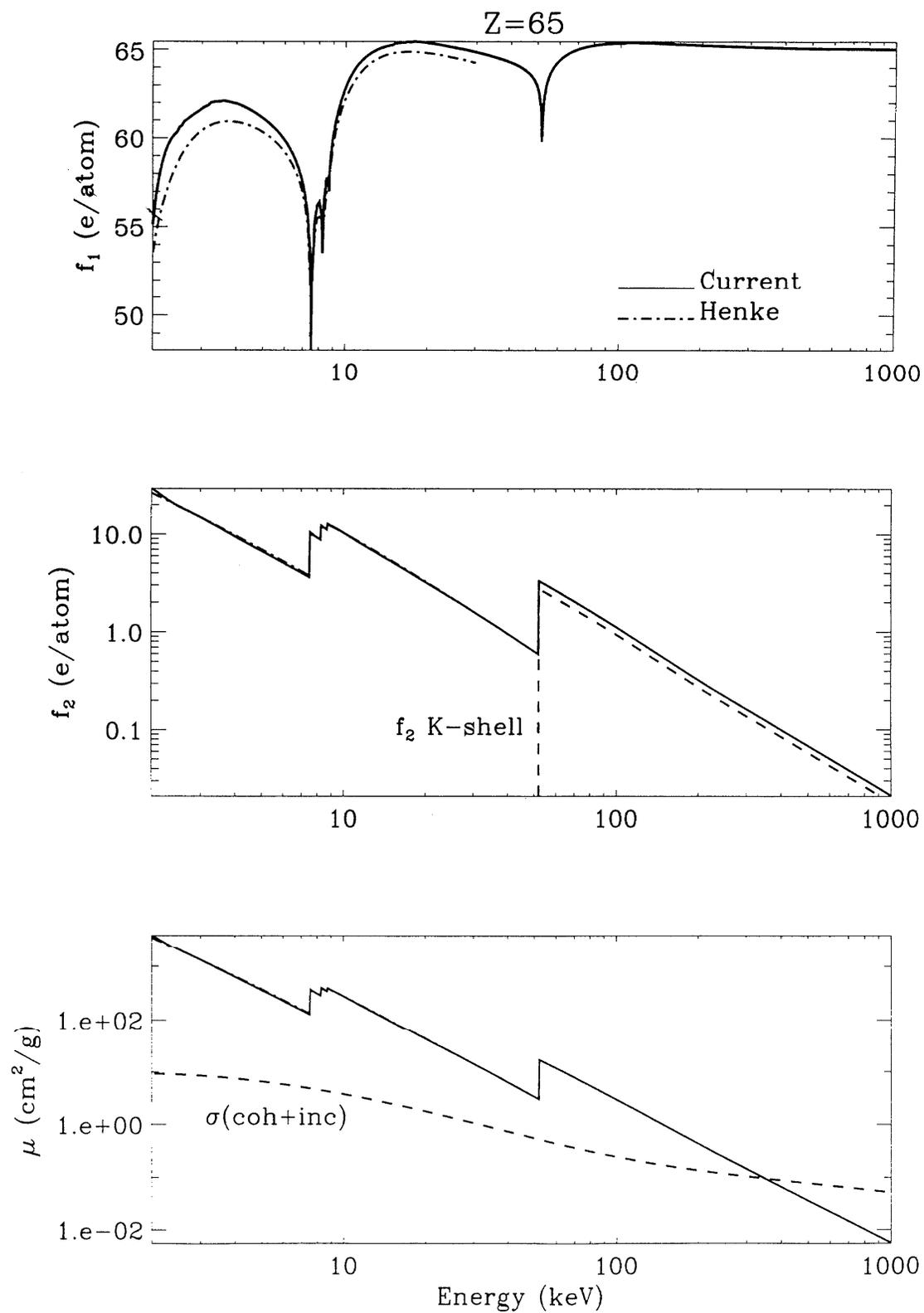
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.247406E+00	-2.34711E+01	1.6587E+02	3.5209E+04	8.9980E+00	0.000E+00	9.939E-01
1.249500E+00	-4.45583E+00	1.5296E+02	3.2413E+04	9.0013E+00	0.000E+00	9.923E-01
1.266024E+00	2.53527E+01	8.2023E+01	1.7155E+04	9.0259E+00	0.000E+00	9.793E-01
1.268625E+00	1.77217E+01	7.4595E+01	1.5569E+04	9.0297E+00	0.000E+00	9.773E-01
1.273725E+00	-3.48811E+01	6.2112E+01	1.2912E+04	9.0370E+00	0.000E+00	9.734E-01
1.281375E+00	5.49751E+01	1.5361E+02	3.1742E+04	9.0477E+00	0.000E+00	9.676E-01
1.300500E+00	9.38334E+01	7.5888E+01	1.5451E+04	9.0733E+00	0.000E+00	9.534E-01
1.304285E+00	9.27616E+01	6.7060E+01	1.3614E+04	9.0782E+00	0.000E+00	9.506E-01
1.394281E+00	5.39846E+01	2.1051E+01	3.9977E+03	9.1765E+00	0.000E+00	8.892E-01
1.490486E+00	4.34885E+01	2.0941E+01	3.7202E+03	9.2485E+00	0.000E+00	8.318E-01
1.579074E+00	3.94690E+01	2.3958E+01	4.0173E+03	9.2892E+00	0.000E+00	7.852E-01
1.593329E+00	3.87217E+01	2.4528E+01	4.0760E+03	9.2937E+00	0.000E+00	7.781E-01
1.603243E+00	3.77090E+01	2.4924E+01	4.1163E+03	9.2966E+00	0.000E+00	7.733E-01
1.609689E+00	3.55163E+01	2.5181E+01	4.1420E+03	9.2983E+00	0.000E+00	7.702E-01
1.619356E+00	3.80407E+01	2.9991E+01	4.9038E+03	9.3007E+00	0.000E+00	7.656E-01
1.643526E+00	4.06593E+01	3.0419E+01	4.9006E+03	9.3056E+00	0.000E+00	7.544E-01
1.703269E+00	4.36679E+01	3.0923E+01	4.8072E+03	9.3122E+00	0.000E+00	7.279E-01
1.732346E+00	4.46654E+01	3.1094E+01	4.7525E+03	9.3126E+00	0.000E+00	7.157E-01
1.758861E+00	4.51042E+01	3.1086E+01	4.6797E+03	9.3115E+00	0.000E+00	7.049E-01
1.765932E+00	4.44692E+01	3.1066E+01	4.6580E+03	9.3110E+00	0.000E+00	7.021E-01
1.776538E+00	4.59281E+01	3.2908E+01	4.9048E+03	9.3100E+00	0.000E+00	6.979E-01
1.803054E+00	4.79896E+01	3.2605E+01	4.7881E+03	9.3067E+00	0.000E+00	6.876E-01
1.820795E+00	4.89926E+01	3.2334E+01	4.7021E+03	9.3039E+00	0.000E+00	6.809E-01
1.928150E+00	5.31196E+01	3.0075E+01	4.1300E+03	9.2757E+00	0.000E+00	6.430E-01
1.946430E+00	5.34900E+01	2.9620E+01	4.0293E+03	9.2692E+00	0.000E+00	6.370E-01
1.957662E+00	5.35537E+01	2.9334E+01	3.9676E+03	9.2650E+00	0.000E+00	6.333E-01
1.965532E+00	5.31843E+01	2.9132E+01	3.9244E+03	9.2620E+00	0.000E+00	6.308E-01
1.977337E+00	5.41209E+01	3.0006E+01	4.0180E+03	9.2573E+00	0.000E+00	6.270E-01
2.006850E+00	5.54141E+01	2.9219E+01	3.8551E+03	9.2447E+00	0.000E+00	6.178E-01
2.080733E+00	5.73154E+01	2.7269E+01	3.4700E+03	9.2088E+00	0.000E+00	5.959E-01
2.224304E+00	5.92710E+01	2.3837E+01	2.8375E+03	9.1234E+00	0.000E+00	5.574E-01
2.377781E+00	6.01453E+01	2.0998E+01	2.3382E+03	9.0140E+00	0.000E+00	5.214E-01
2.541848E+00	6.07071E+01	1.8844E+01	1.9629E+03	8.8818E+00	0.000E+00	4.878E-01
2.717235E+00	6.11712E+01	1.7198E+01	1.6758E+03	8.7280E+00	0.000E+00	4.563E-01
2.904724E+00	6.15005E+01	1.5691E+01	1.4303E+03	8.5542E+00	0.000E+00	4.268E-01
3.105150E+00	6.18050E+01	1.4227E+01	1.2131E+03	8.3619E+00	0.000E+00	3.993E-01
3.319406E+00	6.20524E+01	1.2812E+01	1.0220E+03	8.1529E+00	0.000E+00	3.735E-01
3.548445E+00	6.21190E+01	1.1534E+01	8.6065E+02	7.9287E+00	0.000E+00	3.494E-01
3.793288E+00	6.20480E+01	1.0376E+01	7.2427E+02	7.6913E+00	0.000E+00	3.269E-01
4.055024E+00	6.19269E+01	9.3434E+00	6.1009E+02	7.4424E+00	0.000E+00	3.058E-01
4.334821E+00	6.17228E+01	8.4197E+00	5.1429E+02	7.1840E+00	0.000E+00	2.860E-01
4.633924E+00	6.14665E+01	7.5975E+00	4.3411E+02	6.9177E+00	0.000E+00	2.676E-01
4.953664E+00	6.11604E+01	6.8649E+00	3.6694E+02	6.6455E+00	0.000E+00	2.503E-01
5.295467E+00	6.07991E+01	6.2113E+00	3.1057E+02	6.3689E+00	0.000E+00	2.341E-01
5.660855E+00	6.03598E+01	5.6017E+00	2.6202E+02	6.0898E+00	0.000E+00	2.190E-01
6.051453E+00	5.97832E+01	5.0463E+00	2.2080E+02	5.8096E+00	0.000E+00	2.049E-01
6.469004E+00	5.89836E+01	4.5534E+00	1.8637E+02	5.5299E+00	0.000E+00	1.917E-01
6.915365E+00	5.77015E+01	4.1161E+00	1.5760E+02	5.2521E+00	0.000E+00	1.793E-01
7.363720E+00	5.46368E+01	3.7337E+00	1.3425E+02	4.9934E+00	0.000E+00	1.684E-01
7.392525E+00	5.41724E+01	3.7112E+00	1.3292E+02	4.9775E+00	0.000E+00	1.677E-01
7.476430E+00	5.16171E+01	3.6468E+00	1.2915E+02	4.9314E+00	0.000E+00	1.658E-01
7.506486E+00	4.80919E+01	3.6242E+00	1.2784E+02	4.9151E+00	0.000E+00	1.652E-01
7.551570E+00	5.16124E+01	1.0464E+01	3.6689E+02	4.8907E+00	0.000E+00	1.642E-01
7.664280E+00	5.46597E+01	1.0133E+01	3.5007E+02	4.8306E+00	0.000E+00	1.618E-01
7.902609E+00	5.62924E+01	9.4871E+00	3.1787E+02	4.7072E+00	0.000E+00	1.569E-01
8.086568E+00	5.63069E+01	9.1064E+00	2.9817E+02	4.6152E+00	0.000E+00	1.533E-01
8.210342E+00	5.51953E+01	8.8738E+00	2.8618E+02	4.5548E+00	0.000E+00	1.510E-01
8.243349E+00	5.35209E+01	8.8144E+00	2.8312E+02	4.5390E+00	0.000E+00	1.504E-01
8.292858E+00	5.54015E+01	1.2167E+01	3.8847E+02	4.5153E+00	0.000E+00	1.495E-01
8.416632E+00	5.71642E+01	1.1841E+01	3.7251E+02	4.4569E+00	0.000E+00	1.473E-01
8.447890E+00	5.73859E+01	1.1761E+01	3.6863E+02	4.4424E+00	0.000E+00	1.468E-01
8.533840E+00	5.77981E+01	1.1547E+01	3.5827E+02	4.4027E+00	0.000E+00	1.453E-01
8.664460E+00	5.77495E+01	1.1235E+01	3.4333E+02	4.3435E+00	0.000E+00	1.431E-01
8.699292E+00	5.70199E+01	1.1163E+01	3.3976E+02	4.3279E+00	0.000E+00	1.425E-01
8.751540E+00	5.81155E+01	1.2789E+01	3.8694E+02	4.3047E+00	0.000E+00	1.417E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
8.882160E+00	5.93813E+01	1.2511E+01	3.7296E+02	4.2475E+00	0.000E+00	1.396E-01
9.030794E+00	6.02005E+01	1.2202E+01	3.5775E+02	4.1839E+00	0.000E+00	1.373E-01
9.653919E+00	6.21877E+01	1.1006E+01	3.0187E+02	3.9326E+00	0.000E+00	1.284E-01
1.032004E+01	6.33585E+01	9.8620E+00	2.5303E+02	3.6893E+00	0.000E+00	1.201E-01
1.103212E+01	6.40963E+01	8.8004E+00	2.1122E+02	3.4545E+00	0.000E+00	1.124E-01
1.179334E+01	6.45643E+01	7.8620E+00	1.7652E+02	3.2286E+00	0.000E+00	1.051E-01
1.260708E+01	6.48759E+01	7.0353E+00	1.4776E+02	3.0122E+00	0.000E+00	9.834E-02
1.347697E+01	6.50801E+01	6.3010E+00	1.2379E+02	2.8054E+00	0.000E+00	9.200E-02
1.440688E+01	6.52095E+01	5.6482E+00	1.0381E+02	2.6084E+00	0.000E+00	8.606E-02
1.540095E+01	6.53548E+01	5.0597E+00	8.6989E+01	2.4214E+00	0.000E+00	8.050E-02
1.646362E+01	6.53846E+01	4.5252E+00	7.2778E+01	2.2444E+00	0.000E+00	7.531E-02
1.759961E+01	6.54482E+01	4.0404E+00	6.0787E+01	2.0773E+00	0.000E+00	7.045E-02
1.881398E+01	6.54127E+01	3.6017E+00	5.0689E+01	1.9199E+00	0.000E+00	6.590E-02
2.011215E+01	6.53547E+01	3.2134E+00	4.2305E+01	1.7722E+00	0.000E+00	6.165E-02
2.149988E+01	6.52827E+01	2.8695E+00	3.5340E+01	1.6338E+00	0.000E+00	5.767E-02
2.298338E+01	6.52020E+01	2.5647E+00	2.9547E+01	1.5046E+00	0.000E+00	5.395E-02
2.456923E+01	6.51162E+01	2.2943E+00	2.4726E+01	1.3842E+00	0.000E+00	5.046E-02
2.626450E+01	6.50301E+01	2.0543E+00	2.0710E+01	1.2723E+00	0.000E+00	4.721E-02
2.807676E+01	6.49464E+01	1.8264E+00	1.7224E+01	1.1685E+00	0.000E+00	4.416E-02
3.001405E+01	6.48428E+01	1.6209E+00	1.4300E+01	1.0724E+00	0.000E+00	4.131E-02
3.208502E+01	6.47303E+01	1.4399E+00	1.1883E+01	9.8375E-01	0.000E+00	3.864E-02
3.429889E+01	6.46085E+01	1.2777E+00	9.8632E+00	9.0206E-01	0.000E+00	3.615E-02
3.666551E+01	6.44733E+01	1.1329E+00	8.1814E+00	8.2694E-01	0.000E+00	3.381E-02
3.919543E+01	6.43176E+01	1.0021E+00	6.7694E+00	7.5802E-01	0.000E+00	3.163E-02
4.189992E+01	6.41253E+01	8.8527E-01	5.5943E+00	6.9489E-01	0.000E+00	2.959E-02
4.479101E+01	6.38653E+01	7.8210E-01	4.6233E+00	6.3717E-01	0.000E+00	2.768E-02
4.788159E+01	6.34418E+01	6.9148E-01	3.8238E+00	5.8450E-01	0.000E+00	2.589E-02
5.095579E+01	6.23594E+01	6.1688E-01	3.2055E+00	5.3960E-01	0.000E+00	2.433E-02
5.118542E+01	6.21547E+01	6.1183E-01	3.1650E+00	5.3650E-01	0.000E+00	2.422E-02
5.173572E+01	6.11993E+01	5.9999E-01	3.0707E+00	5.2922E-01	0.000E+00	2.396E-02
5.194371E+01	5.98099E+01	5.9561E-01	3.0361E+00	5.2652E-01	0.000E+00	2.387E-02
5.225568E+01	6.12140E+01	3.3244E+00	1.6845E+01	5.2251E-01	1.386E+01	2.373E-02
5.303561E+01	6.24827E+01	3.2494E+00	1.6223E+01	5.1275E-01	1.336E+01	2.338E-02
5.471721E+01	6.33932E+01	3.0964E+00	1.4984E+01	4.9284E-01	1.236E+01	2.266E-02
5.849270E+01	6.42121E+01	2.7800E+00	1.2584E+01	4.5317E-01	1.041E+01	2.120E-02
6.252870E+01	6.46272E+01	2.4918E+00	1.0551E+01	4.1718E-01	8.749E+00	1.983E-02
6.684318E+01	6.48831E+01	2.2322E+00	8.8423E+00	3.8456E-01	7.346E+00	1.855E-02
7.145536E+01	6.50525E+01	1.9977E+00	7.4025E+00	3.5503E-01	6.159E+00	1.735E-02
7.638578E+01	6.51669E+01	1.7875E+00	6.1960E+00	3.2832E-01	5.162E+00	1.623E-02
8.165640E+01	6.52468E+01	1.5972E+00	5.1790E+00	3.0418E-01	4.321E+00	1.518E-02
8.729069E+01	6.52984E+01	1.4228E+00	4.3157E+00	2.8237E-01	3.608E+00	1.420E-02
9.331374E+01	6.53289E+01	1.2675E+00	3.5967E+00	2.6267E-01	3.013E+00	1.329E-02
9.975239E+01	6.53454E+01	1.1294E+00	2.9979E+00	2.4489E-01	2.516E+00	1.243E-02
1.066353E+02	6.53814E+01	1.0049E+00	2.4951E+00	2.2882E-01	2.097E+00	1.163E-02
1.139931E+02	6.53781E+01	8.9182E-01	2.0715E+00	2.1430E-01	1.742E+00	1.088E-02
1.218587E+02	6.53683E+01	7.9157E-01	1.7200E+00	2.0118E-01	1.448E+00	1.017E-02
1.302669E+02	6.53544E+01	7.0266E-01	1.4282E+00	1.8929E-01	1.203E+00	9.518E-03
1.392553E+02	6.53378E+01	6.2379E-01	1.1861E+00	1.7852E-01	9.993E-01	8.903E-03
1.488640E+02	6.53196E+01	5.5382E-01	9.8506E-01	1.6875E-01	8.303E-01	8.329E-03
1.591356E+02	6.53004E+01	4.9174E-01	8.1819E-01	1.5985E-01	6.899E-01	7.791E-03
1.701159E+02	6.52810E+01	4.3666E-01	6.7965E-01	1.5174E-01	5.732E-01	7.288E-03
1.818539E+02	6.52617E+01	3.8778E-01	5.6461E-01	1.4432E-01	4.763E-01	6.818E-03
1.944018E+02	6.52427E+01	3.4439E-01	4.6907E-01	1.3752E-01	3.957E-01	6.378E-03
2.078156E+02	6.52242E+01	3.0589E-01	3.8974E-01	1.3126E-01	3.288E-01	5.966E-03
2.221548E+02	6.52063E+01	2.7171E-01	3.2384E-01	1.2548E-01	2.732E-01	5.581E-03
2.374835E+02	6.51893E+01	2.4224E-01	2.7008E-01	1.2012E-01	2.280E-01	5.221E-03
2.538699E+02	6.51737E+01	2.1619E-01	2.2548E-01	1.1513E-01	1.904E-01	4.884E-03
2.713869E+02	6.51593E+01	1.9295E-01	1.8825E-01	1.1047E-01	1.591E-01	4.569E-03
2.901126E+02	6.51459E+01	1.7223E-01	1.5719E-01	1.0610E-01	1.329E-01	4.274E-03
3.101304E+02	6.51335E+01	1.5374E-01	1.3126E-01	1.0198E-01	1.110E-01	3.998E-03
3.315294E+02	6.51221E+01	1.3724E-01	1.0961E-01	9.8083E-02	9.275E-02	3.740E-03
3.544049E+02	6.51115E+01	1.2252E-01	9.1536E-02	9.4383E-02	7.748E-02	3.498E-03
3.788588E+02	6.51017E+01	1.0939E-01	7.6449E-02	9.0857E-02	6.473E-02	3.273E-03
4.050001E+02	6.50928E+01	9.7665E-02	6.3851E-02	8.7486E-02	5.407E-02	3.061E-03
4.329451E+02	6.50845E+01	8.7205E-02	5.3333E-02	8.4251E-02	4.517E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 461

Dy **Z = 66**

Atomic weight = 1.625000E+02 g/mol, nominal density ρ (g/cm³) = 8.5250E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.69838E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.58956E+05

→ edges. Edge energies (keV):

K		5.37885E+00	L	I	9.04580E+00	L	II	8.58060E+00	L	III	7.79010E+00
M	I	2.04680E+00	M	II	1.84180E+00	M	III	1.67560E+00	M	IV	1.33250E+00
M	V	1.29490E+00	N	I	4.16300E-00	N	II	3.31800E-00	N	III	2.92900E-01
N	IV	1.54200E-00	N	V	1.54200E-00	O	I	4.20000E-03	O	II	4.20000E-03
O	III	6.29000E-02	N	VI	2.63000E-02	N	VII	2.63000E-02			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.0783E+00, -6.4740E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.4705E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
4.116000E-03	1.20399E+01	0.0000E+00	0.0000E+00	1.9080E-06	0.000E+00	3.012E+02
4.179000E-03	1.19981E+01	0.0000E+00	0.0000E+00	2.0805E-06	0.000E+00	2.967E+02
4.195800E-03	1.19535E+01	0.0000E+00	0.0000E+00	2.1285E-06	0.000E+00	2.955E+02
4.221000E-03	1.19946E+01	8.4705E-02	5.1966E+03	2.2022E-06	0.000E+00	2.937E+02
4.284000E-03	1.20271E+01	8.5785E-02	5.1855E+03	2.3951E-06	0.000E+00	2.894E+02
1.069000E-02	1.15061E+01	2.6494E-01	6.4178E+03	2.5522E-04	0.000E+00	1.160E+02
1.142761E-02	1.13999E+01	2.9523E-01	6.6901E+03	3.4524E-04	0.000E+00	1.085E+02
1.221612E-02	1.12755E+01	3.2993E-01	6.9939E+03	4.6463E-04	0.000E+00	1.015E+02
1.305903E-02	1.13472E+01	3.6970E-01	7.3311E+03	6.2214E-04	0.000E+00	9.494E+01
1.396010E-02	1.11736E+01	4.1529E-01	7.7035E+03	8.2887E-04	0.000E+00	8.881E+01
1.492335E-02	1.09656E+01	4.6755E-01	8.1130E+03	1.0988E-03	0.000E+00	8.308E+01
1.595306E-02	1.07127E+01	5.2742E-01	8.5613E+03	1.4494E-03	0.000E+00	7.772E+01
1.705382E-02	1.03998E+01	5.9600E-01	9.0500E+03	1.9023E-03	0.000E+00	7.270E+01
1.823053E-02	1.00025E+01	6.7432E-01	9.5784E+03	2.4847E-03	0.000E+00	6.801E+01
1.948844E-02	9.47980E+00	7.6357E-01	1.0146E+04	3.2294E-03	0.000E+00	6.362E+01
2.083314E-02	8.75445E+00	8.6507E-01	1.0753E+04	4.1770E-03	0.000E+00	5.951E+01
2.227063E-02	7.65884E+00	9.8022E-01	1.1398E+04	5.3766E-03	0.000E+00	5.567E+01
2.380730E-02	5.72391E+00	1.1105E+00	1.2079E+04	6.8877E-03	0.000E+00	5.208E+01
2.545001E-02	5.35432E-01	1.2576E+00	1.2796E+04	8.7814E-03	0.000E+00	4.872E+01
2.577400E-02	-2.09144E+00	1.2875E+00	1.2936E+04	9.1903E-03	0.000E+00	4.810E+01
2.616850E-02	-1.03771E+01	1.3243E+00	1.3105E+04	9.7044E-03	0.000E+00	4.738E+01
2.627370E-02	-2.06809E+00	1.3342E+00	1.3150E+04	9.8445E-03	0.000E+00	4.719E+01
2.643150E-02	-9.41095E+01	2.1825E+01	2.1383E+05	1.0057E-02	0.000E+00	4.691E+01
2.682600E-02	5.61530E-01	2.0871E+01	2.0147E+05	1.0601E-02	0.000E+00	4.622E+01
2.720606E-02	4.62242E+00	2.0011E+01	1.9047E+05	1.1143E-02	0.000E+00	4.557E+01
2.908327E-02	1.27652E+01	1.6478E+01	1.4672E+05	1.4073E-02	0.000E+00	4.263E+01
3.109002E-02	1.59925E+01	1.3594E+01	1.1323E+05	1.7690E-02	0.000E+00	3.988E+01
3.323523E-02	1.74640E+01	1.1256E+01	8.7701E+04	2.2134E-02	0.000E+00	3.731E+01
3.552846E-02	1.80436E+01	9.4549E+00	6.8914E+04	2.7567E-02	0.000E+00	3.490E+01
3.797993E-02	1.81477E+01	8.1320E+00	5.5446E+04	3.4175E-02	0.000E+00	3.264E+01
4.060054E-02	1.80083E+01	7.2103E+00	4.5988E+04	4.2175E-02	0.000E+00	3.054E+01
4.340198E-02	1.77603E+01	6.6139E+00	3.9462E+04	5.1812E-02	0.000E+00	2.857E+01
4.639671E-02	1.74826E+01	6.2771E+00	3.5034E+04	6.3366E-02	0.000E+00	2.672E+01
4.959809E-02	1.72211E+01	6.1460E+00	3.2089E+04	7.7149E-02	0.000E+00	2.500E+01
5.302035E-02	1.70027E+01	6.1788E+00	3.0178E+04	9.3515E-02	0.000E+00	2.338E+01
5.667876E-02	1.68431E+01	6.3436E+00	2.8983E+04	1.1285E-01	0.000E+00	2.187E+01
6.058959E-02	1.67508E+01	6.6164E+00	2.8278E+04	1.3559E-01	0.000E+00	2.046E+01
6.164200E-02	1.67367E+01	6.7021E+00	2.8155E+04	1.4207E-01	0.000E+00	2.011E+01
6.258550E-02	1.67217E+01	6.7824E+00	2.8063E+04	1.4801E-01	0.000E+00	1.981E+01
6.283710E-02	1.67082E+01	6.8044E+00	2.8041E+04	1.4961E-01	0.000E+00	1.973E+01
6.321450E-02	1.67212E+01	6.8637E+00	2.8117E+04	1.5203E-01	0.000E+00	1.961E+01
6.415800E-02	1.67362E+01	6.9503E+00	2.8053E+04	1.5816E-01	0.000E+00	1.932E+01
6.477028E-02	1.67444E+01	7.0080E+00	2.8018E+04	1.6221E-01	0.000E+00	1.914E+01
6.623942E-02	1.68190E+01	7.1562E+00	2.7886E+04	1.9321E-01	0.000E+00	1.791E+01
7.401695E-02	1.70661E+01	7.9731E+00	2.7895E+04	2.2914E-01	0.000E+00	1.675E+01
7.912411E-02	1.74445E+01	8.5332E+00	2.7927E+04	2.7061E-01	0.000E+00	1.567E+01
8.458368E-02	1.78946E+01	8.7702E+00	2.6850E+04	3.1823E-01	0.000E+00	1.466E+01
9.041995E-02	1.83409E+01	8.9903E+00	2.5747E+04	3.7265E-01	0.000E+00	1.371E+01
9.665893E-02	1.87849E+01	9.1862E+00	2.4610E+04	4.3457E-01	0.000E+00	1.283E+01
1.033284E-01	1.92189E+01	9.3520E+00	2.3437E+04	5.0467E-01	0.000E+00	1.200E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.104581E-01	1.96262E+01	9.4828E+00	2.2231E+04	5.8367E-01	0.000E+00	1.122E+01
1.180797E-01	1.99771E+01	9.5754E+00	2.1000E+04	6.7228E-01	0.000E+00	1.050E+01
1.262272E-01	2.02136E+01	9.6270E+00	1.9750E+04	7.7121E-01	0.000E+00	9.822E+00
1.349368E-01	2.01960E+01	9.6360E+00	1.8492E+04	8.8114E-01	0.000E+00	9.188E+00
1.442475E-01	1.94171E+01	9.6019E+00	1.7237E+04	1.0027E+00	0.000E+00	8.595E+00
1.511160E-01	1.64672E+01	9.5527E+00	1.6370E+04	1.0947E+00	0.000E+00	8.205E+00
1.534290E-01	1.13452E+01	9.5322E+00	1.6088E+04	1.1260E+00	0.000E+00	8.081E+00
1.540458E-01	4.24887E+00	9.5265E+00	1.6014E+04	1.1344E+00	0.000E+00	8.049E+00
1.542005E-01	-2.28916E+01	2.4764E+01	4.1587E+04	1.1365E+00	0.000E+00	8.040E+00
1.549710E-01	1.32126E+01	2.3903E+01	3.9941E+04	1.1470E+00	0.000E+00	8.000E+00
1.572840E-01	2.09389E+01	2.1614E+01	3.5587E+04	1.1787E+00	0.000E+00	7.883E+00
1.648404E-01	2.65780E+01	1.6451E+01	2.5844E+04	1.2832E+00	0.000E+00	7.521E+00
1.762144E-01	2.74925E+01	1.2647E+01	1.8585E+04	1.4431E+00	0.000E+00	7.036E+00
1.883732E-01	2.73390E+01	1.1099E+01	1.5258E+04	1.6166E+00	0.000E+00	6.582E+00
2.013709E-01	2.72460E+01	1.0323E+01	1.3275E+04	1.8040E+00	0.000E+00	6.157E+00
2.152655E-01	2.72328E+01	9.8432E+00	1.1841E+04	2.0055E+00	0.000E+00	5.760E+00
2.301188E-01	2.72493E+01	9.5006E+00	1.0691E+04	2.2210E+00	0.000E+00	5.388E+00
2.459970E-01	2.72489E+01	9.2389E+00	9.7256E+03	2.4504E+00	0.000E+00	5.040E+00
2.629708E-01	2.71810E+01	9.0384E+00	8.9004E+03	2.6935E+00	0.000E+00	4.715E+00
2.811158E-01	2.69110E+01	8.8937E+00	8.1926E+03	2.9498E+00	0.000E+00	4.410E+00
2.870420E-01	2.66690E+01	8.8599E+00	7.9930E+03	3.0325E+00	0.000E+00	4.319E+00
2.914355E-01	2.61677E+01	8.8387E+00	7.8536E+03	3.0935E+00	0.000E+00	4.254E+00
2.926071E-01	2.55806E+01	8.8335E+00	7.8176E+03	3.1097E+00	0.000E+00	4.237E+00
2.943645E-01	2.61643E+01	9.9743E+00	8.7745E+03	3.1340E+00	0.000E+00	4.212E+00
2.987580E-01	2.66695E+01	9.9708E+00	8.6424E+03	3.1945E+00	0.000E+00	4.150E+00
3.005128E-01	2.67656E+01	9.9702E+00	8.5915E+03	3.2186E+00	0.000E+00	4.126E+00
3.212482E-01	2.72184E+01	9.9947E+00	8.0566E+03	3.4990E+00	0.000E+00	3.859E+00
3.251640E-01	2.72346E+01	1.0005E+01	7.9679E+03	3.5512E+00	0.000E+00	3.813E+00
3.301410E-01	2.71628E+01	1.0020E+01	7.8597E+03	3.6170E+00	0.000E+00	3.755E+00
3.314682E-01	2.70107E+01	1.0025E+01	7.8317E+03	3.6345E+00	0.000E+00	3.740E+00
3.334590E-01	2.72077E+01	1.0366E+01	8.0500E+03	3.6606E+00	0.000E+00	3.718E+00
3.384360E-01	2.74210E+01	1.0390E+01	7.9498E+03	3.7257E+00	0.000E+00	3.663E+00
3.434143E-01	2.75445E+01	1.0415E+01	7.8537E+03	3.7903E+00	0.000E+00	3.610E+00
3.671099E-01	2.79418E+01	1.0555E+01	7.4452E+03	4.0910E+00	0.000E+00	3.377E+00
3.924405E-01	2.82452E+01	1.0720E+01	7.0739E+03	4.4000E+00	0.000E+00	3.159E+00
4.079740E-01	2.83225E+01	1.0821E+01	6.8686E+03	4.5829E+00	0.000E+00	3.039E+00
4.142185E-01	2.81922E+01	1.0861E+01	6.7897E+03	4.6550E+00	0.000E+00	2.993E+00
4.158837E-01	2.79508E+01	1.0871E+01	6.7689E+03	4.6741E+00	0.000E+00	2.981E+00
4.183815E-01	2.82578E+01	1.1410E+01	7.0621E+03	4.7026E+00	0.000E+00	2.963E+00
4.195189E-01	2.83485E+01	1.1417E+01	7.0476E+03	4.7156E+00	0.000E+00	2.955E+00
4.246260E-01	2.85890E+01	1.1451E+01	6.9831E+03	4.7734E+00	0.000E+00	2.920E+00
4.484657E-01	2.92048E+01	1.1592E+01	6.6937E+03	5.0362E+00	0.000E+00	2.765E+00
4.794098E-01	2.98342E+01	1.1733E+01	6.3376E+03	5.3600E+00	0.000E+00	2.586E+00
5.124891E-01	3.04363E+01	1.1817E+01	5.9713E+03	5.6851E+00	0.000E+00	2.419E+00
5.478508E-01	3.10176E+01	1.1834E+01	5.5936E+03	6.0094E+00	0.000E+00	2.263E+00
5.856525E-01	3.15603E+01	1.1776E+01	5.2071E+03	6.3307E+00	0.000E+00	2.117E+00
6.260625E-01	3.20410E+01	1.1643E+01	4.8160E+03	6.6470E+00	0.000E+00	1.980E+00
6.692609E-01	3.24282E+01	1.1430E+01	4.4225E+03	6.9559E+00	0.000E+00	1.853E+00
7.154399E-01	3.26820E+01	1.1145E+01	4.0338E+03	7.2553E+00	0.000E+00	1.733E+00
7.648052E-01	3.27575E+01	1.0802E+01	3.6574E+03	7.5430E+00	0.000E+00	1.621E+00
8.175768E-01	3.26065E+01	1.0423E+01	3.3012E+03	7.8168E+00	0.000E+00	1.516E+00
8.739896E-01	3.21631E+01	1.0022E+01	2.9695E+03	8.0747E+00	0.000E+00	1.419E+00
9.342948E-01	3.13224E+01	9.6126E+00	2.6643E+03	8.3147E+00	0.000E+00	1.327E+00
9.987612E-01	2.98898E+01	9.2041E+00	2.3864E+03	8.5350E+00	0.000E+00	1.241E+00
1.067676E+00	2.75985E+01	8.5291E+00	2.0687E+03	8.7340E+00	0.000E+00	1.161E+00
1.141345E+00	2.26491E+01	7.9086E+00	1.7943E+03	8.9101E+00	0.000E+00	1.086E+00
1.220098E+00	1.00398E+01	7.3280E+00	1.5553E+03	9.0621E+00	0.000E+00	1.016E+00
1.269002E+00	-1.73697E+01	7.0051E+00	1.4295E+03	9.1399E+00	0.000E+00	9.770E-01
1.288425E+00	-6.92833E-01	6.8850E+00	1.3838E+03	9.1676E+00	0.000E+00	9.623E-01
1.293605E+00	-1.50324E+02	6.8537E+00	1.3720E+03	9.1747E+00	0.000E+00	9.584E-01
1.301374E+00	-1.99587E+01	1.6318E+02	3.2470E+04	9.1851E+00	0.000E+00	9.527E-01
1.304285E+00	3.75529E+00	1.4662E+02	2.9110E+04	9.1890E+00	0.000E+00	9.506E-01
1.305850E+00	1.24915E+01	1.3846E+02	2.7458E+04	9.1910E+00	0.000E+00	9.495E-01
1.320798E+00	3.28106E+01	8.1182E+01	1.5917E+04	9.2100E+00	0.000E+00	9.387E-01
1.325837E+00	2.11019E+01	6.8225E+01	1.3325E+04	9.2162E+00	0.000E+00	9.351E-01

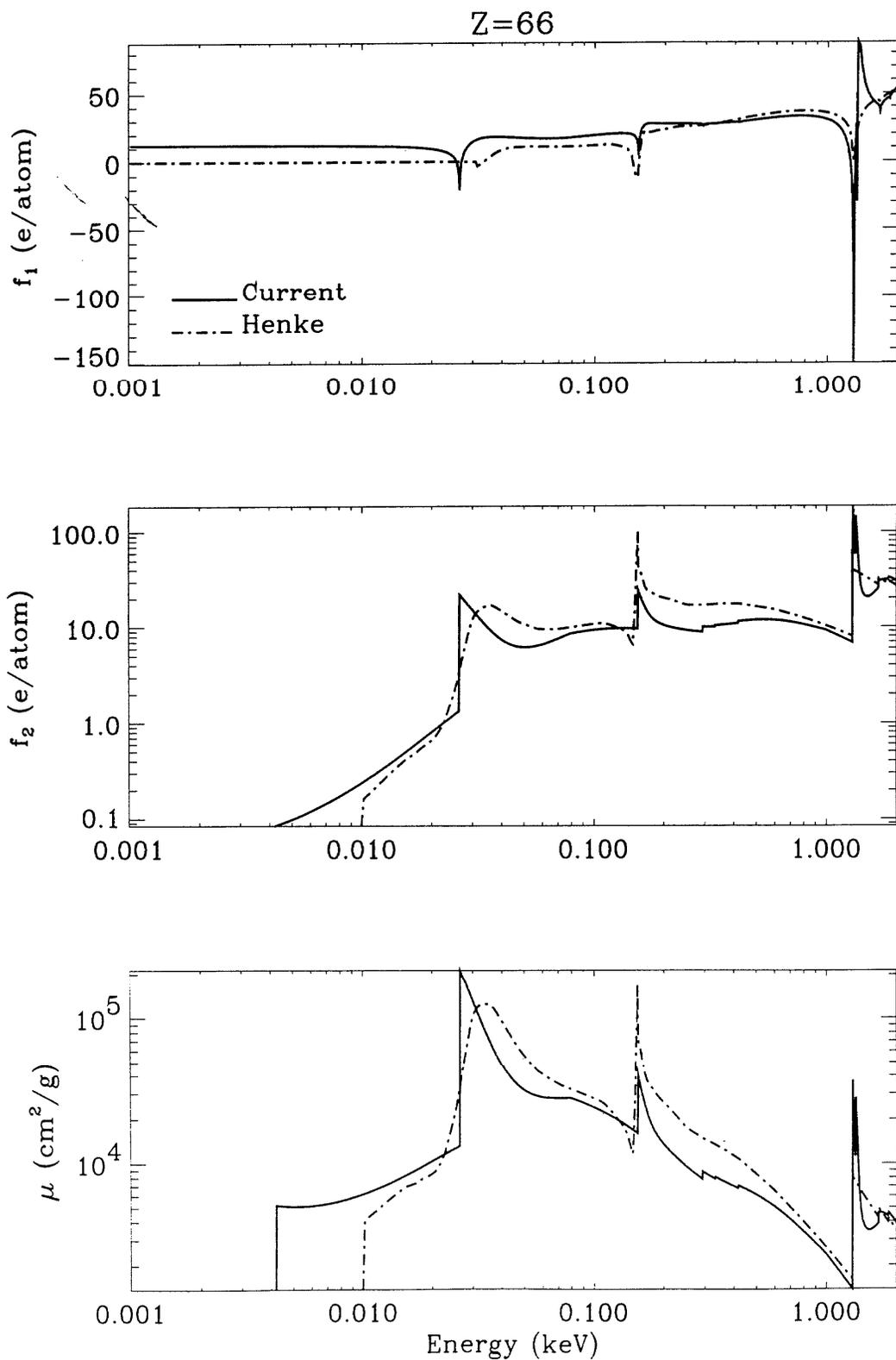
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 463

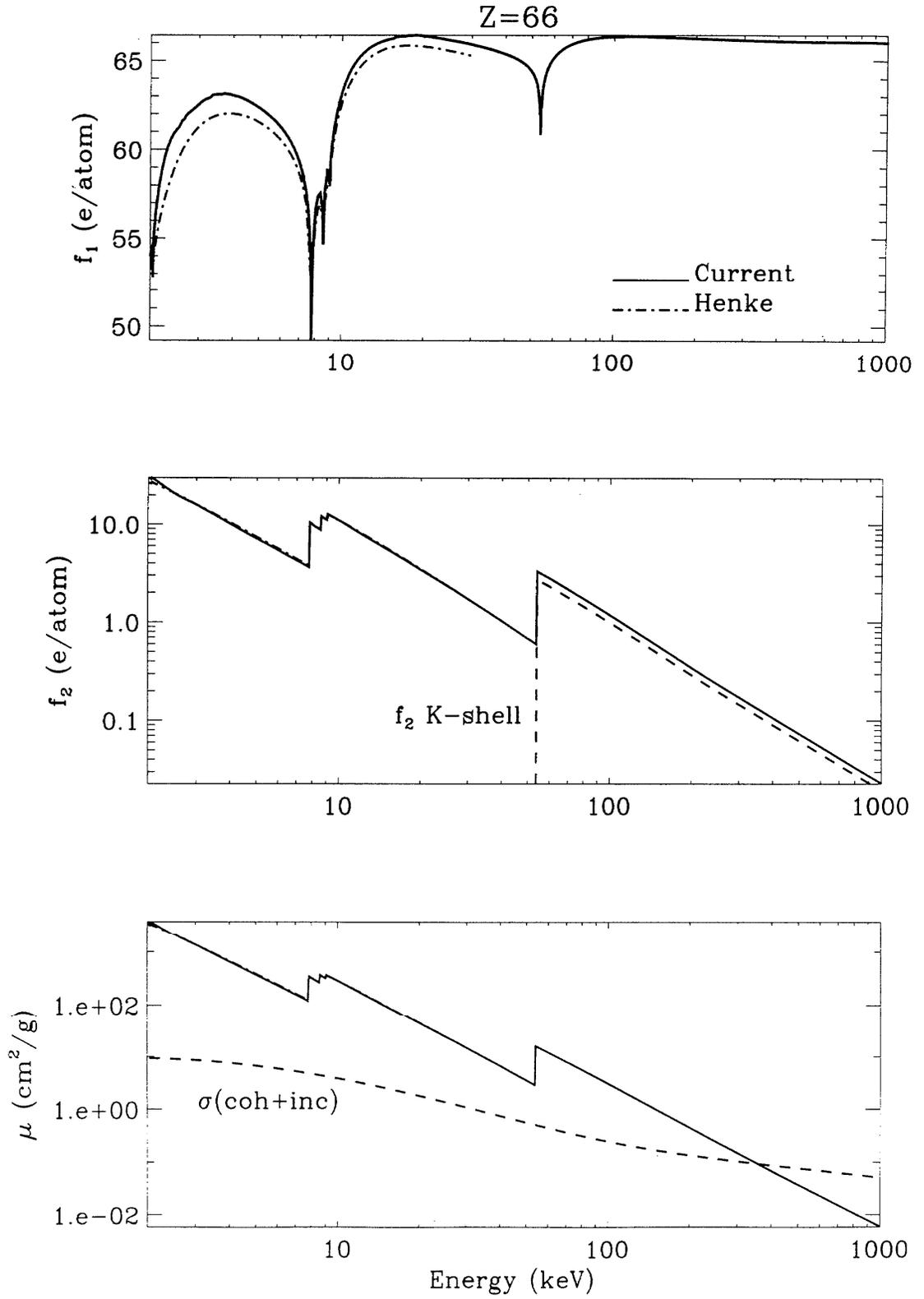
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
1.331167E+00	-2.99018E+01	5.6994E+01	1.1087E+04	9.2226E+00	0.000E+00	9.314E-01
1.339163E+00	5.47929E+01	1.4531E+02	2.8098E+04	9.2320E+00	0.000E+00	9.258E-01
1.359150E+00	9.14917E+01	7.2947E+01	1.3898E+04	9.2543E+00	0.000E+00	9.122E-01
1.394281E+00	7.53273E+01	3.0852E+01	5.7301E+03	9.2898E+00	0.000E+00	8.892E-01
1.490486E+00	4.99451E+01	2.0434E+01	3.5502E+03	9.3640E+00	0.000E+00	8.318E-01
1.593329E+00	4.26329E+01	2.2077E+01	3.5881E+03	9.4112E+00	0.000E+00	7.781E-01
1.642088E+00	4.06967E+01	2.3778E+01	3.7498E+03	9.4236E+00	0.000E+00	7.550E-01
1.667222E+00	3.88568E+01	2.4722E+01	3.8398E+03	9.4278E+00	0.000E+00	7.437E-01
1.673924E+00	3.66208E+01	2.4974E+01	3.8635E+03	9.4286E+00	0.000E+00	7.407E-01
1.683978E+00	3.91590E+01	2.9905E+01	4.5986E+03	9.4297E+00	0.000E+00	7.363E-01
1.703269E+00	4.13681E+01	3.0217E+01	4.3940E+03	9.4313E+00	0.000E+00	7.279E-01
1.709112E+00	4.17872E+01	3.0310E+01	4.5924E+03	9.4316E+00	0.000E+00	7.254E-01
1.804964E+00	4.59858E+01	3.0978E+01	4.4444E+03	9.4267E+00	0.000E+00	6.869E-01
1.820795E+00	4.63741E+01	3.0962E+01	4.4034E+03	9.4243E+00	0.000E+00	6.809E-01
1.837591E+00	4.64108F+01	3.0932E+01	4.3709E+03	9.4222E+00	0.000E+00	6.766E-01
1.839958E+00	4.57810E+01	3.0901E+01	4.3490E+03	9.4208E+00	0.000E+00	6.738E-01
1.851009E+00	4.72409E+01	3.2695E+01	4.5740E+03	9.4185E+00	0.000E+00	6.698E-01
1.878636E+00	4.92635E+01	3.2356E+01	4.4601E+03	9.4119E+00	0.000E+00	6.600E-01
1.946430E+00	5.23218E+01	3.1164E+01	4.1461E+03	9.3907E+00	0.000E+00	6.370E-01
2.005864E+00	5.41385E+01	2.9868E+01	3.8560E+03	9.3670E+00	0.000E+00	6.181E-01
2.036566E+00	5.45509E+01	2.9137E+01	3.7048E+03	9.3530E+00	0.000E+00	6.088E-01
2.044753E+00	5.41760E+01	2.8937E+01	3.6648E+03	9.3491E+00	0.000E+00	6.064E-01
2.057034E+00	5.51050E+01	2.9816E+01	3.7534E+03	9.3431E+00	0.000E+00	6.027E-01
2.080733E+00	5.61474E+01	2.9218E+01	3.6363E+03	9.3310E+00	0.000E+00	5.959E-01
2.087736E+00	5.63805E+01	2.9041E+01	3.6022E+03	9.3274E+00	0.000E+00	5.939E-01
2.224304E+00	5.92170E+01	2.5706E+01	2.9928E+03	9.2460E+00	0.000E+00	5.574E-01
2.377781E+00	6.06216E+01	2.2575E+01	2.4585E+03	9.1367E+00	0.000E+00	5.214E-01
2.541848E+00	6.12637E+01	2.0067E+01	2.0444E+03	9.0042E+00	0.000E+00	4.878E-01
2.717235E+00	6.19624E+01	1.8205E+01	1.7349E+03	8.8499E+00	0.000E+00	4.563E-01
2.904724E+00	6.23417E+01	1.6630E+01	1.4826E+03	8.6753E+00	0.000E+00	4.268E-01
3.105150E+00	6.27315E+01	1.5070E+01	1.2567E+03	8.4818E+00	0.000E+00	3.993E-01
3.319406E+00	6.29254E+01	1.3585E+01	1.0598E+03	8.2712E+00	0.000E+00	3.735E-01
3.548445E+00	6.31001E+01	1.2231E+01	8.9258E+02	8.0453E+00	0.000E+00	3.494E-01
3.793288E+00	6.31211E+01	1.1012E+01	7.5175E+02	7.8059E+00	0.000E+00	3.269E-01
4.055024E+00	6.30127E+01	9.9154E+00	6.3320E+02	7.5548E+00	0.000E+00	3.058E-01
4.334821E+00	6.28643E+01	8.9317E+00	5.3356E+02	7.2938E+00	0.000E+00	2.860E-01
4.633924E+00	6.26369E+01	8.0550E+00	4.5014E+02	7.0249E+00	0.000E+00	2.676E-01
4.953664E+00	6.23597E+01	7.2743E+00	3.8027E+02	6.7497E+00	0.000E+00	2.503E-01
5.295467E+00	6.20314E+01	6.5780E+00	3.2167E+02	6.4701E+00	0.000E+00	2.341E-01
5.660855E+00	6.16424E+01	5.9509E+00	2.7222E+02	6.1877E+00	0.000E+00	2.190E-01
6.051453E+00	6.11523E+01	5.3613E+00	2.2942E+02	5.9042E+00	0.000E+00	2.049E-01
6.469004E+00	6.04954E+01	4.8341E+00	1.9351E+02	5.6211E+00	0.000E+00	1.917E-01
6.915365E+00	5.95372E+01	4.3657E+00	1.6348E+02	5.3397E+00	0.000E+00	1.793E-01
7.392525E+00	5.77675E+01	3.9446E+00	1.3818E+02	5.0615E+00	0.000E+00	1.677E-01
7.634298E+00	5.57189E+01	3.7521E+00	1.2727E+02	4.9288E+00	0.000E+00	1.624E-01
7.751150E+00	5.27186E+01	3.6650E+00	1.2244E+02	4.8665E+00	0.000E+00	1.600E-01
7.782310E+00	4.92132E+01	3.6423E+00	1.2120E+02	4.8501E+00	0.000E+00	1.593E-01
7.829051E+00	5.27159E+01	1.0445E+01	3.4549E+02	4.8257E+00	0.000E+00	1.584E-01
7.902609E+00	5.50591E+01	1.0238E+01	3.3549E+02	4.7876E+00	0.000E+00	1.569E-01
7.945902E+00	5.57528E+01	1.0119E+01	3.2978E+02	4.7654E+00	0.000E+00	1.560E-01
8.408988E+00	5.74449E+01	9.0602E+00	2.7901E+02	4.5373E+00	0.000E+00	1.474E-01
8.447890E+00	5.72929E+01	8.9898E+00	2.7557E+02	4.5191E+00	0.000E+00	1.468E-01
8.537697E+00	5.63280E+01	8.8326E+00	2.6790E+02	4.4771E+00	0.000E+00	1.452E-01
8.572019E+00	5.46603E+01	8.7742E+00	2.6506E+02	4.4612E+00	0.000E+00	1.446E-01
8.623503E+00	5.65372E+01	1.2108E+01	3.6360E+02	4.4376E+00	0.000E+00	1.438E-01
8.752212E+00	5.82818E+01	1.1765E+01	3.4811E+02	4.3792E+00	0.000E+00	1.417E-01
8.864884E+00	5.88592E+01	1.1478E+01	3.3530E+02	4.3292E+00	0.000E+00	1.399E-01
9.000571E+00	5.87877E+01	1.1188E+01	3.2190E+02	4.2700E+00	0.000E+00	1.378E-01
9.030794E+00	5.83174E+01	1.1127E+01	3.1906E+02	4.2570E+00	0.000E+00	1.373E-01
9.036754E+00	5.80648E+01	1.1115E+01	3.1850E+02	4.2544E+00	0.000E+00	1.372E-01
9.091029E+00	5.91577E+01	1.2735E+01	3.6274E+02	4.2313E+00	0.000E+00	1.364E-01
9.226716E+00	6.04204E+01	1.2459E+01	3.4969E+02	4.1742E+00	0.000E+00	1.344E-01
9.653919E+00	6.22520E+01	1.1649E+01	3.1248E+02	4.0021E+00	0.000E+00	1.284E-01
1.032004E+01	6.38114E+01	1.0464E+01	2.6257E+02	3.7551E+00	0.000E+00	1.201E-01
1.103212E+01	6.47480E+01	9.3197E+00	2.1876E+02	3.5168E+00	0.000E+00	1.124E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.179334E+01	6.53232E+01	8.3321E+00	1.8295E+02	3.2874E+00	0.000E+00	1.051E-01
1.260708E+01	6.57140E+01	7.4556E+00	1.5314E+02	3.0675E+00	0.000E+00	9.834E-02
1.347697E+01	6.59725E+01	6.6764E+00	1.2828E+02	2.8574E+00	0.000E+00	9.200E-02
1.440688E+01	6.61399E+01	5.9834E+00	1.0755E+02	2.6572E+00	0.000E+00	8.606E-02
1.540095E+01	6.62445E+01	5.3666E+00	9.0236E+01	2.4671E+00	0.000E+00	8.050E-02
1.646362E+01	6.63671E+01	4.8016E+00	7.5524E+01	2.2870E+00	0.000E+00	7.531E-02
1.759961E+01	6.64171E+01	4.2936E+00	6.3174E+01	2.1169E+00	0.000E+00	7.045E-02
1.881398E+01	6.64299E+01	3.8318E+00	5.2741E+01	1.9568E+00	0.000E+00	6.590E-02
2.011215E+01	6.63840E+01	3.4190E+00	4.4022E+01	1.8064E+00	0.000E+00	6.165E-02
2.149988E+01	6.63205E+01	3.0534E+00	3.6777E+01	1.6655E+00	0.000E+00	5.767E-02
2.298338E+01	6.62462E+01	2.7293E+00	3.0751E+01	1.5338E+00	0.000E+00	5.395E-02
2.456923E+01	6.61656E+01	2.4418E+00	2.5736E+01	1.4111E+00	0.000E+00	5.046E-02
2.626450E+01	6.60849E+01	2.1865E+00	2.1558E+01	1.2971E+00	0.000E+00	4.721E-02
2.807676E+01	6.60029E+01	1.9442E+00	1.7931E+01	1.1912E+00	0.000E+00	4.416E-02
3.001405E+01	6.59027E+01	1.7255E+00	1.4887E+01	1.0933E+00	0.000E+00	4.131E-02
3.208502E+01	6.57934E+01	1.5327E+00	1.2370E+01	1.0028E+00	0.000E+00	3.864E-02
3.429889E+01	6.56765E+01	1.3618E+00	1.0282E+01	9.1942E-01	0.000E+00	3.615E-02
3.666551E+01	6.55487E+01	1.2085E+00	8.5352E+00	8.4274E-01	0.000E+00	3.381E-02
3.919543E+01	6.54053E+01	1.0720E+00	7.0823E+00	7.7236E-01	0.000E+00	3.163E-02
4.189992E+01	6.52349E+01	9.4701E-01	5.8529E+00	7.0789E-01	0.000E+00	2.959E-02
4.479101E+01	6.50163E+01	8.3701E-01	4.8391E+00	6.4892E-01	0.000E+00	2.768E-02
4.788159E+01	6.46984E+01	7.4000E-01	4.0021E+00	5.9510E-01	0.000E+00	2.589E-02
5.118542E+01	6.40762E+01	6.5474E-01	3.3124E+00	5.4604E-01	0.000E+00	2.422E-02
5.271273E+01	6.33752E+01	6.2051E-01	3.0483E+00	5.2584E-01	0.000E+00	2.352E-02
5.351956E+01	6.22214E+01	6.0356E-01	2.9204E+00	5.1574E-01	0.000E+00	2.317E-02
5.373471E+01	6.08393E+01	5.9917E-01	2.8875E+00	5.1310E-01	0.000E+00	2.307E-02
5.405744E+01	6.22361E+01	3.3135E+00	1.5873E+01	5.0920E-01	1.303E+01	2.294E-02
5.471721E+01	6.33622E+01	3.2518E+00	1.5390E+01	5.0140E-01	1.265E+01	2.266E-02
5.486427E+01	6.34983E+01	3.2383E+00	1.5285E+01	4.9969E-01	1.256E+01	2.260E-02
5.849270E+01	6.48889E+01	2.9264E+00	1.2956E+01	4.6083E-01	1.068E+01	2.120E-02
6.252870E+01	6.54469E+01	2.6252E+00	1.0872E+01	4.2402E-01	8.985E+00	1.983E-02
6.684318E+01	6.57676E+01	2.3528E+00	9.1150E+00	3.9065E-01	7.549E+00	1.855E-02
7.145535E+01	6.59746E+01	2.1076E+00	7.6382E+00	3.6044E-01	6.337E+00	1.735E-02
7.638578E+01	6.61132E+01	1.8865E+00	6.3955E+00	3.3311E-01	5.314E+00	1.623E-02
8.165640E+01	6.62115E+01	1.6863E+00	5.3477E+00	3.0841E-01	4.450E+00	1.518E-02
8.729069E+01	6.62745E+01	1.5027E+00	4.4580E+00	2.8609E-01	3.718E+00	1.420E-02
9.331374E+01	6.63134E+01	1.3393E+00	3.7168E+00	2.6593E-01	3.106E+00	1.329E-02
9.975239E+01	6.63358E+01	1.1938E+00	3.0992E+00	2.4772E-01	2.595E+00	1.243E-02
1.066353E+02	6.63469E+01	1.0643E+00	2.5845E+00	2.3128E-01	2.168E+00	1.163E-02
1.139931E+02	6.63776E+01	9.4540E-01	2.1477E+00	2.1643E-01	1.803E+00	1.088E-02
1.218587E+02	6.63708E+01	8.3942E-01	1.7838E+00	2.0300E-01	1.499E+00	1.017E-02
1.302669E+02	6.63589E+01	7.4538E-01	1.4817E+00	1.9085E-01	1.246E+00	9.518E-03
1.392553E+02	6.63437E+01	6.6194E-01	1.2309E+00	1.7984E-01	1.035E+00	8.903E-03
1.488640E+02	6.63263E+01	5.8790E-01	1.0227E+00	1.6985E-01	8.606E-01	8.329E-03
1.591356E+02	6.63078E+01	5.2218E-01	8.4973E-01	1.6076E-01	7.153E-01	7.791E-03
1.701159E+02	6.62886E+01	4.6385E-01	7.0609E-01	1.5248E-01	5.945E-01	7.288E-03
1.818539E+02	6.62693E+01	4.1207E-01	5.8678E-01	1.4491E-01	4.942E-01	6.818E-03
1.944018E+02	6.62503E+01	3.6610E-01	4.8767E-01	1.3798E-01	4.108E-01	6.378E-03
2.078156E+02	6.62317E+01	3.2528E-01	4.0533E-01	1.3160E-01	3.414E-01	5.966E-03
2.221548E+02	6.62136E+01	2.8903E-01	3.3691E-01	1.2572E-01	2.838E-01	5.581E-03
2.374835E+02	6.61961E+01	2.5720E-01	2.8046E-01	1.2027E-01	2.363E-01	5.221E-03
2.538699E+02	6.61800E+01	2.2971E-01	2.3431E-01	1.1521E-01	1.975E-01	4.884E-03
2.713869E+02	6.61651E+01	2.0517E-01	1.9577E-01	1.1048E-01	1.652E-01	4.569E-03
2.901126E+02	6.61513E+01	1.8327E-01	1.6358E-01	1.0605E-01	1.381E-01	4.274E-03
3.101304E+02	6.61386E+01	1.6371E-01	1.3670E-01	1.0188E-01	1.155E-01	3.998E-03
3.315294E+02	6.61268E+01	1.4625E-01	1.1424E-01	9.7943E-02	9.653E-02	3.740E-03
3.544049E+02	6.61159E+01	1.3066E-01	9.5471E-02	9.4207E-02	8.071E-02	3.498E-03
3.788588E+02	6.61058E+01	1.1674E-01	7.9794E-02	9.0651E-02	6.748E-02	3.273E-03
4.050001E+02	6.60966E+01	1.0431E-01	6.6695E-02	8.7255E-02	5.642E-02	3.061E-03
4.329451E+02	6.60880E+01	9.3206E-02	5.5749E-02	8.4000E-02	4.717E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 467

Ho Z = 67

Atomic weight = 1.649304E+02 g/mol, nominal density ρ (g/cm³) = 8.7690E+00

μ_a (barns/atom) = μ (cm²/g) \times 2.73874E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.55140E+05

9 edges. Edge energies (keV):

K		5.56177E+00	L	I	9.39420E+00	L	II	8.91780E+00	L	III	8.07110E+00
M	I	2.12830E+00	M	II	1.92280E+00	M	III	1.74120E+00	M	IV	1.39150E+00
M	K	1.35140E+00	N	I	4.35700E-00	N	II	3.43500E-00	N	III	3.06600E-01
N	IV	1.61000E-00	N	V	1.61000E-00	O	I	3.70000E-03	O	II	3.70000E-03
O	III	5.12000E-02	N	VI	2.03000E-02	N	VII	2.03000E-02			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.1210E+00, -6.7140E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.4931E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	9.73216E+00	2.9493E-01	7.0392E+03	2.5936E-04	0.000E+00	1.160E+02
1.142761E-02	9.93946E+00	3.2621E-01	7.2831E+03	3.5077E-04	0.000E+00	1.085E+02
1.221612E-02	9.65648E+00	3.6196E-01	7.5596E+03	4.7200E-04	0.000E+00	1.015E+02
1.305903E-02	9.30247E+00	4.0282E-01	7.8701E+03	6.3192E-04	0.000E+00	9.494E+01
1.396010E-02	8.84880E+00	4.4955E-01	8.2162E+03	8.4177E-04	0.000E+00	8.881E+01
1.492335E-02	8.24754E+00	5.0299E-01	8.5995E+03	1.1157E-03	0.000E+00	8.308E+01
1.595306E-02	7.41052E+00	5.6408E-01	9.0215E+03	1.4715E-03	0.000E+00	7.772E+01
1.705382E-02	6.15120E+00	6.3386E-01	9.4831E+03	1.9312E-03	0.000E+00	7.270E+01
1.823053E-02	3.97033E+00	7.1346E-01	9.9851E+03	2.5220E-03	0.000E+00	6.801E+01
1.948844E-02	-1.39811E+00	8.0413E-01	1.0528E+04	3.2776E-03	0.000E+00	6.362E+01
1.989400E-02	-5.95584E+00	8.3457E-01	1.0703E+04	3.5502E-03	0.000E+00	6.232E+01
2.019850E-02	-1.60324E+01	8.5779E-01	1.0835E+04	3.7646E-03	0.000E+00	6.138E+01
2.027970E-02	-2.85314E+01	8.6404E-01	1.0871E+04	3.8232E-03	0.000E+00	6.114E+01
2.040150E-02	-1.49118E+01	2.5698E+01	3.2137E+05	3.9123E-03	0.000E+00	6.077E+01
2.070600E-02	-2.86167E+00	2.4583E+01	3.0291E+05	4.1409E-03	0.000E+00	5.988E+01
2.083314E-02	-4.10622E-01	2.4138E+01	2.9561E+05	4.2389E-03	0.000E+00	5.951E+01
2.227063E-02	1.12389E+01	1.9827E+01	2.2714E+05	5.4557E-03	0.000E+00	5.567E+01
2.380730E-02	1.55912E+01	1.6295E+01	1.7464E+05	6.9884E-03	0.000E+00	5.208E+01
2.545001E-02	1.76656E+01	1.3389E+01	1.3423E+05	8.9090E-03	0.000E+00	4.872E+01
2.720606E-02	1.86010E+01	1.1076E+01	1.0387E+05	1.1304E-02	0.000E+00	4.557E+01
2.908327E-02	1.89102E+01	9.2885E+00	8.1485E+04	1.4275E-02	0.000E+00	4.263E+01
3.109002E-02	1.88728E+01	7.9449E+00	6.5200E+04	1.7943E-02	0.000E+00	3.988E+01
3.323523E-02	1.86521E+01	6.9671E+00	5.3485E+04	2.2449E-02	0.000E+00	3.731E+01
3.552846E-02	1.83458E+01	6.2858E+00	4.5140E+04	2.7958E-02	0.000E+00	3.490E+01
3.797993E-02	1.80125E+01	5.8440E+00	3.9258E+04	3.4659E-02	0.000E+00	3.264E+01
4.060054E-02	1.76872E+01	5.5958E+00	3.5165E+04	4.2770E-02	0.000E+00	3.054E+01
4.340198E-02	1.73911E+01	5.5061E+00	3.2368E+04	5.2542E-02	0.000E+00	2.857E+01
4.639671E-02	1.71367E+01	5.5480E+00	3.0509E+04	6.4256E-02	0.000E+00	2.672E+01
4.959809E-02	1.69294E+01	5.7012E+00	2.9328E+04	7.8231E-02	0.000E+00	2.500E+01
5.017600E-02	1.68969E+01	5.7380E+00	2.9177E+04	8.0914E-02	0.000E+00	2.471E+01
5.094400E-02	1.68496E+01	5.7905E+00	2.9000E+04	8.4554E-02	0.000E+00	2.434E+01
5.114880E-02	1.68262E+01	5.8051E+00	2.8957E+04	8.5539E-02	0.000E+00	2.424E+01
5.145600E-02	1.68282E+01	5.8567E+00	2.9040E+04	8.7028E-02	0.000E+00	2.410E+01
5.222400E-02	1.68126E+01	5.9165E+00	2.8905E+04	9.0811E-02	0.000E+00	2.374E+01
5.302035E-02	1.67927E+01	5.9822E+00	2.8787E+04	9.4824E-02	0.000E+00	2.338E+01
5.667876E-02	1.67390E+01	6.3228E+00	2.8462E+04	1.1443E-01	0.000E+00	2.187E+01
6.058959E-02	1.67654E+01	6.7412E+00	2.8387E+04	1.3749E-01	0.000E+00	2.046E+01
6.477028E-02	1.69116E+01	7.2311E+00	2.8485E+04	1.6447E-01	0.000E+00	1.914E+01
6.923942E-02	1.71692E+01	7.7880E+00	2.8698E+04	1.9591E-01	0.000E+00	1.791E+01
7.401695E-02	1.75279E+01	8.0914E+00	2.7892E+04	2.3235E-01	0.000E+00	1.675E+01
7.912411E-02	1.79004E+01	8.3762E+00	2.7010E+04	2.7440E-01	0.000E+00	1.567E+01
8.458368E-02	1.82919E+01	8.6510E+00	2.6095E+04	3.2270E-01	0.000E+00	1.466E+01
9.041995E-02	1.87022E+01	8.9095E+00	2.5140E+04	3.7790E-01	0.000E+00	1.371E+01
9.665893E-02	1.91268E+01	9.1457E+00	2.4141E+04	4.4070E-01	0.000E+00	1.283E+01
1.033284E-01	1.95572E+01	9.3540E+00	2.3097E+04	5.1181E-01	0.000E+00	1.200E+01
1.104581E-01	1.99799E+01	9.5299E+00	2.2012E+04	5.9195E-01	0.000E+00	1.122E+01
1.180797E-01	2.03735E+01	9.6695E+00	2.0893E+04	6.8185E-01	0.000E+00	1.050E+01
1.262272E-01	2.07016E+01	9.7699E+00	1.9748E+04	7.8223E-01	0.000E+00	9.822E+00
1.349368E-01	2.08902E+01	9.8290E+00	1.8585E+04	8.9378E-01	0.000E+00	9.188E+00
1.442475E-01	2.07425E+01	9.8456E+00	1.7415E+04	1.0172E+00	0.000E+00	8.595E+00

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.542005E-01	1.93300E+01	9.8194E+00	1.6247E+04	1.1530E+00	0.000E+00	8.040E+00
1.577800E-01	1.73733E+01	9.8005E+00	1.5848E+04	1.2027E+00	0.000E+00	7.858E+00
1.601950E-01	1.25394E+01	9.7853E+00	1.5585E+04	1.2365E+00	0.000E+00	7.740E+00
1.608390E-01	5.84848E+00	9.7809E+00	1.5516E+04	1.2455E+00	0.000E+00	7.709E+00
1.618050E-01	1.42772E+01	2.3338E+01	3.6801E+04	1.2591E+00	0.000E+00	7.663E+00
1.642200E-01	2.15614E+01	2.1227E+01	3.2980E+04	1.2931E+00	0.000E+00	7.550E+00
1.648404E-01	2.24690E+01	2.0744E+01	3.2107E+04	1.3019E+00	0.000E+00	7.521E+00
1.762144E-01	2.76496E+01	1.4810E+01	2.1443E+04	1.4642E+00	0.000E+00	7.036E+00
1.883732E-01	2.78923E+01	1.2203E+01	1.6528E+04	1.6404E+00	0.000E+00	6.582E+00
2.013709E-01	2.78025E+01	1.1089E+01	1.4050E+04	1.8307E+00	0.000E+00	6.157E+00
2.152655E-01	2.77907E+01	1.0487E+01	1.2499E+04	2.0353E+00	0.000E+00	5.760E+00
2.301188E-01	2.78333E+01	1.0095E+01	1.1192E+04	2.2543E+00	0.000E+00	5.388E+00
2.459970E-01	2.78851E+01	9.8090E+00	1.0174E+04	2.4874E+00	0.000E+00	5.040E+00
2.629708E-01	2.79029E+01	9.5922E+00	9.3065E+03	2.7345E+00	0.000E+00	4.715E+00
2.811158E-01	2.78272E+01	9.4319E+00	8.5604E+03	2.9949E+00	0.000E+00	4.410E+00
3.005128E-01	2.73873E+01	9.3256E+00	7.9176E+03	3.2682E+00	0.000E+00	4.126E+00
3.050670E-01	2.68873E+01	9.3091E+00	7.7855E+03	3.3315E+00	0.000E+00	4.064E+00
3.062934E-01	2.62919E+01	9.3051E+00	7.7511E+03	3.3485E+00	0.000E+00	4.048E+00
3.081330E-01	2.68888E+01	1.0468E+01	8.6675E+03	3.3739E+00	0.000E+00	4.024E+00
3.127320E-01	2.74100E+01	1.0468E+01	8.5406E+03	3.4372E+00	0.000E+00	3.965E+00
3.212482E-01	2.77462E+01	1.0477E+01	8.3208E+03	3.5534E+00	0.000E+00	3.859E+00
3.366300E-01	2.79815E+01	1.0512E+01	7.9674E+03	3.7600E+00	0.000E+00	3.683E+00
3.417825E-01	2.79253E+01	1.0529E+01	7.8599E+03	3.8282E+00	0.000E+00	3.628E+00
3.434143E-01	2.76347E+01	1.0535E+01	7.8269E+03	3.8496E+00	0.000E+00	3.610E+00
3.452175E-01	2.79796E+01	1.0875E+01	8.0374E+03	3.8733E+00	0.000E+00	3.591E+00
3.503700E-01	2.82058E+01	1.0900E+01	7.9375E+03	3.9406E+00	0.000E+00	3.539E+00
3.671099E-01	2.85761E+01	1.0992E+01	7.6394E+03	4.1556E+00	0.000E+00	3.377E+00
3.924405E-01	2.89769E+01	1.1150E+01	7.2487E+03	4.4700E+00	0.000E+00	3.159E+00
4.195189E-01	2.92886E+01	1.1322E+01	6.8857E+03	4.7913E+00	0.000E+00	2.955E+00
4.269860E-01	2.93147E+01	1.1367E+01	6.7925E+03	4.8772E+00	0.000E+00	2.904E+00
4.335215E-01	2.91965E+01	1.1406E+01	6.7128E+03	4.9514E+00	0.000E+00	2.860E+00
4.352643E-01	2.89589E+01	1.1416E+01	6.6918E+03	4.9710E+00	0.000E+00	2.848E+00
4.378785E-01	2.92696E+01	1.1953E+01	6.9647E+03	5.0004E+00	0.000E+00	2.831E+00
4.444140E-01	2.96111E+01	1.1993E+01	6.8850E+03	5.0731E+00	0.000E+00	2.790E+00
4.484657E-01	2.97442E+01	1.2016E+01	6.8363E+03	5.1178E+00	0.000E+00	2.765E+00
4.794098E-01	3.04841E+01	1.2173E+01	6.4782E+03	5.4476E+00	0.000E+00	2.586E+00
5.124891E-01	3.11589E+01	1.2281E+01	6.1142E+03	5.7788E+00	0.000E+00	2.419E+00
5.478508E-01	3.17986E+01	1.2325E+01	5.7400E+03	6.1093E+00	0.000E+00	2.263E+00
5.856525E-01	3.24087E+01	1.2295E+01	5.3565E+03	6.4369E+00	0.000E+00	2.117E+00
6.260625E-01	3.29687E+01	1.2188E+01	4.9672E+03	6.7595E+00	0.000E+00	1.980E+00
6.692609E-01	3.34537E+01	1.2004E+01	4.5762E+03	7.0747E+00	0.000E+00	1.853E+00
7.154399E-01	3.38281E+01	1.1740E+01	4.1868E+03	7.3804E+00	0.000E+00	1.733E+00
7.648052E-01	3.40529E+01	1.1411E+01	3.8067E+03	7.6743E+00	0.000E+00	1.621E+00
8.175768E-01	3.40838E+01	1.1035E+01	3.4436E+03	7.9542E+00	0.000E+00	1.516E+00
8.739896E-01	3.38717E+01	1.0631E+01	3.1034E+03	8.2179E+00	0.000E+00	1.419E+00
9.342948E-01	3.33445E+01	1.0213E+01	2.7890E+03	8.4636E+00	0.000E+00	1.327E+00
9.987612E-01	3.23799E+01	9.7932E+00	2.5017E+03	8.6894E+00	0.000E+00	1.241E+00
1.067676E+00	3.08224E+01	9.0662E+00	2.1665E+03	8.8935E+00	0.000E+00	1.161E+00
1.141345E+00	2.77041E+01	8.3982E+00	1.8774E+03	9.0744E+00	0.000E+00	1.086E+00
1.220098E+00	2.12408E+01	7.7896E+00	1.6289E+03	9.2309E+00	0.000E+00	1.016E+00
1.304285E+00	6.31900E-01	7.2138E+00	1.4111E+03	9.3618E+00	0.000E+00	9.506E-01
1.324372E+00	-1.45114E+01	7.0890E+00	1.3657E+03	9.3881E+00	0.000E+00	9.362E-01
1.344643E+00	-6.42263E+01	6.9676E+00	1.3221E+03	9.4128E+00	0.000E+00	9.221E-01
1.350049E+00	-1.41395E+02	6.9359E+00	1.3108E+03	9.4191E+00	0.000E+00	9.184E-01
1.358157E+00	-1.80975E+02	1.5594E+02	2.9295E+04	9.4284E+00	0.000E+00	9.129E-01
1.363670E+00	1.64030E+01	1.2907E+02	2.4148E+04	9.4345E+00	0.000E+00	9.092E-01
1.378428E+00	3.31267E+01	7.8878E+01	1.4600E+04	9.4503E+00	0.000E+00	8.995E-01
1.384542E+00	2.02473E+01	6.4781E+01	1.1938E+04	9.4566E+00	0.000E+00	8.955E-01
1.390108E+00	-3.05579E+01	5.4388E+01	9.9823E+03	9.4622E+00	0.000E+00	8.919E-01
1.394781E+00	1.16713E+01	1.6486E+02	3.0167E+04	9.4663E+00	0.000E+00	8.897E-01
1.398457E+00	5.37050E+01	1.4306E+02	2.5101E+04	9.4703E+00	0.000E+00	8.866E-01
1.419330E+00	9.06918E+01	7.2508E+01	1.3034E+04	9.4896E+00	0.000E+00	8.735E-01
1.490486E+00	6.18787E+01	2.3326E+01	3.9928E+03	9.5436E+00	0.000E+00	8.318E-01
1.593329E+00	4.75445E+01	2.0640E+01	3.3052E+03	9.5935E+00	0.000E+00	7.781E-01
1.703269E+00	4.20407E+01	2.3439E+01	3.5110E+03	9.6158E+00	0.000E+00	7.279E-01

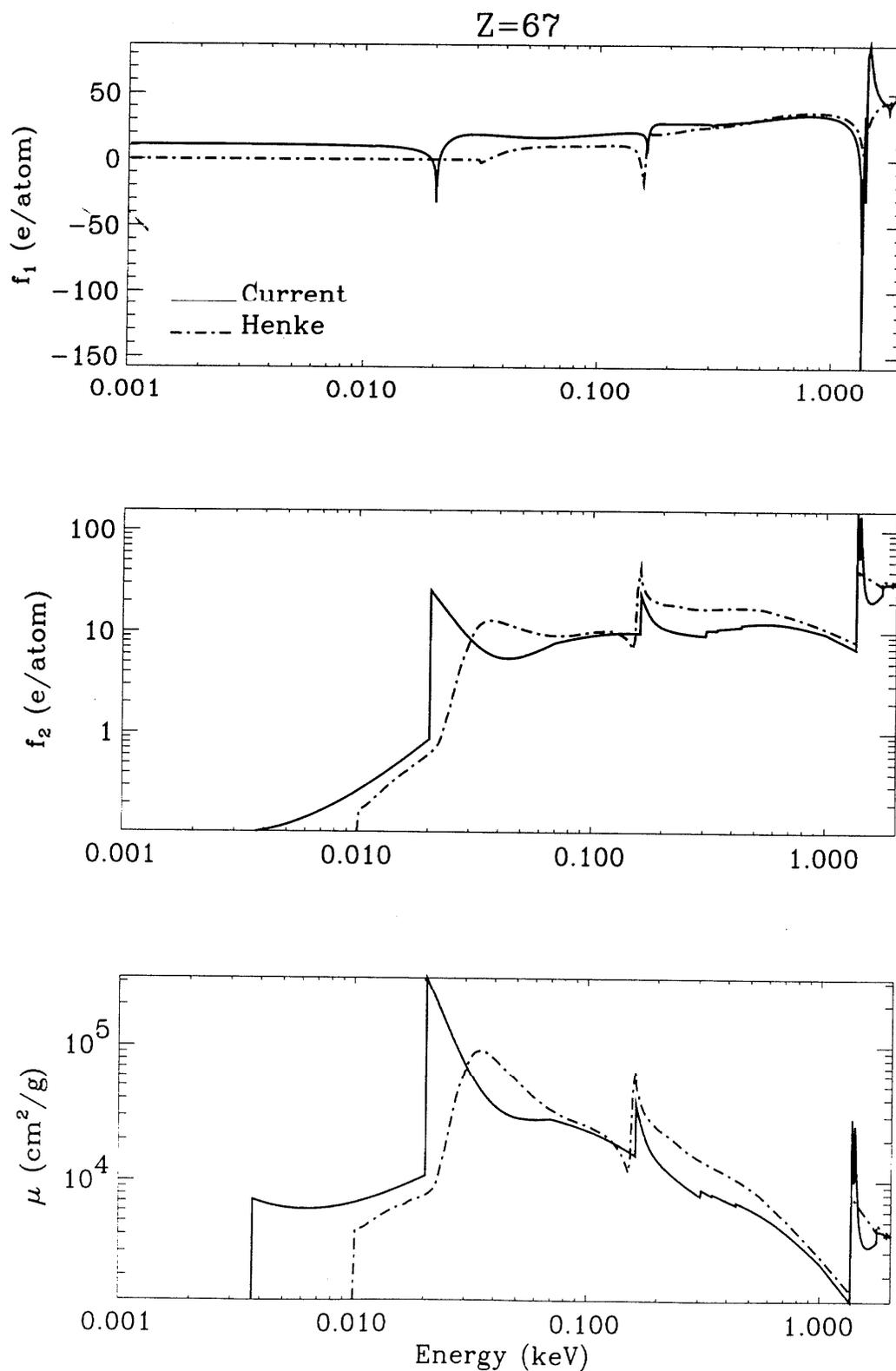
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 469

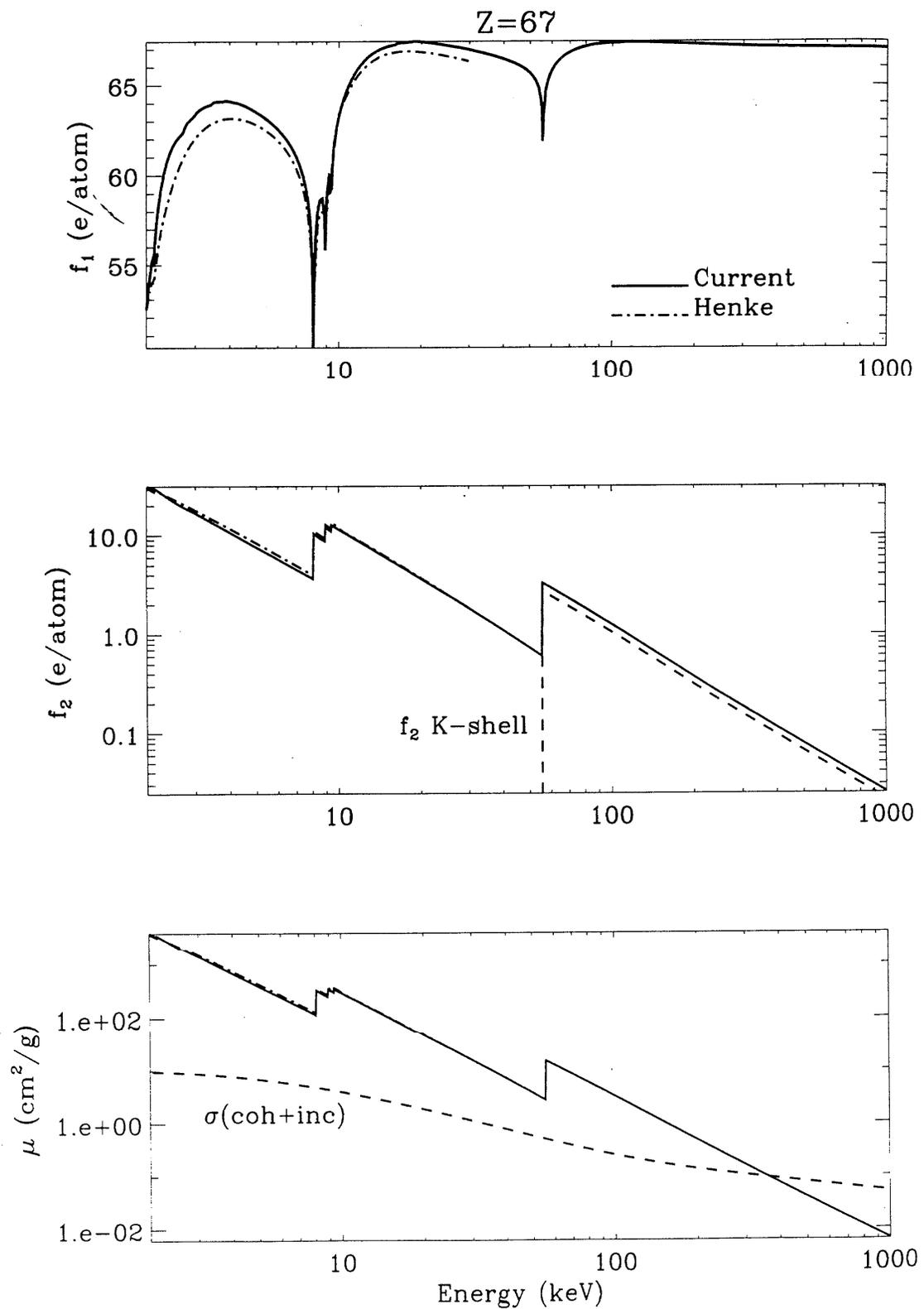
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
1.706376E+00	4.19047E+01	2.3545E+01	3.5205E+03	9.6160E+00	0.000E+00	7.266E-01
1.732494E+00	3.99636E+01	2.4458E+01	3.6019E+03	9.6171E+00	0.000E+00	7.156E-01
1.739459E+00	3.76642E+01	2.4704E+01	3.6236E+03	9.6171E+00	0.000E+00	7.128E-01
1.749906E+00	4.02175E+01	2.9719E+01	4.3331E+03	9.6170E+00	0.000E+00	7.085E-01
1.776024E+00	4.28848E+01	3.0188E+01	4.3367E+03	9.6157E+00	0.000E+00	6.981E-01
1.820795E+00	4.51964E+01	3.0670E+01	4.2976E+03	9.6106E+00	0.000E+00	6.809E-01
1.884344E+00	4.74864E+01	3.0782E+01	4.1678E+03	9.5973E+00	0.000E+00	6.580E-01
1.913186E+00	4.79068E+01	3.0665E+01	4.0895E+03	9.5891E+00	0.000E+00	6.481E-01
1.920877E+00	4.72635E+01	3.0611E+01	4.0658E+03	9.5867E+00	0.000E+00	6.455E-01
1.932414E+00	4.87097E+01	3.2405E+01	4.2784E+03	9.5830E+00	0.000E+00	6.416E-01
1.946430E+00	4.98232E+01	3.2230E+01	4.2247E+03	9.5782E+00	0.000E+00	6.370E-01
1.961256E+00	5.06870E+01	3.2021E+01	4.1656E+03	9.5728E+00	0.000E+00	6.322E-01
2.080733E+00	5.50016E+01	2.9736E+01	3.6463E+03	9.5191E+00	0.000E+00	5.959E-01
2.085734E+00	5.51130E+01	2.9626E+01	3.6240E+03	9.5165E+00	0.000E+00	5.944E-01
2.117658E+00	5.55042E+01	2.8905E+01	3.4826E+03	9.4992E+00	0.000E+00	5.855E-01
2.126172E+00	5.51242E+01	2.8709E+01	3.4451E+03	9.4944E+00	0.000E+00	5.831E-01
2.138941E+00	5.60457E+01	2.9592E+01	3.5299E+03	9.4871E+00	0.000E+00	5.797E-01
2.170866E+00	5.73034E+01	2.8833E+01	3.3887E+03	9.4681E+00	0.000E+00	5.711E-01
2.224304E+00	5.86269E+01	2.7572E+01	3.1626E+03	9.4343E+00	0.000E+00	5.574E-01
2.377781E+00	6.08019E+01	2.4243E+01	2.6013E+03	9.3246E+00	0.000E+00	5.214E-01
2.541848E+00	6.18372E+01	2.1455E+01	2.1535E+03	9.1912E+00	0.000E+00	4.878E-01
2.717235E+00	6.25534E+01	1.9284E+01	1.8107E+03	9.0355E+00	0.000E+00	4.563E-01
2.904724E+00	6.31265E+01	1.7598E+01	1.5457E+03	8.8589E+00	0.000E+00	4.268E-01
3.105150E+00	6.36266E+01	1.5961E+01	1.3114E+03	8.6631E+00	0.000E+00	3.993E-01
3.319406E+00	6.38668E+01	1.4381E+01	1.1054E+03	8.4497E+00	0.000E+00	3.735E-01
3.548445E+00	6.40894E+01	1.2969E+01	9.3248E+02	8.2206E+00	0.000E+00	3.494E-01
3.793288E+00	6.41076E+01	1.1683E+01	7.8582E+02	7.9776E+00	0.000E+00	3.269E-01
4.055024E+00	6.40956E+01	1.0520E+01	6.6190E+02	7.7225E+00	0.000E+00	3.058E-01
4.334821E+00	6.39832E+01	9.4779E+00	5.5785E+02	7.4573E+00	0.000E+00	2.860E-01
4.633924E+00	6.37889E+01	8.5432E+00	4.7038E+02	7.1838E+00	0.000E+00	2.676E-01
4.953664E+00	6.35420E+01	7.7110E+00	3.9716E+02	6.9038E+00	0.000E+00	2.503E-01
5.295467E+00	6.32455E+01	6.9692E+00	3.3578E+02	6.6191E+00	0.000E+00	2.341E-01
5.660855E+00	6.28946E+01	6.3070E+00	2.8426E+02	6.3315E+00	0.000E+00	2.190E-01
6.051453E+00	6.24720E+01	5.7000E+00	2.4032E+02	6.0426E+00	0.000E+00	2.049E-01
6.469004E+00	6.19213E+01	5.1362E+00	2.0257E+02	5.7540E+00	0.000E+00	1.917E-01
6.915365E+00	6.11594E+01	4.6345E+00	1.7099E+02	5.4670E+00	0.000E+00	1.793E-01
7.392525E+00	5.99548E+01	4.1893E+00	1.4459E+02	5.1832E+00	0.000E+00	1.677E-01
7.902609E+00	5.69139E+01	3.7812E+00	1.2208E+02	4.9037E+00	0.000E+00	1.569E-01
7.909678E+00	5.68216E+01	3.7760E+00	1.2180E+02	4.8999E+00	0.000E+00	1.568E-01
8.030745E+00	5.38366E+01	3.6885E+00	1.1719E+02	4.8370E+00	0.000E+00	1.544E-01
8.063029E+00	5.03421E+01	3.6658E+00	1.1600E+02	4.8205E+00	0.000E+00	1.538E-01
8.111456E+00	5.38428E+01	1.0452E+01	3.2876E+02	4.7958E+00	0.000E+00	1.529E-01
8.232522E+00	5.68834E+01	1.0119E+01	3.1360E+02	4.7349E+00	0.000E+00	1.506E-01
8.447890E+00	5.84369E+01	9.5635E+00	2.8883E+02	4.6295E+00	0.000E+00	1.468E-01
8.739444E+00	5.86150E+01	9.0214E+00	2.6337E+02	4.4925E+00	0.000E+00	1.419E-01
8.873211E+00	5.75023E+01	8.8050E+00	2.5318E+02	4.4318E+00	0.000E+00	1.397E-01
8.908882E+00	5.58405E+01	8.7477E+00	2.5052E+02	4.4158E+00	0.000E+00	1.392E-01
8.962389E+00	5.77058E+01	1.2075E+01	3.4374E+02	4.3920E+00	0.000E+00	1.383E-01
9.030794E+00	5.88604E+01	1.1899E+01	3.3617E+02	4.3618E+00	0.000E+00	1.373E-01
9.096156E+00	5.94438E+01	1.1735E+01	3.2915E+02	4.3333E+00	0.000E+00	1.363E-01
9.206316E+00	5.99990E+01	1.1465E+01	3.1774E+02	4.2859E+00	0.000E+00	1.347E-01
9.347229E+00	5.99731E+01	1.1132E+01	3.0386E+02	4.2264E+00	0.000E+00	1.326E-01
9.384806E+00	5.92505E+01	1.1049E+01	3.0040E+02	4.2108E+00	0.000E+00	1.321E-01
9.441171E+00	6.03395E+01	1.2653E+01	3.4194E+02	4.1875E+00	0.000E+00	1.313E-01
9.582084E+00	6.15929E+01	1.2348E+01	3.2880E+02	4.1301E+00	0.000E+00	1.294E-01
9.653919E+00	6.19877E+01	1.2198E+01	3.2238E+02	4.1014E+00	0.000E+00	1.284E-01
1.032004E+01	6.40767E+01	1.0941E+01	2.7049E+02	3.8490E+00	0.000E+00	1.201E-01
1.103212E+01	6.52185E+01	9.8237E+00	2.2719E+02	3.6052E+00	0.000E+00	1.124E-01
1.179334E+01	6.59704E+01	8.8246E+00	1.9091E+02	3.3707E+00	0.000E+00	1.051E-01
1.260708E+01	6.64794E+01	7.9097E+00	1.6007E+02	3.1457E+00	0.000E+00	9.834E-02
1.347697E+01	6.68189E+01	7.0859E+00	1.3415E+02	2.9307E+00	0.000E+00	9.200E-02
1.440688E+01	6.70426E+01	6.3487E+00	1.1243E+02	2.7257E+00	0.000E+00	8.606E-02
1.540095E+01	6.71849E+01	5.6900E+00	9.4263E+01	2.5310E+00	0.000E+00	8.050E-02
1.646362E+01	6.73367E+01	5.0967E+00	7.8985E+01	2.3465E+00	0.000E+00	7.531E-02
1.759961E+01	6.75708E+01	4.5570E+00	6.6063E+01	2.1723E+00	0.000E+00	7.045E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.881398E+01	6.74348E+01	4.0737E+00	5.5244E+01	2.0082E+00	0.000E+00	6.590E-02
2.011215E+01	6.74038E+01	3.6352E+00	4.6116E+01	1.8539E+00	0.000E+00	6.165E-02
2.149988E+01	6.73504E+01	3.2468E+00	3.8530E+01	1.7095E+00	0.000E+00	5.767E-02
2.298338E+01	6.72834E+01	2.9024E+00	3.2220E+01	1.5744E+00	0.000E+00	5.395E-02
2.456923E+01	6.72083E+01	2.5968E+00	2.6967E+01	1.4485E+00	0.000E+00	5.046E-02
2.626450E+01	6.71306E+01	2.3254E+00	2.2590E+01	1.3314E+00	0.000E+00	4.721E-02
2.807676E+01	6.70572E+01	2.0677E+00	1.8790E+01	1.2227E+00	0.000E+00	4.416E-02
3.001405E+01	6.69602E+01	1.8352E+00	1.5600E+01	1.1221E+00	0.000E+00	4.131E-02
3.208502E+01	6.68537E+01	1.6301E+00	1.2962E+01	1.0292E+00	0.000E+00	3.864E-02
3.429889E+01	6.67401E+01	1.4491E+00	1.0780E+01	9.4351E-01	0.000E+00	3.615E-02
3.666551E+01	6.66184E+01	1.2871E+00	8.9566E+00	8.6470E-01	0.000E+00	3.381E-02
3.919543E+01	6.64839E+01	1.1426E+00	7.4375E+00	7.9234E-01	0.000E+00	3.163E-02
4.189992E+01	6.63296E+01	1.0121E+00	6.1627E+00	7.2603E-01	0.000E+00	2.959E-02
4.479101E+01	6.61395E+01	8.9477E-01	5.0968E+00	6.6538E-01	0.000E+00	2.768E-02
4.788159E+01	6.58829E+01	7.9118E-01	4.2158E+00	6.1000E-01	0.000E+00	2.589E-02
5.118542E+01	6.54662E+01	7.0001E-01	3.4893E+00	5.5952E-01	0.000E+00	2.422E-02
5.450534E+01	6.43897E+01	6.2421E-01	2.9219E+00	5.1613E-01	0.000E+00	2.275E-02
5.471721E+01	6.42184E+01	6.1983E-01	2.8902E+00	5.1357E-01	0.000E+00	2.266E-02
5.533961E+01	6.32423E+01	6.0722E-01	2.7996E+00	5.0621E-01	0.000E+00	2.240E-02
5.556208E+01	6.18682E+01	6.0281E-01	2.7681E+00	5.0362E-01	0.000E+00	2.231E-02
5.589579E+01	6.32566E+01	3.3013E+00	1.5069E+01	4.9979E-01	1.235E+01	2.218E-02
5.673005E+01	6.45109E+01	3.2271E+00	1.4514E+01	4.9046E-01	1.190E+01	2.186E-02
5.849270E+01	6.53995E+01	3.0790E+00	1.3430E+01	4.7181E-01	1.103E+01	2.120E-02
6.252870E+01	6.62164E+01	2.7650E+00	1.1282E+01	4.3391E-01	9.295E+00	1.983E-02
6.684318E+01	6.66288E+01	2.4787E+00	9.4613E+00	3.9954E-01	7.812E+00	1.855E-02
7.145536E+01	6.68827E+01	2.2211E+00	7.9308E+00	3.6843E-01	6.560E+00	1.735E-02
7.638578E+01	6.70512E+01	1.9890E+00	6.6437E+00	3.4027E-01	5.504E+00	1.623E-02
8.165640E+01	6.71685E+01	1.7786E+00	5.5572E+00	3.1482E-01	4.612E+00	1.518E-02
8.729069E+01	6.72458E+01	1.5856E+00	4.6344E+00	2.9183E-01	3.855E+00	1.420E-02
9.331374E+01	6.72943E+01	1.4137E+00	3.8653E+00	2.7106E-01	3.222E+00	1.329E-02
9.975239E+01	6.73236E+01	1.2606E+00	3.2243E+00	2.5231E-01	2.693E+00	1.243E-02
1.066353E+02	6.73395E+01	1.1242E+00	2.6899E+00	2.3537E-01	2.250E+00	1.163E-02
1.139931E+02	6.73751E+01	1.0012E+00	2.2408E+00	2.2007E-01	1.877E+00	1.088E-02
1.218587E+02	6.73719E+01	8.8923E-01	1.8618E+00	2.0624E-01	1.561E+00	1.017E-02
1.302669E+02	6.73624E+01	7.8989E-01	1.5471E+00	1.9373E-01	1.298E+00	9.518E-03
1.392553E+02	6.73488E+01	7.0172E-01	1.2857E+00	1.8240E-01	1.079E+00	8.903E-03
1.488640E+02	6.73325E+01	6.2345E-01	1.0685E+00	1.7212E-01	8.976E-01	8.329E-03
1.591356E+02	6.73146E+01	5.5395E-01	8.8815E-01	1.6278E-01	7.463E-01	7.791E-03
1.701159E+02	6.72959E+01	4.9225E-01	7.3828E-01	1.5427E-01	6.206E-01	7.288E-03
1.818539E+02	6.72768E+01	4.3746E-01	6.1375E-01	1.4649E-01	5.160E-01	6.818E-03
1.944018E+02	6.72578E+01	3.8879E-01	5.1027E-01	1.3938E-01	4.291E-01	6.378E-03
2.078156E+02	6.72390E+01	3.4557E-01	4.2427E-01	1.3284E-01	3.568E-01	5.966E-03
2.221548E+02	6.72208E+01	3.0718E-01	3.5279E-01	1.2681E-01	2.967E-01	5.581E-03
2.374835E+02	6.72031E+01	2.7307E-01	2.9337E-01	1.2124E-01	2.467E-01	5.221E-03
2.538699E+02	6.71863E+01	2.4378E-01	2.4500E-01	1.1606E-01	2.062E-01	4.884E-03
2.713869E+02	6.71709E+01	2.1790E-01	2.0485E-01	1.1123E-01	1.725E-01	4.569E-03
2.901126E+02	6.71568E+01	1.9478E-01	1.7130E-01	1.0671E-01	1.444E-01	4.274E-03
3.101304E+02	6.71436E+01	1.7413E-01	1.4325E-01	1.0246E-01	1.208E-01	3.998E-03
3.315294E+02	6.71315E+01	1.5567E-01	1.1980E-01	9.8455E-02	1.011E-01	3.740E-03
3.544049E+02	6.71203E+01	1.3919E-01	1.0020E-01	9.4657E-02	8.459E-02	3.498E-03
3.788588E+02	6.71099E+01	1.2445E-01	8.3811E-02	9.1045E-02	7.079E-02	3.273E-03
4.050001E+02	6.71004E+01	1.1128E-01	7.0106E-02	8.7599E-02	5.924E-02	3.061E-03
4.329451E+02	6.70916E+01	9.9514E-02	5.8645E-02	8.4301E-02	4.957E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 473

Er Z = 68

Atomic weight = 1.672600E+02 g/mol, nominal density ρ (g/cm³) = 9.0390E+00

μ_a (barns/atom) = μ (cm²/g) \times 2.77742E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.51586E+05

19 edges. Edge energies (keV):

K		5.74855E+00	L	I	9.75130E+00	L	II	9.26430E+00	L	III	8.35790E+00
M	I	2.20650E+00	M	II	2.00580E+00	M	III	1.81180E+00	M	IV	1.45330E+00
M	V	1.40930E+00	N	I	4.49100E-00	N	II	3.66200E-00	N	III	3.20000E-01
N	IV	1.78700E-00	N	V	1.67600E-00	O	I	4.30000E-03	O	II	4.30000E-03
O	III	5.98000E-02	N	VI	2.94000E-02	N	VII	2.94000E-02			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.1649E+00, -6.9660E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.5166E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
4.214000E-03	1.13349E+01	0.0000E+00	0.0000E+00	2.2241E-06	0.000E+00	2.942E+02
4.278500E-03	1.12763E+01	0.0000E+00	0.0000E+00	2.4241E-06	0.000E+00	2.898E+02
4.295700E-03	1.12116E+01	0.0000E+00	0.0000E+00	2.4798E-06	0.000E+00	2.886E+02
4.321500E-03	1.12735E+01	1.2433E-01	7.2383E+03	2.5651E-06	0.000E+00	2.869E+02
4.386000E-03	1.13244E+01	1.2488E-01	7.1632E+03	2.7886E-06	0.000E+00	2.827E+02
1.069000E-02	1.09260E+01	2.8242E-01	6.6467E+03	2.6006E-04	0.000E+00	1.160E+02
1.142761E-02	1.08355E+01	3.1136E-01	6.8548E+03	3.5179E-04	0.000E+00	1.085E+02
1.221612E-02	1.07304E+01	3.4450E-01	7.0949E+03	4.7346E-04	0.000E+00	1.015E+02
1.305903E-02	1.10140E+01	3.8246E-01	7.3683E+03	6.3399E-04	0.000E+00	9.494E+01
1.396010E-02	1.08707E+01	4.2594E-01	7.6763E+03	8.4469E-04	0.000E+00	8.881E+01
1.492335E-02	1.07017E+01	4.7574E-01	8.0203E+03	1.1198E-03	0.000E+00	8.308E+01
1.595306E-02	1.05009E+01	5.3277E-01	8.4020E+03	1.4772E-03	0.000E+00	7.772E+01
1.705382E-02	1.02594E+01	5.9806E-01	8.8228E+03	1.9390E-03	0.000E+00	7.270E+01
1.823053E-02	9.96477E+00	6.7274E-01	9.2840E+03	2.5327E-03	0.000E+00	6.801E+01
1.948844E-02	9.59762E+00	7.5803E-01	9.7858E+03	3.2922E-03	0.000E+00	6.362E+01
2.083314E-02	9.12687E+00	8.5526E-01	1.0328E+04	4.2586E-03	0.000E+00	5.951E+01
2.227063E-02	8.49800E+00	9.6593E-01	1.0912E+04	5.4822E-03	0.000E+00	5.567E+01
2.380730E-02	7.60417E+00	1.0916E+00	1.1536E+04	7.0237E-03	0.000E+00	5.208E+01
2.545001E-02	6.19628E+00	1.2341E+00	1.2200E+04	8.9559E-03	0.000E+00	4.872E+01
2.720606E-02	3.47413E+00	1.3952E+00	1.2902E+04	1.1366E-02	0.000E+00	4.557E+01
2.881200E-02	-3.98499E+00	1.5500E+00	1.3535E+04	1.3897E-02	0.000E+00	4.303E+01
2.908327E-02	-7.97707E+00	1.5769E+00	1.3641E+04	1.4356E-02	0.000E+00	4.263E+01
2.925300E-02	-1.32047E+01	1.5937E+00	1.3707E+04	1.4648E-02	0.000E+00	4.238E+01
2.937060E-02	-2.47216E+01	1.6055E+00	1.3752E+04	1.4853E-02	0.000E+00	4.221E+01
2.954700E-02	-1.20411E+01	2.4533E+01	2.0890E+05	1.5163E-02	0.000E+00	4.196E+01
2.998800E-02	-8.20267E-01	2.3362E+01	1.9600E+05	1.5956E-02	0.000E+00	4.134E+01
3.109002E-02	8.00407E+00	2.0782E+01	1.6817E+05	1.8049E-02	0.000E+00	3.988E+01
3.232523E-02	1.41917E+01	1.6869E+01	1.2770E+05	2.2586E-02	0.000E+00	3.731E+01
3.552846E-02	1.67708E+01	1.3748E+01	9.7355E+04	2.8134E-02	0.000E+00	3.490E+01
3.797993E-02	1.78228E+01	1.1346E+01	7.5159E+04	3.4885E-02	0.000E+00	3.264E+01
4.060054E-02	1.81090E+01	9.5843E+00	5.9391E+04	4.3058E-02	0.000E+00	3.054E+01
4.340198E-02	1.80104E+01	8.3567E+00	4.8441E+04	5.2906E-02	0.000E+00	2.857E+01
4.639671E-02	1.77364E+01	7.5582E+00	4.0984E+04	6.4716E-02	0.000E+00	2.672E+01
4.959809E-02	1.74051E+01	7.0975E+00	3.6002E+04	7.8808E-02	0.000E+00	2.500E+01
5.302035E-02	1.70826E+01	6.9015E+00	3.2748E+04	9.5544E-02	0.000E+00	2.338E+01
5.667876E-02	1.68045E+01	6.9136E+00	3.0688E+04	1.1532E-01	0.000E+00	2.187E+01
5.860400E-02	1.66851E+01	6.9842E+00	2.9983E+04	1.2651E-01	0.000E+00	2.116E+01
5.950100E-02	1.66278E+01	7.0288E+00	2.9720E+04	1.3190E-01	0.000E+00	2.084E+01
5.974020E-02	1.66014E+01	7.0418E+00	2.9656E+04	1.3336E-01	0.000E+00	2.075E+01
6.009900E-02	1.66008E+01	7.0928E+00	2.9692E+04	1.3556E-01	0.000E+00	2.063E+01
6.058959E-02	1.65898E+01	7.1229E+00	2.9576E+04	1.3859E-01	0.000E+00	2.046E+01
6.099600E-02	1.65783E+01	7.1492E+00	2.9488E+04	1.4113E-01	0.000E+00	2.033E+01
6.477028E-02	1.64960E+01	7.4422E+00	2.8907E+04	1.6583E-01	0.000E+00	1.914E+01
6.923942E-02	1.64964E+01	7.8749E+00	2.8614E+04	1.9757E-01	0.000E+00	1.791E+01
7.401695E-02	1.66185E+01	8.4045E+00	2.8567E+04	2.3437E-01	0.000E+00	1.675E+01
7.912411E-02	1.68920E+01	9.0191E+00	2.8678E+04	2.7685E-01	0.000E+00	1.567E+01
8.458368E-02	1.73191E+01	9.4355E+00	2.8065E+04	3.2565E-01	0.000E+00	1.466E+01
9.041995E-02	1.77819E+01	9.7393E+00	2.7099E+04	3.8144E-01	0.000E+00	1.371E+01
9.665893E-02	1.82536E+01	1.0030E+01	2.6105E+04	4.4492E-01	0.000E+00	1.283E+01
1.033284E-01	1.87431E+01	1.0298E+01	2.5073E+04	5.1683E-01	0.000E+00	1.200E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.104581E-01	1.92426E+01	1.0536E+01	2.3997E+04	5.9790E-01	0.000E+00	1.122E+01
1.180797E-01	1.97383E+01	1.0738E+01	2.2879E+04	6.8886E-01	0.000E+00	1.050E+01
1.262272E-01	2.02077E+01	1.0900E+01	2.1724E+04	7.9045E-01	0.000E+00	9.822E+00
1.349368E-01	2.06117E+01	1.1017E+01	2.0541E+04	9.0338E-01	0.000E+00	9.188E+00
1.442475E-01	2.08683E+01	1.1087E+01	1.9337E+04	1.0283E+00	0.000E+00	8.595E+00
1.542005E-01	2.07381E+01	1.1108E+01	1.8124E+04	1.1659E+00	0.000E+00	8.040E+00
1.642480E-01	1.88477E+01	1.1083E+01	1.6976E+04	1.3082E+00	0.000E+00	7.549E+00
1.648404E-01	1.84830E+01	1.1080E+01	1.6911E+04	1.3167E+00	0.000E+00	7.521E+00
1.667620E-01	1.59632E+01	1.1070E+01	1.6701E+04	1.3443E+00	0.000E+00	7.435E+00
1.674324E-01	1.20960E+01	1.1066E+01	1.6629E+04	1.3540E+00	0.000E+00	7.405E+00
1.684380E-01	1.68236E+01	1.8812E+01	2.8099E+04	1.3684E+00	0.000E+00	7.361E+00
1.709520E-01	2.06947E+01	1.7621E+01	2.5932E+04	1.4048E+00	0.000E+00	7.253E+00
1.731660E-01	2.16705E+01	1.6730E+01	2.4306E+04	1.4369E+00	0.000E+00	7.160E+00
1.758165E-01	2.08819E+01	1.5824E+01	2.2644E+04	1.4754E+00	0.000E+00	7.052E+00
1.762144E-01	2.01074E+01	1.5701E+01	2.2417E+04	1.4812E+00	0.000E+00	7.036E+00
1.765233E-01	1.86056E+01	1.5608E+01	2.2245E+04	1.4858E+00	0.000E+00	7.024E+00
1.775835E-01	2.19267E+01	2.0296E+01	2.8754E+04	1.5012E+00	0.000E+00	6.982E+00
1.802340E-01	2.50306E+01	1.8880E+01	2.6355E+04	1.5400E+00	0.000E+00	6.879E+00
1.883732E-01	2.74930E+01	1.5793E+01	2.1092E+04	1.6599E+00	0.000E+00	6.582E+00
2.013709E-01	2.80374E+01	1.3371E+01	1.6705E+04	1.8529E+00	0.000E+00	6.157E+00
2.152655E-01	2.80958E+01	1.2282E+01	1.4354E+04	2.0605E+00	0.000E+00	5.760E+00
2.301188E-01	2.81895E+01	1.1674E+01	1.2763E+04	2.2827E+00	0.000E+00	5.388E+00
2.459970E-01	2.83159E+01	1.1264E+01	1.1520E+04	2.5193E+00	0.000E+00	5.040E+00
2.629708E-01	2.84338E+01	1.0956E+01	1.0481E+04	2.7702E+00	0.000E+00	4.715E+00
2.811158E-01	2.84981E+01	1.0713E+01	9.5880E+03	3.0348E+00	0.000E+00	4.410E+00
3.005128E-01	2.84229E+01	1.0527E+01	8.8128E+03	3.3124E+00	0.000E+00	4.126E+00
3.136000E-01	2.81011E+01	1.0435E+01	8.3719E+03	3.4963E+00	0.000E+00	3.954E+00
3.184000E-01	2.76062E+01	1.0408E+01	8.2241E+03	3.5630E+00	0.000E+00	3.894E+00
3.196800E-01	2.70053E+01	1.0401E+01	8.1859E+03	3.5807E+00	0.000E+00	3.878E+00
3.212482E-01	2.75234E+01	1.1580E+01	9.0687E+03	3.6024E+00	0.000E+00	3.859E+00
3.216000E-01	2.76185E+01	1.1579E+01	9.0581E+03	3.6072E+00	0.000E+00	3.855E+00
3.264000E-01	2.81642E+01	1.1569E+01	8.9175E+03	3.6732E+00	0.000E+00	3.799E+00
3.434143E-01	2.87333E+01	1.1557E+01	8.4666E+03	3.9036E+00	0.000E+00	3.610E+00
3.588760E-01	2.89347E+01	1.1571E+01	8.1115E+03	4.1079E+00	0.000E+00	3.455E+00
3.643690E-01	2.88839E+01	1.1580E+01	7.9957E+03	4.1794E+00	0.000E+00	3.403E+00
3.658338E-01	2.87383E+01	1.1583E+01	7.9656E+03	4.1983E+00	0.000E+00	3.389E+00
3.671099E-01	2.88540E+01	1.1917E+01	8.1667E+03	4.2148E+00	0.000E+00	3.377E+00
3.680310E-01	2.89422E+01	1.1919E+01	8.1481E+03	4.2267E+00	0.000E+00	3.369E+00
3.735240E-01	2.91746E+01	1.1937E+01	8.0401E+03	4.2971E+00	0.000E+00	3.319E+00
3.924405E-01	2.95888E+01	1.2008E+01	7.6982E+03	4.5347E+00	0.000E+00	3.159E+00
4.195189E-01	3.00106E+01	1.2126E+01	7.2722E+03	4.8618E+00	0.000E+00	2.955E+00
4.401180E-01	3.01915E+01	1.2217E+01	6.9838E+03	5.1002E+00	0.000E+00	2.817E+00
4.468545E-01	3.00833E+01	1.2246E+01	6.8946E+03	5.1762E+00	0.000E+00	2.775E+00
4.484657E-01	2.99029E+01	1.2252E+01	6.8735E+03	5.1943E+00	0.000E+00	2.765E+00
4.486509E-01	2.98491E+01	1.2253E+01	6.8711E+03	5.1964E+00	0.000E+00	2.763E+00
4.513455E-01	3.01621E+01	1.2784E+01	7.1260E+03	5.2264E+00	0.000E+00	2.747E+00
4.580820E-01	3.05110E+01	1.2814E+01	7.0377E+03	5.3008E+00	0.000E+00	2.707E+00
4.794098E-01	3.10935E+01	1.2900E+01	6.7696E+03	5.5303E+00	0.000E+00	2.586E+00
5.124891E-01	3.18170E+01	1.2995E+01	6.3794E+03	5.8679E+00	0.000E+00	2.419E+00
5.478508E-01	3.25109E+01	1.3035E+01	5.9862E+03	6.2050E+00	0.000E+00	2.263E+00
5.856525E-01	3.31694E+01	1.3006E+01	5.5873E+03	6.5393E+00	0.000E+00	2.117E+00
6.260625E-01	3.37885E+01	1.2902E+01	5.1849E+03	6.8686E+00	0.000E+00	1.980E+00
6.692609E-01	3.43453E+01	1.2723E+01	4.7827E+03	7.1906E+00	0.000E+00	1.853E+00
7.154399E-01	3.48123E+01	1.2467E+01	4.3840E+03	7.5031E+00	0.000E+00	1.733E+00
7.648052E-01	3.51537E+01	1.2139E+01	3.9931E+03	7.8036E+00	0.000E+00	1.621E+00
8.175768E-01	3.53264E+01	1.1751E+01	3.6161E+03	8.0901E+00	0.000E+00	1.516E+00
8.739896E-01	3.52869E+01	1.1328E+01	3.2610E+03	8.3603E+00	0.000E+00	1.419E+00
9.342948E-01	3.49809E+01	1.0887E+01	2.9316E+03	8.6123E+00	0.000E+00	1.327E+00
9.987612E-01	3.43240E+01	1.0441E+01	2.6301E+03	8.8441E+00	0.000E+00	1.241E+00
1.067676E+00	3.37442E+01	9.6501E+00	2.2739E+03	9.0539E+00	0.000E+00	1.161E+00
1.141345E+00	3.16255E+01	8.9257E+00	1.9675E+03	9.2403E+00	0.000E+00	1.086E+00
1.220098E+00	2.75595E+01	8.2673E+00	1.7047E+03	9.4018E+00	0.000E+00	1.016E+00
1.304285E+00	1.84733E+01	7.6624E+00	1.4780E+03	9.5373E+00	0.000E+00	9.506E-01
1.381114E+00	-1.25575E+01	7.1738E+00	1.3068E+03	9.6322E+00	0.000E+00	8.977E-01
1.394281E+00	-3.29374E+01	7.0967E+00	1.2805E+03	9.6460E+00	0.000E+00	8.892E-01

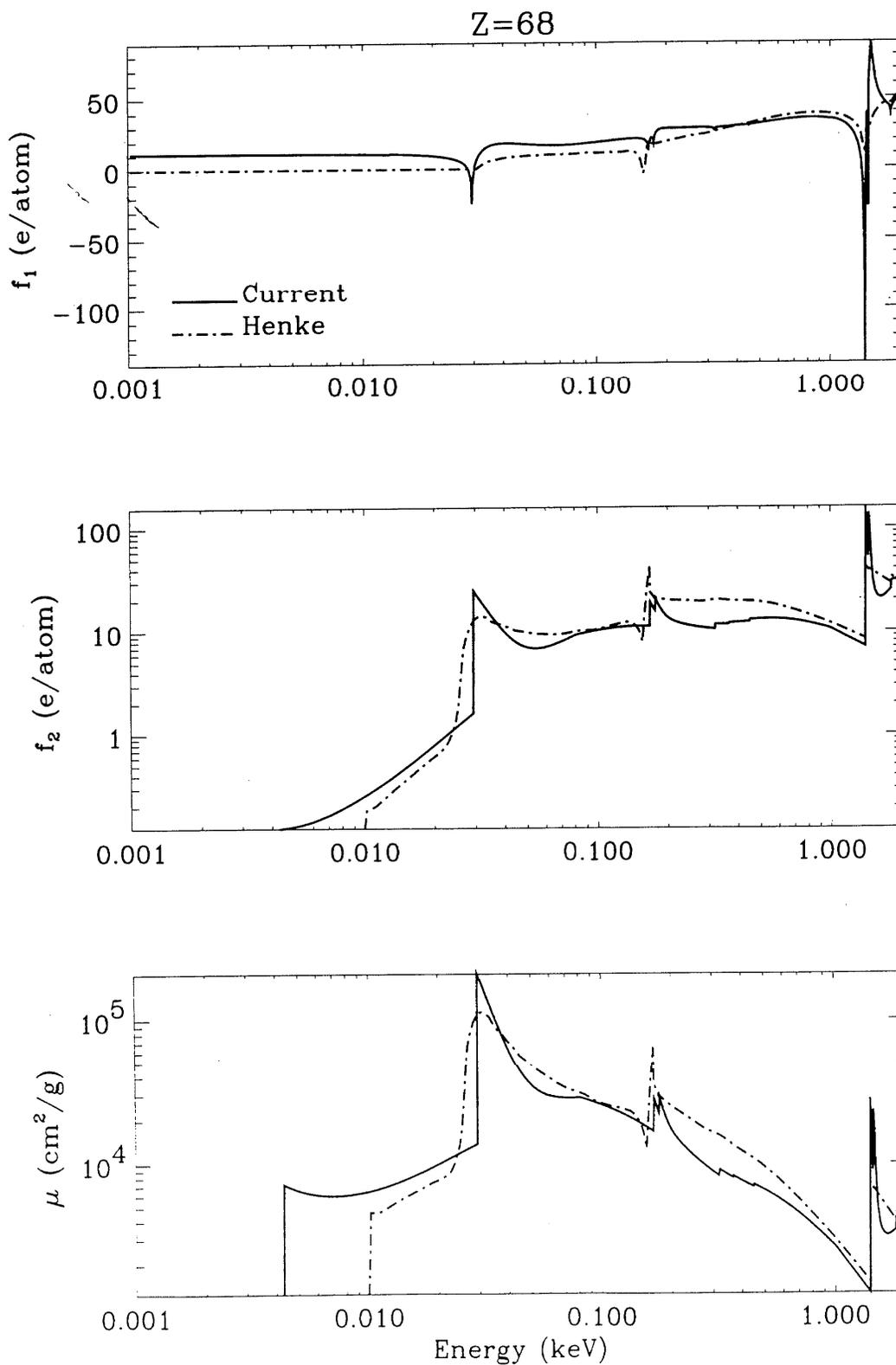
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 475

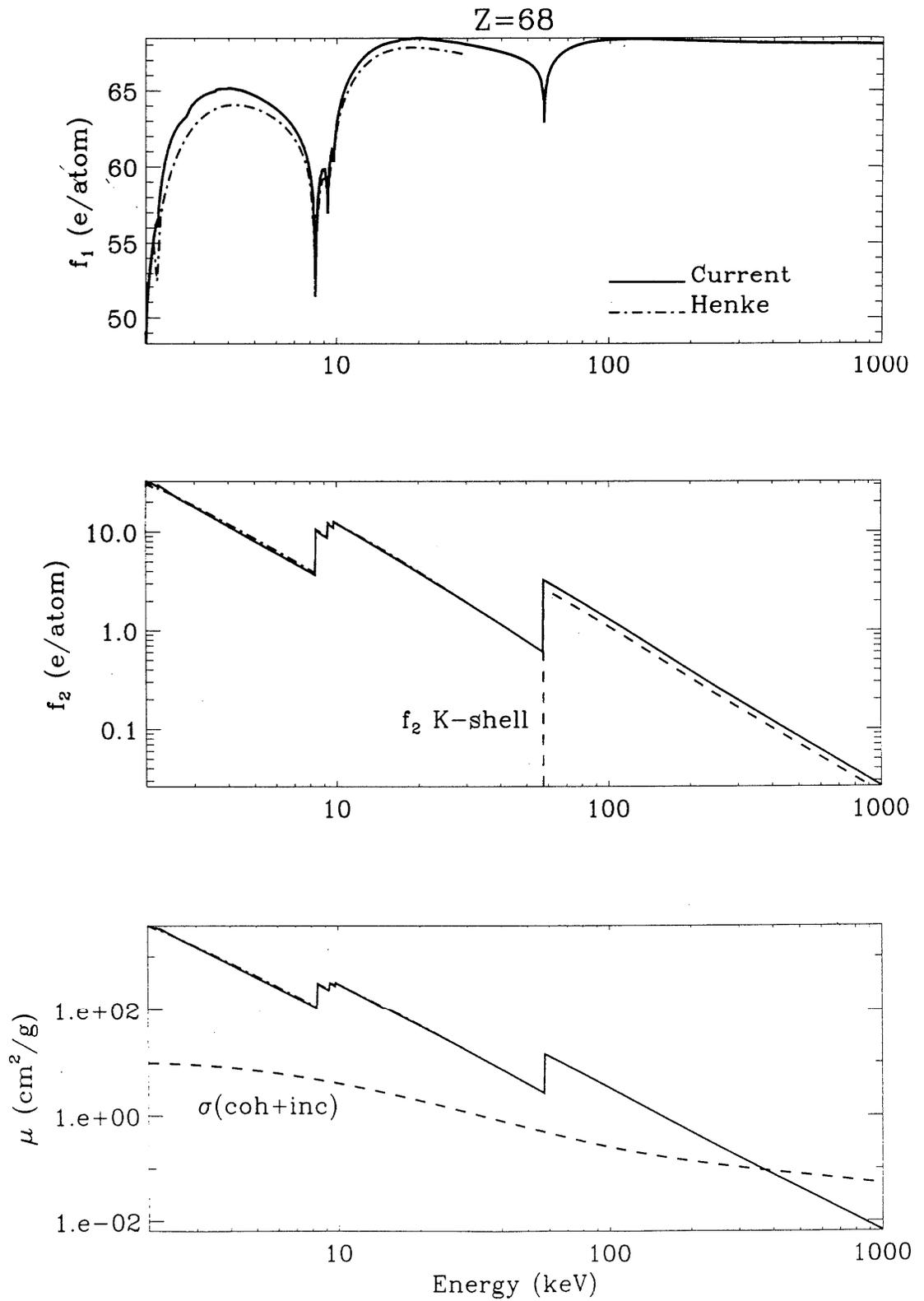
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.402253E+00	-6.19829E+01	7.0508E+00	1.2650E+03	9.6540E+00	0.000E+00	8.842E-01
1.407891E+00	-1.39014E+02	7.0187E+00	1.2542E+03	9.6595E+00	0.000E+00	8.806E-01
1.416346E+00	-1.54304E+01	1.5601E+02	2.7712E+04	9.6675E+00	0.000E+00	8.754E-01
1.424234E+00	2.65068E+01	1.2043E+02	2.1274E+04	9.6748E+00	0.000E+00	8.705E-01
1.437486E+00	3.83050E+01	7.8929E+01	1.3814E+04	9.6865E+00	0.000E+00	8.625E-01
1.446033E+00	2.27644E+01	6.0701E+01	1.0561E+04	9.6937E+00	0.000E+00	8.574E-01
1.451847E+00	-2.77694E+01	5.1046E+01	8.8455E+03	9.6985E+00	0.000E+00	8.540E-01
1.460566E+00	5.44733E+01	1.3900E+02	2.3943E+04	9.7054E+00	0.000E+00	8.489E-01
1.482366E+00	9.04688E+01	7.1419E+01	1.2121E+04	9.7215E+00	0.000E+00	8.364E-01
1.490486E+00	8.92286E+01	5.8190E+01	9.8222E+03	9.7270E+00	0.000E+00	8.318E-01
1.593329E+00	5.57680E+01	2.1144E+01	3.3386E+03	9.7801E+00	0.000E+00	7.781E-01
1.703269E+00	4.63958E+01	2.1374E+01	3.1571E+03	9.8051E+00	0.000E+00	7.279E-01
1.775564E+00	4.32944E+01	2.3416E+01	3.3179E+03	9.8065E+00	0.000E+00	6.983E-01
1.802741E+00	4.12860E+01	2.4317E+01	3.3936E+03	9.8042E+00	0.000E+00	6.878E-01
1.809988E+00	3.89456E+01	2.4560E+01	3.4139E+03	9.8034E+00	0.000E+00	6.850E-01
1.820795E+00	4.14993E+01	2.9627E+01	4.0937E+03	9.8020E+00	0.000E+00	6.809E-01
1.820859E+00	4.15113E+01	2.9629E+01	4.0938E+03	9.8020E+00	0.000E+00	6.809E-01
1.848036E+00	4.41904E+01	3.0134E+01	4.1023E+03	9.7975E+00	0.000E+00	6.709E-01
1.946430E+00	4.84820E+01	3.0707E+01	3.9691E+03	9.7712E+00	0.000E+00	6.370E-01
1.965684E+00	4.90777E+01	3.0661E+01	3.9243E+03	9.7643E+00	0.000E+00	6.307E-01
1.995771E+00	4.94434E+01	3.0481E+01	3.8424E+03	9.7526E+00	0.000E+00	6.212E-01
1.003794E+00	4.87780E+01	3.0415E+01	3.8188E+03	9.7492E+00	0.000E+00	6.187E-01
1.015829E+00	5.02092E+01	3.2204E+01	4.0193E+03	9.7441E+00	0.000E+00	6.151E-01
1.045916E+00	5.21452E+01	3.1782E+01	3.9082E+03	9.7304E+00	0.000E+00	6.060E-01
1.080733E+00	5.36424E+01	3.1193E+01	3.7716E+03	9.7132E+00	0.000E+00	5.959E-01
1.162370E+00	5.60414E+01	2.9582E+01	3.4418E+03	9.6676E+00	0.000E+00	5.734E-01
1.195468E+00	5.64296E+01	2.8871E+01	3.3084E+03	9.6473E+00	0.000E+00	5.647E-01
1.204294E+00	5.60492E+01	2.8678E+01	3.2731E+03	9.6417E+00	0.000E+00	5.625E-01
1.217533E+00	5.69689E+01	2.9564E+01	3.3541E+03	9.6332E+00	0.000E+00	5.591E-01
1.224304E+00	5.73074E+01	2.9411E+01	3.3266E+03	9.6288E+00	0.000E+00	5.574E-01
1.2250630E+00	5.82221E+01	2.8815E+01	3.2211E+03	9.6112E+00	0.000E+00	5.509E-01
1.2377781E+00	6.07361E+01	2.7543E+01	2.7543E+03	9.5189E+00	0.000E+00	5.214E-01
1.2541848E+00	6.22846E+01	2.2965E+01	2.2731E+03	9.3849E+00	0.000E+00	4.878E-01
1.2717235E+00	6.30584E+01	2.0511E+01	1.8991E+03	9.2279E+00	0.000E+00	4.563E-01
1.2904724E+00	6.37708E+01	1.8631E+01	1.6137E+03	9.0496E+00	0.000E+00	4.268E-01
1.3105150E+00	6.44628E+01	1.6902E+01	1.3694E+03	8.8516E+00	0.000E+00	3.993E-01
1.319406E+00	6.47770E+01	1.5233E+01	1.1545E+03	8.6355E+00	0.000E+00	3.735E-01
1.3548445E+00	6.49479E+01	1.3743E+01	9.7440E+02	8.4031E+00	0.000E+00	3.494E-01
1.3793288E+00	6.51269E+01	1.2388E+01	8.2163E+02	8.1565E+00	0.000E+00	3.269E-01
1.4055024E+00	6.51585E+01	1.1166E+01	6.9280E+02	7.8974E+00	0.000E+00	3.058E-01
1.434821E+00	6.50633E+01	1.0057E+01	5.8370E+02	7.6278E+00	0.000E+00	2.860E-01
1.4633924E+00	6.49252E+01	9.0625E+00	4.9202E+02	7.3495E+00	0.000E+00	2.676E-01
1.4953664E+00	6.47070E+01	8.1745E+00	4.1517E+02	7.0646E+00	0.000E+00	2.503E-01
1.5295467E+00	6.44383E+01	7.3833E+00	3.5078E+02	6.7747E+00	0.000E+00	2.341E-01
1.5660855E+00	6.41184E+01	6.6775E+00	2.9677E+02	6.4816E+00	0.000E+00	2.190E-01
1.6051453E+00	6.37384E+01	6.0465E+00	2.5138E+02	6.1871E+00	0.000E+00	2.049E-01
1.6469004E+00	6.32673E+01	5.4548E+00	2.1214E+02	5.8927E+00	0.000E+00	1.917E-01
1.6915365E+00	6.26355E+01	4.9195E+00	1.7898E+02	5.6000E+00	0.000E+00	1.793E-01
1.7392525E+00	6.17181E+01	4.4427E+00	1.5120E+02	5.3103E+00	0.000E+00	1.677E-01
1.7902609E+00	6.00372E+01	4.0175E+00	1.2790E+02	5.0248E+00	0.000E+00	1.569E-01
1.8190742E+00	5.78968E+01	3.8007E+00	1.1674E+02	4.8738E+00	0.000E+00	1.514E-01
1.8316110E+00	5.49282E+01	3.7129E+00	1.1233E+02	4.8102E+00	0.000E+00	1.491E-01
1.8349542E+00	5.14509E+01	3.6901E+00	1.1119E+02	4.7935E+00	0.000E+00	1.485E-01
1.8399689E+00	5.49359E+01	1.0444E+01	3.1282E+02	4.7685E+00	0.000E+00	1.476E-01
1.8447890E+00	5.66313E+01	1.0315E+01	3.0720E+02	4.7448E+00	0.000E+00	1.468E-01
1.8525058E+00	5.79659E+01	1.0115E+01	2.9850E+02	4.7071E+00	0.000E+00	1.454E-01
1.9030794E+00	5.98477E+01	9.0727E+00	2.5275E+02	4.4712E+00	0.000E+00	1.373E-01
1.9079014E+00	5.97452E+01	8.9917E+00	2.4917E+02	4.4497E+00	0.000E+00	1.366E-01
1.9217979E+00	5.86124E+01	8.7652E+00	2.3923E+02	4.3885E+00	0.000E+00	1.345E-01
1.9255036E+00	5.69490E+01	8.7063E+00	2.3667E+02	4.3724E+00	0.000E+00	1.340E-01
1.9310622E+00	5.88004E+01	1.2022E+01	3.2485E+02	4.3485E+00	0.000E+00	1.332E-01
1.9449586E+00	6.05211E+01	1.1691E+01	3.1127E+02	4.2895E+00	0.000E+00	1.312E-01
1.9556274E+00	6.10405E+01	1.1445E+01	3.0131E+02	4.2450E+00	0.000E+00	1.297E-01
1.9653919E+00	6.11845E+01	1.1224E+01	2.9251E+02	4.2049E+00	0.000E+00	1.284E-01
1.9702543E+00	6.10288E+01	1.1116E+01	2.8823E+02	4.1852E+00	0.000E+00	1.278E-01

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
9.741549E+00	6.03128E+01	1.1033E+01	2.8493E+02	4.1695E+00	0.000E+00	1.273E-01
9.800056E+00	6.13998E+01	1.2628E+01	3.2418E+02	4.1461E+00	0.000E+00	1.265E-01
9.946326E+00	6.26541E+01	1.2323E+01	3.1169E+02	4.0885E+00	0.000E+00	1.247E-01
1.032004E+01	6.41771E+01	1.1592E+01	2.8260E+02	3.9468E+00	0.000E+00	1.201E-01
1.03212E+01	6.56930E+01	1.0376E+01	2.3662E+02	3.6975E+00	0.000E+00	1.124E-01
1.179334E+01	6.66121E+01	9.3223E+00	1.9887E+02	3.4575E+00	0.000E+00	1.051E-01
1.260708E+01	6.72371E+01	8.3663E+00	1.6696E+02	3.2272E+00	0.000E+00	9.834E-02
1.347697E+01	6.76565E+01	7.4967E+00	1.3995E+02	3.0070E+00	0.000E+00	9.200E-02
1.440688E+01	6.79349E+01	6.7173E+00	1.1730E+02	2.7971E+00	0.000E+00	8.606E-02
1.540095E+01	6.81159E+01	6.0205E+00	9.8349E+01	2.5976E+00	0.000E+00	8.050E-02
1.646362E+01	6.82286E+01	5.3984E+00	8.2495E+01	2.4085E+00	0.000E+00	7.531E-02
1.759961E+01	6.83550E+01	4.8304E+00	6.9051E+01	2.2299E+00	0.000E+00	7.045E-02
1.881398E+01	6.84065E+01	4.3214E+00	5.7787E+01	2.0615E+00	0.000E+00	6.590E-02
2.011215E+01	6.84211E+01	3.8614E+00	4.8302E+01	1.9034E+00	0.000E+00	6.165E-02
2.149988E+01	6.83798E+01	3.4490E+00	4.0360E+01	1.7551E+00	0.000E+00	5.767E-02
2.298338E+01	6.83214E+01	3.0834E+00	3.3752E+01	1.6165E+00	0.000E+00	5.395E-02
2.456923E+01	6.82530E+01	2.7590E+00	2.8251E+01	1.4872E+00	0.000E+00	5.046E-02
2.626450E+01	6.81838E+01	2.4708E+00	2.3668E+01	1.3670E+00	0.000E+00	4.721E-02
2.807676E+01	6.81129E+01	2.1971E+00	1.9687E+01	1.2554E+00	0.000E+00	4.416E-02
3.001405E+01	6.80170E+01	1.9502E+00	1.6347E+01	1.1520E+00	0.000E+00	4.131E-02
3.208502E+01	6.79127E+01	1.7322E+00	1.3583E+01	1.0565E+00	0.000E+00	3.864E-02
3.429889E+01	6.78019E+01	1.5400E+00	1.1296E+01	9.6844E-01	0.000E+00	3.615E-02
3.666551E+01	6.76845E+01	1.3696E+00	9.3978E+00	8.8741E-01	0.000E+00	3.381E-02
3.919543E+01	6.75570E+01	1.2165E+00	7.8085E+00	8.1300E-01	0.000E+00	3.163E-02
4.189992E+01	6.74143E+01	1.0801E+00	6.4856E+00	7.4480E-01	0.000E+00	2.959E-02
4.479101E+01	6.72454E+01	9.5556E-01	5.3673E+00	6.8240E-01	0.000E+00	2.768E-02
4.788159E+01	6.70286E+01	8.4529E-01	4.4414E+00	6.2541E-01	0.000E+00	2.589E-02
5.118542E+01	6.67132E+01	7.4787E-01	3.6759E+00	5.7345E-01	0.000E+00	2.422E-02
5.471721E+01	6.60951E+01	6.6218E-01	3.0447E+00	5.2615E-01	0.000E+00	2.266E-02
5.633579E+01	6.54055E+01	6.2805E-01	2.8047E+00	5.0686E-01	0.000E+00	2.201E-02
5.719807E+01	6.42643E+01	6.1100E-01	2.6875E+00	4.9712E-01	0.000E+00	2.168E-02
5.742801E+01	6.28976E+01	6.0658E-01	2.6573E+00	4.9458E-01	0.000E+00	2.159E-02
5.777293E+01	6.42790E+01	3.2906E+00	1.4330E+01	4.9083E-01	1.172E+01	2.146E-02
5.849270E+01	6.54056E+01	3.2283E+00	1.3885E+01	4.8316E-01	1.136E+01	2.120E-02
5.863521E+01	6.55268E+01	3.2162E+00	1.3800E+01	4.8167E-01	1.129E+01	2.115E-02
6.252870E+01	6.69049E+01	2.9062E+00	1.1693E+01	4.4413E-01	9.600E+00	1.983E-02
6.684318E+01	6.74553E+01	2.6074E+00	9.8139E+00	4.0874E-01	8.076E+00	1.855E-02
7.145536E+01	6.77716E+01	2.3374E+00	8.2298E+00	3.7669E-01	6.786E+00	1.735E-02
7.638578E+01	6.79759E+01	2.0950E+00	6.9001E+00	3.4769E-01	5.700E+00	1.623E-02
8.165640E+01	6.81195E+01	1.8742E+00	5.7745E+00	3.2147E-01	4.779E+00	1.518E-02
8.729069E+01	6.82120E+01	1.6714E+00	4.8172E+00	2.9778E-01	3.996E+00	1.420E-02
9.331374E+01	6.82714E+01	1.4907E+00	4.0192E+00	2.7639E-01	3.341E+00	1.329E-02
9.975239E+01	6.83086E+01	1.3298E+00	3.3538E+00	2.5707E-01	2.794E+00	1.243E-02
1.066353E+02	6.83301E+01	1.1863E+00	2.7989E+00	2.3963E-01	2.336E+00	1.163E-02
1.139931E+02	6.83409E+01	1.0585E+00	2.3362E+00	2.2387E-01	1.953E+00	1.088E-02
1.218587E+02	6.83712E+01	9.4103E-01	1.9428E+00	2.0963E-01	1.626E+00	1.017E-02
1.302669E+02	6.83646E+01	8.3621E-01	1.6150E+00	1.9675E-01	1.352E+00	9.518E-03
1.392553E+02	6.83529E+01	7.4314E-01	1.3426E+00	1.8509E-01	1.125E+00	8.903E-03
1.488640E+02	6.83380E+01	6.6049E-01	1.1163E+00	1.7452E-01	9.359E-01	8.329E-03
1.591356E+02	6.83210E+01	5.8709E-01	9.2817E-01	1.6491E-01	7.786E-01	7.791E-03
1.701159E+02	6.83027E+01	5.2189E-01	7.7183E-01	1.5617E-01	6.477E-01	7.288E-03
1.818539E+02	6.82839E+01	4.6397E-01	6.4189E-01	1.4819E-01	5.388E-01	6.818E-03
1.944018E+02	6.82650E+01	4.1252E-01	5.3386E-01	1.4089E-01	4.482E-01	6.378E-03
2.078156E+02	6.82463E+01	3.6680E-01	4.4405E-01	1.3418E-01	3.728E-01	5.966E-03
2.221548E+02	6.82279E+01	3.2617E-01	3.6938E-01	1.2801E-01	3.102E-01	5.581E-03
2.374835E+02	6.82101E+01	2.9007E-01	3.0729E-01	1.2230E-01	2.580E-01	5.221E-03
2.538699E+02	6.81928E+01	2.5839E-01	2.5607E-01	1.1701E-01	2.150E-01	4.884E-03
2.713869E+02	6.81769E+01	2.3113E-01	2.1427E-01	1.1208E-01	1.801E-01	4.569E-03
2.901126E+02	6.81622E+01	2.0676E-01	1.7930E-01	1.0747E-01	1.508E-01	4.274E-03
3.101304E+02	6.81487E+01	1.8498E-01	1.5006E-01	1.0314E-01	1.263E-01	3.998E-03
3.315294E+02	6.81363E+01	1.6550E-01	1.2559E-01	9.9054E-02	1.058E-01	3.740E-03
3.544049E+02	6.81247E+01	1.4808E-01	1.0512E-01	9.5192E-02	8.861E-02	3.498E-03
3.788588E+02	6.81141E+01	1.3250E-01	8.7988E-02	9.1523E-02	7.421E-02	3.273E-03
4.050001E+02	6.81042E+01	1.1857E-01	7.3654E-02	8.8026E-02	6.215E-02	3.061E-03
4.329451E+02	6.80951E+01	1.0611E-01	6.1659E-02	8.4682E-02	5.205E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 479

τ_m Z = 69

atomic weight = 1.689342E+02 g/mol, nominal density ρ (g/cm³) = 9.2940E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.80522E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.49093E+05

edges. Edge energies (keV):

K		5.93896E+00	L	I	1.01157E+00	L	II	9.61690E+00	L	III	8.64800E+00
M	I	2.30680E+00	M	II	2.08980E+00	M	III	1.88450E+00	M	IV	1.51460E+00
M	V	1.46720E+00	N	I	4.71700E-00	N	II	3.85900E-00	N	III	3.36600E-01
N	IV	1.79600E-00	N	V	1.79600E-00	O	I	5.30000E-03	O	II	5.30000E-03
O	III	5.32000E-02	N	VI	3.23000E-02	N	VII	3.23000E-02			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.2098E+00, -7.2240E-01 e/atom

Nuclear Thomson correction f_{NT} = 1.5460E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
5.194000E-03	1.05318E+01	0.0000E+00	0.0000E+00	7.0183E-06	0.000E+00	2.387E+02
5.273500E-03	1.04639E+01	0.0000E+00	0.0000E+00	7.6206E-06	0.000E+00	2.351E+02
5.294700E-03	1.03894E+01	0.0000E+00	0.0000E+00	7.7877E-06	0.000E+00	2.342E+02
5.326500E-03	1.04604E+01	1.4292E-01	6.6835E+03	8.0437E-06	0.000E+00	2.328E+02
5.406000E-03	1.05184E+01	1.4344E-01	6.6095E+03	8.7123E-06	0.000E+00	2.293E+02
1.069000E-02	1.02397E+01	2.5905E-01	6.0363E+03	2.5863E-04	0.000E+00	1.160E+02
1.142761E-02	1.01620E+01	2.8489E-01	6.2100E+03	3.5003E-04	0.000E+00	1.085E+02
1.221612E-02	1.00721E+01	3.1469E-01	6.4167E+03	4.7131E-04	0.000E+00	1.015E+02
1.305903E-02	9.96790E+00	3.4900E-01	6.6570E+03	6.3143E-04	0.000E+00	9.494E+01
1.396010E-02	9.84691E+00	3.8849E-01	6.9319E+03	8.4168E-04	0.000E+00	8.881E+01
1.492335E-02	9.70585E+00	4.3390E-01	7.2425E+03	1.1164E-03	0.000E+00	8.308E+01
1.595306E-02	1.02087E+01	4.8611E-01	7.5902E+03	1.4733E-03	0.000E+00	7.772E+01
1.705382E-02	1.00135E+01	5.4609E-01	7.9763E+03	1.9349E-03	0.000E+00	7.270E+01
1.823053E-02	9.78076E+00	6.1496E-01	8.4026E+03	2.5285E-03	0.000E+00	6.801E+01
1.948844E-02	9.49946E+00	6.9400E-01	8.8704E+03	3.2882E-03	0.000E+00	6.362E+01
2.083314E-02	9.15334E+00	7.8460E-01	9.3811E+03	4.2554E-03	0.000E+00	5.951E+01
2.227063E-02	8.71683E+00	8.8828E-01	9.9352E+03	5.4806E-03	0.000E+00	5.567E+01
2.380730E-02	8.14646E+00	1.0065E+00	1.0531E+04	7.0249E-03	0.000E+00	5.208E+01
2.545001E-02	7.36100E+00	1.1409E+00	1.1167E+04	8.9614E-03	0.000E+00	4.872E+01
2.720606E-02	6.18552E+00	1.2935E+00	1.1843E+04	1.1378E-02	0.000E+00	4.557E+01
2.908327E-02	4.13989E+00	1.4661E+00	1.2557E+04	1.4378E-02	0.000E+00	4.263E+01
3.109002E-02	-1.07371E+00	1.6608E+00	1.3306E+04	1.8084E-02	0.000E+00	3.988E+01
3.165400E-02	-4.94686E+00	1.7174E+00	1.3514E+04	1.9221E-02	0.000E+00	3.917E+01
3.213850E-02	-1.44758E+01	1.7665E+00	1.3692E+04	2.0233E-02	0.000E+00	3.858E+01
3.226770E-02	-2.64192E+01	1.7797E+00	1.3739E+04	2.0508E-02	0.000E+00	3.842E+01
3.246150E-02	1.32016E+01	2.5575E+01	1.9625E+05	2.0925E-02	0.000E+00	3.819E+01
3.294600E-02	-1.50865E+00	2.4276E+01	1.8354E+05	2.1989E-02	0.000E+00	3.763E+01
3.323523E-02	1.71508E+00	2.3547E+01	1.7648E+05	2.2640E-02	0.000E+00	3.731E+01
3.552846E-02	1.20535E+01	1.8798E+01	1.3180E+05	2.8214E-02	0.000E+00	3.490E+01
3.797993E-02	1.56441E+01	1.5152E+01	9.9372E+04	3.4998E-02	0.000E+00	3.264E+01
4.060054E-02	1.70816E+01	1.2365E+01	7.5863E+04	4.3217E-02	0.000E+00	3.054E+01
4.340198E-02	1.75084E+01	1.0336E+01	5.9323E+04	5.3124E-02	0.000E+00	2.857E+01
4.639671E-02	1.74405E+01	8.9323E+00	4.7956E+04	6.5010E-02	0.000E+00	2.672E+01
4.959809E-02	1.71456E+01	8.0236E+00	4.0296E+04	7.9199E-02	0.000E+00	2.500E+01
5.213600E-02	1.68602E+01	7.6007E+00	3.6314E+04	9.1535E-02	0.000E+00	2.378E+01
5.293400E-02	1.67592E+01	7.5087E+00	3.5334E+04	9.5611E-02	0.000E+00	2.342E+01
5.302035E-02	1.67457E+01	7.4997E+00	3.5234E+04	9.6058E-02	0.000E+00	2.338E+01
5.314680E-02	1.67187E+01	7.4870E+00	3.5091E+04	9.6714E-02	0.000E+00	2.333E+01
5.346600E-02	1.67026E+01	7.4917E+00	3.4903E+04	9.8381E-02	0.000E+00	2.319E+01
5.426400E-02	1.66351E+01	7.4271E+00	3.4093E+04	1.0261E-01	0.000E+00	2.285E+01
5.667876E-02	1.64141E+01	7.3118E+00	3.2134E+04	1.1599E-01	0.000E+00	2.187E+01
6.058959E-02	1.61064E+01	7.3198E+00	3.0093E+04	1.3945E-01	0.000E+00	2.046E+01
6.477028E-02	1.58667E+01	7.5089E+00	2.8878E+04	1.6693E-01	0.000E+00	1.914E+01
6.923942E-02	1.57111E+01	7.8428E+00	2.8215E+04	1.9896E-01	0.000E+00	1.791E+01
7.401695E-02	1.56505E+01	8.2953E+00	2.7917E+04	2.3611E-01	0.000E+00	1.675E+01
7.912411E-02	1.56952E+01	8.8472E+00	2.7852E+04	2.7902E-01	0.000E+00	1.567E+01
8.458368E-02	1.58582E+01	9.4845E+00	2.7931E+04	3.2832E-01	0.000E+00	1.466E+01
9.041995E-02	1.61588E+01	1.0197E+01	2.8090E+04	3.8472E-01	0.000E+00	1.371E+01
9.665893E-02	1.66281E+01	1.0976E+01	2.8286E+04	4.4893E-01	0.000E+00	1.283E+01
1.033284E-01	1.72880E+01	1.1536E+01	2.7810E+04	5.2169E-01	0.000E+00	1.200E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.104581E-01	1.79606E+01	1.1865E+01	2.6757E+04	6.0374E-01	0.000E+00	1.122E+01
1.180797E-01	1.86251E+01	1.2156E+01	2.5643E+04	6.9586E-01	0.000E+00	1.050E+01
1.262272E-01	1.92749E+01	1.2401E+01	2.4473E+04	7.9878E-01	0.000E+00	9.822E+00
1.349368E-01	1.98893E+01	1.2596E+01	2.3252E+04	9.1324E-01	0.000E+00	9.188E+00
1.442475E-01	2.04265E+01	1.2735E+01	2.1992E+04	1.0399E+00	0.000E+00	8.595E+00
1.542005E-01	2.07932E+01	1.2816E+01	2.0703E+04	1.1795E+00	0.000E+00	8.040E+00
1.648404E-01	2.07040E+01	1.2837E+01	1.9399E+04	1.3326E+00	0.000E+00	7.521E+00
1.760080E-01	1.81419E+01	1.2800E+01	1.8114E+04	1.4966E+00	0.000E+00	7.044E+00
1.762144E-01	1.79860E+01	1.2798E+01	1.8091E+04	1.4996E+00	0.000E+00	7.036E+00
1.787020E-01	1.38671E+01	1.2783E+01	1.7818E+04	1.5365E+00	0.000E+00	6.938E+00
1.794204E-01	7.91356E+00	1.2778E+01	1.7739E+04	1.5472E+00	0.000E+00	6.910E+00
1.804980E-01	1.53960E+01	2.4864E+01	3.4313E+04	1.5633E+00	0.000E+00	6.869E+00
1.831920E-01	2.19297E+01	2.3069E+01	3.1368E+04	1.6034E+00	0.000E+00	6.768E+00
1.883732E-01	2.58524E+01	2.0357E+01	2.6919E+04	1.6811E+00	0.000E+00	6.582E+00
2.013709E-01	2.81413E+01	1.6331E+01	2.0202E+04	1.8772E+00	0.000E+00	6.157E+00
2.152655E-01	2.84391E+01	1.4582E+01	1.6873E+04	2.0883E+00	0.000E+00	5.760E+00
2.301188E-01	2.86454E+01	1.3707E+01	1.4837E+04	2.3143E+00	0.000E+00	5.388E+00
2.459970E-01	2.88906E+01	1.3153E+01	1.3319E+04	2.5551E+00	0.000E+00	5.040E+00
2.629708E-01	2.91443E+01	1.2741E+01	1.2068E+04	2.8105E+00	0.000E+00	4.715E+00
2.811158E-01	2.93664E+01	1.2406E+01	1.0993E+04	3.0799E+00	0.000E+00	4.410E+00
3.005128E-01	2.95102E+01	1.2127E+01	1.0052E+04	3.3629E+00	0.000E+00	4.126E+00
3.212482E-01	2.94567E+01	1.1900E+01	9.2270E+03	3.6584E+00	0.000E+00	3.859E+00
3.298680E-01	2.92360E+01	1.1824E+01	8.9284E+03	3.7790E+00	0.000E+00	3.759E+00
3.349170E-01	2.87537E+01	1.1784E+01	8.7640E+03	3.8490E+00	0.000E+00	3.702E+00
3.362634E-01	2.81490E+01	1.1773E+01	8.7214E+03	3.8676E+00	0.000E+00	3.687E+00
3.382830E-01	2.87792E+01	1.2964E+01	9.5458E+03	3.8953E+00	0.000E+00	3.665E+00
3.434143E-01	2.93578E+01	1.2941E+01	9.3869E+03	3.9656E+00	0.000E+00	3.610E+00
3.671099E-01	3.01153E+01	1.2875E+01	8.7357E+03	4.2832E+00	0.000E+00	3.377E+00
3.781820E-01	3.02655E+01	1.2861E+01	8.4708E+03	4.4277E+00	0.000E+00	3.278E+00
3.839705E-01	3.02339E+01	1.2857E+01	8.3406E+03	4.5021E+00	0.000E+00	3.229E+00
3.855141E-01	3.00940E+01	1.2856E+01	8.3068E+03	4.5219E+00	0.000E+00	3.216E+00
3.878295E-01	3.03043E+01	1.3186E+01	8.4689E+03	4.5514E+00	0.000E+00	3.197E+00
3.924405E-01	3.05154E+01	1.3189E+01	8.3715E+03	4.6099E+00	0.000E+00	3.159E+00
3.936180E-01	3.05537E+01	1.3190E+01	8.3472E+03	4.6247E+00	0.000E+00	3.150E+00
4.195189E-01	3.11406E+01	1.3227E+01	7.8537E+03	4.9439E+00	0.000E+00	2.955E+00
4.484657E-01	3.16088E+01	1.3284E+01	7.3786E+03	5.2837E+00	0.000E+00	2.765E+00
4.622660E-01	3.17332E+01	1.3311E+01	7.1729E+03	5.4395E+00	0.000E+00	2.682E+00
4.693415E-01	3.16421E+01	1.3324E+01	7.0717E+03	5.5178E+00	0.000E+00	2.642E+00
4.712283E-01	3.14135E+01	1.3328E+01	7.0451E+03	5.5385E+00	0.000E+00	2.631E+00
4.740585E-01	3.17315E+01	1.3850E+01	7.2774E+03	5.5694E+00	0.000E+00	2.615E+00
4.794098E-01	3.20284E+01	1.3861E+01	7.2020E+03	5.6274E+00	0.000E+00	2.586E+00
4.811340E-01	3.20946E+01	1.3865E+01	7.1780E+03	5.6459E+00	0.000E+00	2.577E+00
5.124891E-01	3.29320E+01	1.3912E+01	6.7621E+03	5.9728E+00	0.000E+00	2.419E+00
5.478508E-01	3.37277E+01	1.3922E+01	6.3299E+03	6.3178E+00	0.000E+00	2.263E+00
5.856525E-01	3.44598E+01	1.3870E+01	5.8995E+03	6.6603E+00	0.000E+00	2.117E+00
6.260625E-01	3.51619E+01	1.3748E+01	5.4700E+03	6.9978E+00	0.000E+00	1.980E+00
6.692609E-01	3.58161E+01	1.3551E+01	5.0435E+03	7.3281E+00	0.000E+00	1.853E+00
7.154399E-01	3.64009E+01	1.3282E+01	4.6242E+03	7.6489E+00	0.000E+00	1.733E+00
7.648052E-01	3.68922E+01	1.2940E+01	4.2146E+03	7.9576E+00	0.000E+00	1.621E+00
8.175768E-01	3.72585E+01	1.2535E+01	3.8189E+03	8.2522E+00	0.000E+00	1.510E+00
8.739896E-01	3.74712E+01	1.2084E+01	3.4441E+03	8.5304E+00	0.000E+00	1.419E+00
9.342948E-01	3.75174E+01	1.1612E+01	3.0958E+03	8.7900E+00	0.000E+00	1.327E+00
9.987612E-01	3.74182E+01	1.1134E+01	2.7768E+03	9.0292E+00	0.000E+00	1.241E+00
1.067676E+00	3.65298E+01	1.0265E+01	2.3949E+03	9.2461E+00	0.000E+00	1.161E+00
1.141345E+00	3.48674E+01	9.4741E+00	2.0677E+03	9.4390E+00	0.000E+00	1.086E+00
1.220098E+00	3.20183E+01	8.7592E+00	1.7883E+03	9.6067E+00	0.000E+00	1.016E+00
1.304285E+00	2.66579E+01	8.1120E+00	1.5492E+03	9.7479E+00	0.000E+00	9.506E-01
1.394281E+00	1.26076E+01	7.5136E+00	1.3423E+03	9.8617E+00	0.000E+00	8.892E-01
1.438346E+00	-1.02228E+01	7.2492E+00	1.2554E+03	9.9051E+00	0.000E+00	8.620E-01
1.460362E+00	-5.88191E+01	7.1245E+00	1.2152E+03	9.9241E+00	0.000E+00	8.490E-01
1.466232E+00	-1.34679E+02	7.0920E+00	1.2048E+03	9.9288E+00	0.000E+00	8.456E-01
1.475039E+00	-1.28765E+01	1.5402E+02	2.6010E+04	9.9358E+00	0.000E+00	8.405E-01
1.484308E+00	3.14543E+01	1.1528E+02	1.9347E+04	9.9428E+00	0.000E+00	8.353E-01
1.490486E+00	4.06899E+01	9.5396E+01	1.5943E+04	9.9473E+00	0.000E+00	8.318E-01
1.497054E+00	4.15512E+01	7.8295E+01	1.3027E+04	9.9519E+00	0.000E+00	8.282E-01

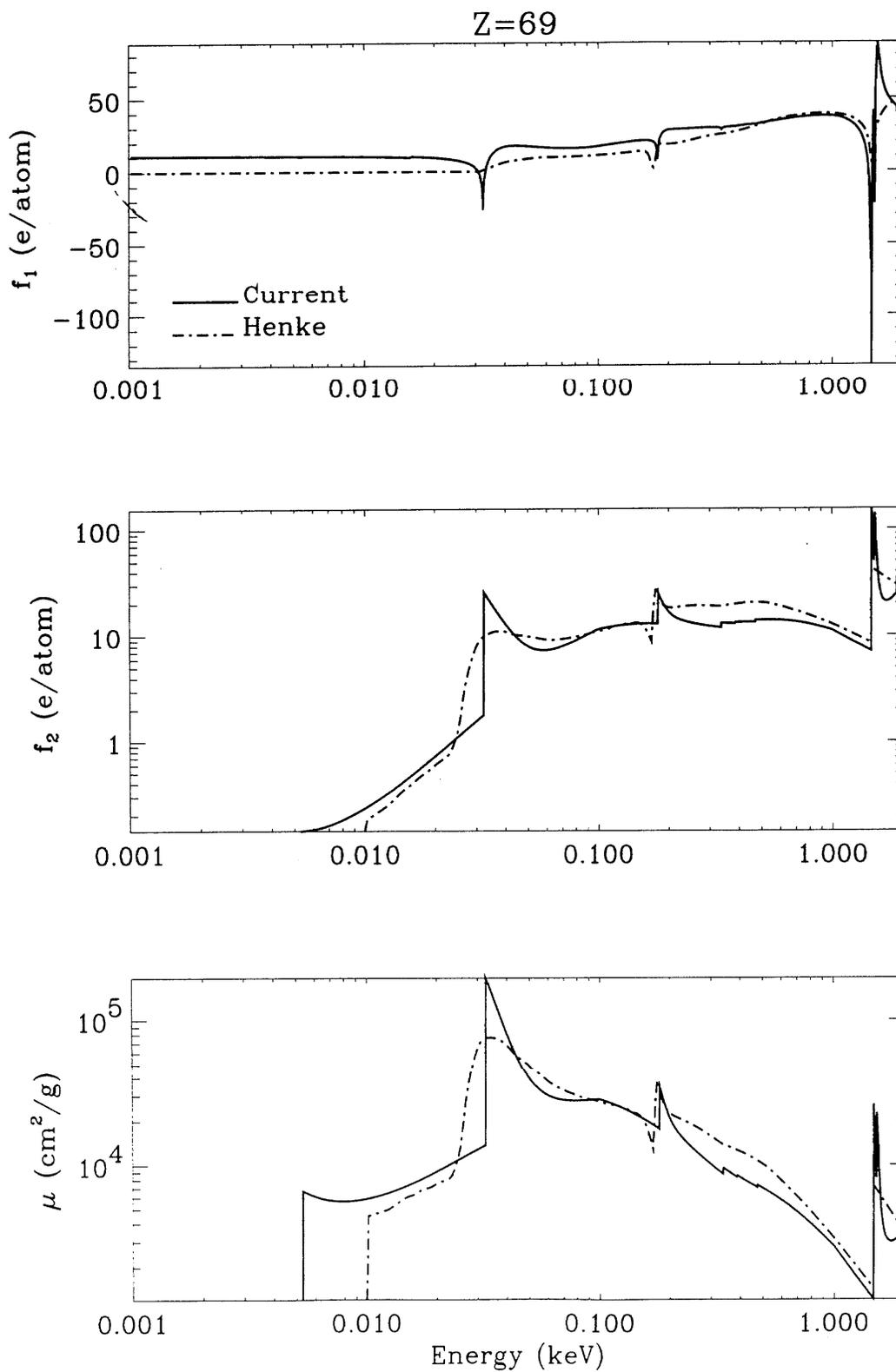
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 481

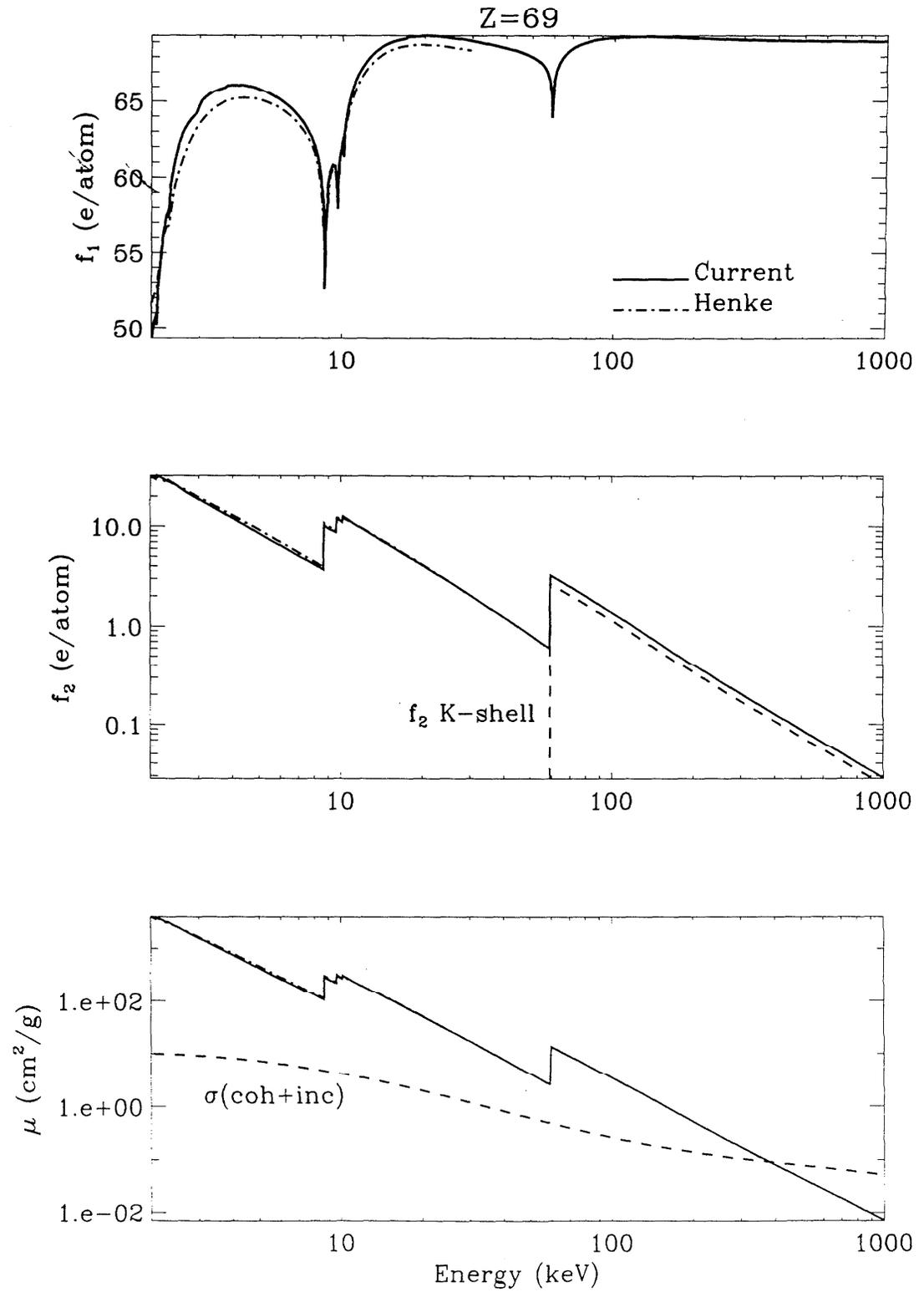
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.507027E+00	2.56654E+01	5.8504E+01	9.6700E+03	9.9587E+00	0.000E+00	8.227E-01
1.513085E+00	-2.26801E+01	4.9299E+01	8.1158E+03	9.9626E+00	0.000E+00	8.194E-01
1.522173E+00	5.49876E+01	1.3321E+02	2.1799E+04	9.9683E+00	0.000E+00	8.145E-01
1.544892E+00	8.93163E+01	6.9684E+01	1.1236E+04	9.9815E+00	0.000E+00	8.025E-01
1.593329E+00	7.20489E+01	2.7671E+01	4.3259E+03	1.0004E+01	0.000E+00	7.781E-01
1.703269E+00	5.20329E+01	2.0680E+01	3.0243E+03	1.0032E+01	0.000E+00	7.279E-01
1.820795E+00	4.55621E+01	2.2628E+01	3.0956E+03	1.0032E+01	0.000E+00	6.809E-01
1.846810E+00	4.45465E+01	2.3394E+01	3.1553E+03	1.0028E+01	0.000E+00	6.713E-01
1.875078E+00	4.25493E+01	2.4276E+01	3.2249E+03	1.0023E+01	0.000E+00	6.612E-01
1.882616E+00	4.02264E+01	2.4515E+01	3.2436E+03	1.0021E+01	0.000E+00	6.586E-01
1.893923E+00	4.27592E+01	2.9540E+01	3.8852E+03	1.0018E+01	0.000E+00	6.546E-01
1.922190E+00	4.54322E+01	3.0083E+01	3.8984E+03	1.0011E+01	0.000E+00	6.450E-01
1.946430E+00	4.67231E+01	3.0376E+01	3.8874E+03	1.0003E+01	0.000E+00	6.370E-01
2.048004E+00	5.04877E+01	3.0507E+01	3.7105E+03	9.9622E+00	0.000E+00	6.054E-01
2.080733E+00	5.08155E+01	3.0271E+01	3.6239E+03	9.9462E+00	0.000E+00	5.959E-01
2.087710E+00	5.01899E+01	3.0207E+01	3.6041E+03	9.9426E+00	0.000E+00	5.939E-01
2.100249E+00	5.15997E+01	3.1960E+01	3.7905E+03	9.9360E+00	0.000E+00	5.903E-01
2.131596E+00	5.35016E+01	3.1508E+01	3.6819E+03	9.9189E+00	0.000E+00	5.816E-01
2.224304E+00	5.66580E+01	2.9817E+01	3.3391E+03	9.8623E+00	0.000E+00	5.574E-01
2.260664E+00	5.74558E+01	2.9082E+01	3.2044E+03	9.8379E+00	0.000E+00	5.484E-01
2.295266E+00	5.77831E+01	2.8358E+01	3.0776E+03	9.8137E+00	0.000E+00	5.402E-01
2.304493E+00	5.73876E+01	2.8163E+01	3.0442E+03	9.8070E+00	0.000E+00	5.380E-01
2.318334E+00	5.82830E+01	2.9046E+01	3.1209E+03	9.7970E+00	0.000E+00	5.348E-01
2.352936E+00	5.94792E+01	2.8299E+01	2.9958E+03	9.7712E+00	0.000E+00	5.269E-01
2.377781E+00	6.00671E+01	2.7767E+01	2.9089E+03	9.7522E+00	0.000E+00	5.214E-01
2.541848E+00	6.24067E+01	2.4523E+01	2.4032E+03	9.6173E+00	0.000E+00	4.878E-01
2.717235E+00	6.35356E+01	2.1808E+01	1.9991E+03	9.4588E+00	0.000E+00	4.563E-01
2.904724E+00	6.41787E+01	1.9696E+01	1.6890E+03	9.2783E+00	0.000E+00	4.268E-01
3.105150E+00	6.51868E+01	1.7868E+01	1.4334E+03	9.0774E+00	0.000E+00	3.993E-01
3.319406E+00	6.55976E+01	1.6109E+01	1.2088E+03	8.8579E+00	0.000E+00	3.735E-01
3.548445E+00	6.58397E+01	1.4530E+01	1.0200E+03	8.6216E+00	0.000E+00	3.494E-01
3.793288E+00	6.60749E+01	1.3122E+01	8.6165E+02	8.3705E+00	0.000E+00	3.269E-01
4.055024E+00	6.61088E+01	1.1825E+01	7.2639E+02	8.1065E+00	0.000E+00	3.058E-01
4.334821E+00	6.61107E+01	1.0658E+01	6.1242E+02	7.8315E+00	0.000E+00	2.860E-01
4.633924E+00	6.60094E+01	9.6063E+00	5.1638E+02	7.5475E+00	0.000E+00	2.676E-01
4.953664E+00	6.58258E+01	8.6601E+00	4.3547E+02	7.2564E+00	0.000E+00	2.503E-01
5.295467E+00	6.55870E+01	7.8175E+00	3.6773E+02	6.9601E+00	0.000E+00	2.341E-01
5.660855E+00	6.52974E+01	7.0662E+00	3.1093E+02	6.6604E+00	0.000E+00	2.190E-01
6.051453E+00	6.49529E+01	6.3955E+00	2.6325E+02	6.3591E+00	0.000E+00	2.049E-01
6.469004E+00	6.45390E+01	5.7885E+00	2.2289E+02	6.0578E+00	0.000E+00	1.917E-01
6.915365E+00	6.40048E+01	5.2191E+00	1.8799E+02	5.7580E+00	0.000E+00	1.793E-01
7.392525E+00	6.32653E+01	4.7110E+00	1.5874E+02	5.4611E+00	0.000E+00	1.677E-01
7.902609E+00	6.21040E+01	4.2584E+00	1.3423E+02	5.1685E+00	0.000E+00	1.569E-01
8.447890E+00	5.92839E+01	3.8477E+00	1.1345E+02	4.8814E+00	0.000E+00	1.468E-01
8.475040E+00	5.89756E+01	3.8287E+00	1.1253E+02	4.8677E+00	0.000E+00	1.463E-01
8.604760E+00	5.60429E+01	3.7405E+00	1.0828E+02	4.8033E+00	0.000E+00	1.441E-01
8.639352E+00	5.25930E+01	3.7176E+00	1.0719E+02	4.7863E+00	0.000E+00	1.435E-01
8.691240E+00	5.60824E+01	1.0419E+01	2.9860E+02	4.7611E+00	0.000E+00	1.427E-01
8.820960E+00	5.90778E+01	9.9983E+00	2.8234E+02	4.6988E+00	0.000E+00	1.406E-01
9.030794E+00	5.03859E+01	9.5496E+00	2.6340E+02	4.6007E+00	0.000E+00	1.373E-01
9.424561E+00	6.07158E+01	9.0035E+00	2.3796E+02	4.4251E+00	0.000E+00	1.316E-01
9.568814E+00	5.95927E+01	8.8174E+00	2.2953E+02	4.3633E+00	0.000E+00	1.296E-01
9.607282E+00	5.79397E+01	8.7676E+00	2.2732E+02	4.3471E+00	0.000E+00	1.291E-01
9.653919E+00	5.94809E+01	1.2105E+01	3.1235E+02	4.3275E+00	0.000E+00	1.284E-01
9.664983E+00	5.97910E+01	1.2082E+01	3.1138E+02	4.3229E+00	0.000E+00	1.283E-01
9.809237E+00	6.15257E+01	1.1774E+01	2.9899E+02	4.2633E+00	0.000E+00	1.264E-01
9.913386E+00	6.20369E+01	1.1552E+01	2.9027E+02	4.2212E+00	0.000E+00	1.251E-01
1.006512E+01	6.20671E+01	1.1228E+01	2.7786E+02	4.1608E+00	0.000E+00	1.232E-01
1.010558E+01	6.13640E+01	1.1143E+01	2.7466E+02	4.1450E+00	0.000E+00	1.227E-01
1.016628E+01	6.24607E+01	1.2729E+01	3.1189E+02	4.1214E+00	0.000E+00	1.220E-01
1.032004E+01	6.37534E+01	1.2408E+01	2.9949E+02	4.0625E+00	0.000E+00	1.201E-01
1.103212E+01	6.61062E+01	1.0996E+01	2.4828E+02	3.8065E+00	0.000E+00	1.124E-01
1.179334E+01	6.72118E+01	9.8298E+00	2.0762E+02	3.5599E+00	0.000E+00	1.051E-01
1.260708E+01	6.79569E+01	8.8364E+00	1.7459E+02	3.3233E+00	0.000E+00	9.834E-02
1.347697E+01	6.84675E+01	7.9243E+00	1.4646E+02	3.0969E+00	0.000E+00	9.200E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.440688E+01	6.88093E+01	7.1023E+00	1.2280E+02	2.8811E+00	0.000E+00	8.606E-02
1.540095E+01	6.90350E+01	6.3661E+00	1.0296E+02	2.6759E+00	0.000E+00	8.050E-02
1.646362E+01	6.91791E+01	5.7080E+00	8.6362E+01	2.4814E+00	0.000E+00	7.531E-02
1.759961E+01	6.93315E+01	5.1161E+00	7.2410E+01	2.2975E+00	0.000E+00	7.045E-02
1.881398E+01	6.93678E+01	4.5777E+00	6.0607E+01	2.1242E+00	0.000E+00	6.590E-02
2.011215E+01	6.94030E+01	4.0962E+00	5.0732E+01	1.9614E+00	0.000E+00	6.165E-02
2.149988E+01	6.94058E+01	3.6598E+00	4.2402E+01	1.8087E+00	0.000E+00	5.767E-02
2.298338E+01	6.93572E+01	3.2721E+00	3.5463E+01	1.6659E+00	0.000E+00	5.395E-02
2.456923E+01	6.92964E+01	2.9280E+00	2.9686E+01	1.5327E+00	0.000E+00	5.046E-02
2.626450E+01	6.92330E+01	2.6224E+00	2.4871E+01	1.4087E+00	0.000E+00	4.721E-02
2.807676E+01	6.91640E+01	2.3318E+00	2.0687E+01	1.2936E+00	0.000E+00	4.416E-02
3.001405E+01	6.90712E+01	2.0697E+00	1.7177E+01	1.1870E+00	0.000E+00	4.131E-02
3.208502E+01	6.89695E+01	1.8385E+00	1.4273E+01	1.0885E+00	0.000E+00	3.864E-02
3.429889E+01	6.88613E+01	1.6344E+00	1.1869E+01	9.9767E-01	0.000E+00	3.615E-02
3.666551E+01	6.87471E+01	1.4542E+00	9.8791E+00	9.1405E-01	0.000E+00	3.381E-02
3.919543E+01	6.86254E+01	1.2928E+00	8.2156E+00	8.3725E-01	0.000E+00	3.163E-02
4.189992E+01	6.84912E+01	1.1489E+00	6.8299E+00	7.6684E-01	0.000E+00	2.959E-02
4.479101E+01	6.83377E+01	1.0190E+00	5.6671E+00	7.0241E-01	0.000E+00	2.768E-02
4.788159E+01	6.81488E+01	9.0164E-01	4.6906E+00	6.4355E-01	0.000E+00	2.589E-02
5.118542E+01	6.78932E+01	7.9799E-01	3.8834E+00	5.8988E-01	0.000E+00	2.422E-02
5.471721E+01	6.74763E+01	7.0656E-01	3.2165E+00	5.4102E-01	0.000E+00	2.266E-02
5.820181E+01	6.64210E+01	6.3175E-01	2.7038E+00	4.9976E-01	0.000E+00	2.130E-02
5.849270E+01	6.61954E+01	6.2608E-01	2.6662E+00	4.9659E-01	0.000E+00	2.120E-02
5.909265E+01	6.52863E+01	6.1465E-01	2.5909E+00	4.9016E-01	0.000E+00	2.098E-02
5.933021E+01	6.39276E+01	6.1021E-01	2.5619E+00	4.8766E-01	0.000E+00	2.090E-02
5.968655E+01	6.53004E+01	3.2783E+00	1.3682E+01	4.8396E-01	1.116E+01	2.077E-02
6.057739E+01	6.65405E+01	3.2050E+00	1.3179E+01	4.7493E-01	1.076E+01	2.047E-02
6.252870E+01	6.74400E+01	3.0529E+00	1.2162E+01	4.5625E-01	9.950E+00	1.983E-02
6.684318E+01	6.82358E+01	2.7418E+00	1.0217E+01	4.1968E-01	8.381E+00	1.855E-02
7.145536E+01	6.86397E+01	2.4583E+00	8.5696E+00	3.8655E-01	7.044E+00	1.735E-02
7.638578E+01	6.88894E+01	2.2038E+00	7.1865E+00	3.5658E-01	5.919E+00	1.623E-02
8.165640E+01	6.90612E+01	1.9726E+00	6.0174E+00	3.2947E-01	4.965E+00	1.518E-02
8.729069E+01	6.91715E+01	1.7598E+00	5.0217E+00	3.0499E-01	4.154E+00	1.420E-02
9.331374E+01	6.92436E+01	1.5702E+00	4.1914E+00	2.8287E-01	3.475E+00	1.329E-02
9.975239E+01	6.92898E+01	1.4011E+00	3.4988E+00	2.6290E-01	2.907E+00	1.243E-02
1.066353E+02	6.93180E+01	1.2505E+00	2.9211E+00	2.4487E-01	2.432E+00	1.163E-02
1.139931E+02	6.93333E+01	1.1162E+00	2.4390E+00	2.2859E-01	2.034E+00	1.088E-02
1.218587E+02	6.93682E+01	9.9475E-01	2.0334E+00	2.1388E-01	1.698E+00	1.017E-02
1.302669E+02	6.93651E+01	8.8429E-01	1.6909E+00	2.0058E-01	1.413E+00	9.518E-03
1.392553E+02	6.93557E+01	7.8617E-01	1.4063E+00	1.8854E-01	1.176E+00	8.903E-03
1.488640E+02	6.93424E+01	6.9900E-01	1.1696E+00	1.7762E-01	9.789E-01	8.329E-03
1.591356E+02	6.93265E+01	6.2156E-01	9.7292E-01	1.6771E-01	8.146E-01	7.791E-03
1.701159E+02	6.93090E+01	5.5275E-01	8.0936E-01	1.5869E-01	6.780E-01	7.288E-03
1.818539E+02	6.92906E+01	4.9159E-01	6.7336E-01	1.5047E-01	5.642E-01	6.818E-03
1.944018E+02	6.92719E+01	4.3724E-01	5.6025E-01	1.4295E-01	4.696E-01	6.378E-03
2.078156E+02	6.92532E+01	3.8893E-01	4.6619E-01	1.3605E-01	3.908E-01	5.966E-03
2.221548E+02	6.92348E+01	3.4599E-01	3.8795E-01	1.2970E-01	3.252E-01	5.581E-03
2.374835E+02	6.92169E+01	3.0781E-01	3.2286E-01	1.2384E-01	2.707E-01	5.221E-03
2.538699E+02	6.91994E+01	2.7387E-01	2.6871E-01	1.1841E-01	2.253E-01	4.884E-03
2.713869E+02	6.91828E+01	2.4486E-01	2.2474E-01	1.1335E-01	1.885E-01	4.569E-03
2.901126E+02	6.91677E+01	2.1921E-01	1.8821E-01	1.0863E-01	1.580E-01	4.274E-03
3.101304E+02	6.91538E+01	1.9626E-01	1.5763E-01	1.0420E-01	1.325E-01	3.998E-03
3.315294E+02	6.91410E+01	1.7572E-01	1.3203E-01	1.0003E-01	1.110E-01	3.740E-03
3.544049E+02	6.91291E+01	1.5735E-01	1.1059E-01	9.6087E-02	9.309E-02	3.498E-03
3.788588E+02	6.91182E+01	1.4090E-01	9.2641E-02	9.2345E-02	7.803E-02	3.273E-03
4.050001E+02	6.91081E+01	1.2618E-01	7.7609E-02	8.8783E-02	6.541E-02	3.061E-03
4.329451E+02	6.90987E+01	1.1301E-01	6.5020E-02	8.5379E-02	5.483E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 485

Yb Z = 70

Atomic weight = 1.730400E+02 g/mol, nominal density ρ (g/cm³) = 6.9530E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.87340E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.43183E+05

19 edges. Edge energies (keV):

K	6.13323E+00	L	I	1.04864E+00	L	II	9.97820E+00	L	III	8.94360E+00	
M	2.39810E+00	M	II	2.17300E+00	M	III	1.94980E+00	M	IV	1.57630E+00	
M	V	1.52780E+00	N	I	4.87200E-00	N	II	3.96700E-00	N	III	3.43500E-01
N	IV	1.98100E-00	N	V	1.84900E-00	O	I	6.30000E-03	O	II	6.30000E-03
O	III	5.41000E-02	N	VI	2.34000E-02	N	VII	2.34000E-02			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.2559E+00, -7.4880E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.5534E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
6.174000E-03	8.70177E+00	0.0000E+00	0.0000E+00	1.6844E-05	0.000E+00	2.008E+02
6.268500E-03	8.61958E+00	0.0000E+00	0.0000E+00	1.8235E-05	0.000E+00	1.978E+02
6.293700E-03	8.53448E+00	0.0000E+00	0.0000E+00	1.8621E-05	0.000E+00	1.970E+02
6.331500E-03	8.61150E+00	1.5997E-01	6.1442E+03	1.9211E-05	0.000E+00	1.958E+02
6.426000E-03	8.66995E+00	1.6048E-01	6.0730E+03	2.0748E-05	0.000E+00	1.929E+02
1.069000E-02	8.08034E+00	2.4028E-01	5.4660E+03	2.4930E-04	0.000E+00	1.160E+02
1.142761E-02	7.90296E+00	2.6322E-01	5.6013E+03	3.3771E-04	0.000E+00	1.085E+02
1.221612E-02	7.68974E+00	2.8998E-01	5.7726E+03	4.5515E-04	0.000E+00	1.015E+02
1.305903E-02	7.43114E+00	3.2108E-01	5.9790E+03	6.1032E-04	0.000E+00	9.494E+01
1.396010E-02	7.11351E+00	3.5710E-01	6.2206E+03	8.1429E-04	0.000E+00	8.881E+01
1.492335E-02	6.71672E+00	3.9875E-01	6.4978E+03	1.0810E-03	0.000E+00	8.308E+01
1.595306E-02	6.20942E+00	4.4685E-01	6.8116E+03	1.4279E-03	0.000E+00	7.772E+01
1.705382E-02	5.53952E+00	5.0232E-01	7.1630E+03	1.8768E-03	0.000E+00	7.270E+01
1.823053E-02	4.61228E+00	5.6624E-01	7.5533E+03	2.4547E-03	0.000E+00	6.801E+01
1.948844E-02	3.33375E+00	6.3982E-01	7.9839E+03	3.1950E-03	0.000E+00	6.362E+01
2.083314E-02	9.89324E-01	7.2443E-01	8.4562E+03	4.1382E-03	0.000E+00	5.951E+01
2.227063E-02	-4.40734E+00	8.2162E-01	8.9716E+03	5.3341E-03	0.000E+00	5.567E+01
2.293200E-02	-1.12079E+01	8.6864E-01	9.2115E+03	5.9533E-03	0.000E+00	5.407E+01
2.328300E-02	-2.32927E+01	8.9418E-01	9.3394E+03	6.3002E-03	0.000E+00	5.325E+01
2.337660E-02	-3.83698E+01	9.0106E-01	9.3736E+03	6.3949E-03	0.000E+00	5.304E+01
2.351700E-02	-2.18016E+01	3.0895E+01	3.1948E+05	6.5387E-03	0.000E+00	5.272E+01
2.380730E-02	-8.64846E+00	2.9627E+01	3.0263E+05	6.8426E-03	0.000E+00	5.208E+01
2.386800E-02	-7.13978E+00	2.9371E+01	2.9926E+05	6.9073E-03	0.000E+00	5.195E+01
2.545001E-02	8.78620E+00	2.3655E+01	2.2603E+05	8.7359E-03	0.000E+00	4.872E+01
2.720606E-02	1.42828E+01	1.8939E+01	1.6929E+05	1.1100E-02	0.000E+00	4.557E+01
2.908327E-02	1.66838E+01	1.5192E+01	1.2703E+05	1.4038E-02	0.000E+00	4.263E+01
3.109002E-02	1.76344E+01	1.2300E+01	9.6207E+04	1.7671E-02	0.000E+00	3.988E+01
3.323523E-02	1.78325E+01	1.0127E+01	7.4097E+04	2.2140E-02	0.000E+00	3.731E+01
3.552846E-02	1.76392E+01	8.5366E+00	5.8430E+04	2.7611E-02	0.000E+00	3.490E+01
3.797993E-02	1.72551E+01	7.4086E+00	4.7437E+04	3.4276E-02	0.000E+00	3.264E+01
4.060054E-02	1.67932E+01	6.6435E+00	3.9792E+04	4.2357E-02	0.000E+00	3.054E+01
4.340198E-02	1.63169E+01	6.1631E+00	3.4532E+04	5.2105E-02	0.000E+00	2.857E+01
4.639671E-02	1.58609E+01	5.9074E+00	3.0963E+04	6.3808E-02	0.000E+00	2.672E+01
4.959809E-02	1.54428E+01	5.8318E+00	2.8594E+04	7.7790E-02	0.000E+00	2.500E+01
5.302035E-02	1.50639E+01	5.9031E+00	2.7075E+04	9.4415E-02	0.000E+00	2.338E+01
5.382950E-02	1.49722E+01	5.9370E+00	2.6821E+04	9.8598E-02	0.000E+00	2.303E+01
5.404590E-02	1.49329E+01	5.9470E+00	2.6759E+04	9.9733E-02	0.000E+00	2.294E+01
5.437050E-02	1.49244E+01	6.0019E+00	2.6845E+04	1.0145E-01	0.000E+00	2.280E+01
5.518200E-02	1.48735E+01	6.0455E+00	2.6642E+04	1.0580E-01	0.000E+00	2.247E+01
5.667876E-02	1.47690E+01	6.1379E+00	2.6335E+04	1.1409E-01	0.000E+00	2.187E+01
6.058959E-02	1.45370E+01	6.4395E+00	2.5846E+04	1.3726E-01	0.000E+00	2.046E+01
6.477028E-02	1.43639E+01	6.8326E+00	2.5653E+04	1.6441E-01	0.000E+00	1.914E+01
6.923942E-02	1.42565E+01	7.3074E+00	2.5665E+04	1.9609E-01	0.000E+00	1.791E+01
7.401695E-02	1.42383E+01	7.8560E+00	2.5811E+04	2.3286E-01	0.000E+00	1.675E+01
7.912411E-02	1.42782E+01	8.4722E+00	2.6039E+04	2.7535E-01	0.000E+00	1.567E+01
8.458368E-02	1.44017E+01	9.1509E+00	2.6309E+04	3.2421E-01	0.000E+00	1.466E+01
9.041995E-02	1.46183E+01	9.8876E+00	2.6593E+04	3.8015E-01	0.000E+00	1.371E+01
9.665893E-02	1.49408E+01	1.0679E+01	2.6866E+04	4.4387E-01	0.000E+00	1.283E+01
1.033284E-01	1.53873E+01	1.1521E+01	2.7114E+04	5.1612E-01	0.000E+00	1.200E+01
1.104581E-01	1.59855E+01	1.2411E+01	2.7324E+04	5.9766E-01	0.000E+00	1.122E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
1.180797E-01	1.67794E+01	1.3345E+01	2.7485E+04	6.8926E-01	0.000E+00	1.050E+01
1.262272E-01	1.76931E+01	1.3721E+01	2.6434E+04	7.9167E-01	0.000E+00	9.822E+00
1.349368E-01	1.85556E+01	1.4022E+01	2.5270E+04	9.0563E-01	0.000E+00	9.188E+00
1.442475E-01	1.93574E+01	1.4258E+01	2.4037E+04	1.0319E+00	0.000E+00	8.595E+00
1.542005E-01	2.00562E+01	1.4425E+01	2.2749E+04	1.1710E+00	0.000E+00	8.040E+00
1.648404E-01	2.05356E+01	1.4521E+01	2.1422E+04	1.3237E+00	0.000E+00	7.521E+00
1.762144E-01	2.03091E+01	1.4544E+01	2.0072E+04	1.4904E+00	0.000E+00	7.036E+00
1.812020E-01	1.92579E+01	1.4533E+01	1.9503E+04	1.5645E+00	0.000E+00	6.842E+00
1.839755E-01	1.67441E+01	1.4521E+01	1.9194E+04	1.6058E+00	0.000E+00	6.739E+00
1.847151E-01	1.32587E+01	1.4517E+01	1.9112E+04	1.6169E+00	0.000E+00	6.712E+00
1.858245E-01	1.75972E+01	2.1569E+01	2.8226E+04	1.6335E+00	0.000E+00	6.672E+00
1.883732E-01	2.11451E+01	2.0604E+01	2.6598E+04	1.6717E+00	0.000E+00	6.582E+00
1.885980E-01	2.13076E+01	2.0525E+01	2.6466E+04	1.6750E+00	0.000E+00	6.574E+00
1.941380E-01	2.30226E+01	1.8887E+01	2.3658E+04	1.7584E+00	0.000E+00	6.386E+00
1.971095E-01	2.20414E+01	1.8198E+01	2.2452E+04	1.8033E+00	0.000E+00	6.290E+00
1.979019E-01	1.99674E+01	1.8033E+01	2.2159E+04	1.8152E+00	0.000E+00	6.265E+00
1.990905E-01	2.28638E+01	2.2254E+01	2.7183E+04	1.8332E+00	0.000E+00	6.228E+00
2.013709E-01	2.51673E+01	2.1356E+01	2.5791E+04	1.8677E+00	0.000E+00	6.157E+00
2.020620E-01	2.55620E+01	2.1105E+01	2.5400E+04	1.8782E+00	0.000E+00	6.136E+00
2.152655E-01	2.82182E+01	1.7830E+01	2.0142E+04	2.0788E+00	0.000E+00	5.760E+00
2.301188E-01	2.88034E+01	1.6144E+01	1.7060E+04	2.3050E+00	0.000E+00	5.388E+00
2.459970E-01	2.91777E+01	1.5266E+01	1.5091E+04	2.5461E+00	0.000E+00	5.040E+00
2.629708E-01	2.95510E+01	1.4683E+01	1.3578E+04	2.8020E+00	0.000E+00	4.715E+00
2.811158E-01	2.99033E+01	1.4230E+01	1.2310E+04	3.0721E+00	0.000E+00	4.410E+00
3.005128E-01	3.01906E+01	1.3849E+01	1.1207E+04	3.3560E+00	0.000E+00	4.126E+00
3.212482E-01	3.03301E+01	1.3522E+01	1.0236E+04	3.6527E+00	0.000E+00	3.859E+00
3.366300E-01	3.01196E+01	1.3322E+01	9.6236E+03	3.8678E+00	0.000E+00	3.683E+00
3.417825E-01	2.96525E+01	1.3262E+01	9.4360E+03	3.9389E+00	0.000E+00	3.628E+00
3.434143E-01	2.85099E+01	1.3244E+01	9.3783E+03	3.9613E+00	0.000E+00	3.610E+00
3.452175E-01	2.96927E+01	1.4446E+01	1.0176E+04	3.9859E+00	0.000E+00	3.591E+00
3.503700E-01	3.02947E+01	1.4404E+01	9.9977E+03	4.0561E+00	0.000E+00	3.539E+00
3.671099E-01	3.09747E+01	1.4291E+01	9.4665E+03	4.2805E+00	0.000E+00	3.377E+00
3.887660E-01	3.13983E+01	1.4185E+01	8.8730E+03	4.5622E+00	0.000E+00	3.189E+00
3.924405E-01	3.14140E+01	1.4171E+01	8.7811E+03	4.6090E+00	0.000E+00	3.159E+00
3.947165E-01	3.13826E+01	1.4162E+01	8.7253E+03	4.6379E+00	0.000E+00	3.141E+00
3.963033E-01	3.12477E+01	1.4157E+01	8.6870E+03	4.6579E+00	0.000E+00	3.129E+00
3.986835E-01	3.14629E+01	1.4477E+01	8.8305E+03	4.6879E+00	0.000E+00	3.110E+00
4.046340E-01	3.17261E+01	1.4464E+01	8.6925E+03	4.7623E+00	0.000E+00	3.064E+00
4.195189E-01	3.21194E+01	1.4438E+01	8.3691E+03	4.9452E+00	0.000E+00	2.955E+00
4.484657E-01	3.26976E+01	1.4411E+01	7.8145E+03	5.2875E+00	0.000E+00	2.765E+00
4.774560E-01	3.30809E+01	1.4398E+01	7.3334E+03	5.6125E+00	0.000E+00	2.597E+00
4.794098E-01	3.30841E+01	1.4397E+01	7.3031E+03	5.6338E+00	0.000E+00	2.586E+00
4.847640E-01	3.30018E+01	1.4395E+01	7.2211E+03	5.6917E+00	0.000E+00	2.558E+00
4.867128E-01	3.27773E+01	1.4394E+01	7.1918E+03	5.7126E+00	0.000E+00	2.547E+00
4.896360E-01	3.30982E+01	1.4907E+01	7.4037E+03	5.7438E+00	0.000E+00	2.532E+00
4.969440E-01	3.34703E+01	1.4906E+01	7.2944E+03	5.8212E+00	0.000E+00	2.495E+00
5.124891E-01	3.39342E+01	1.4901E+01	7.0708E+03	5.9821E+00	0.000E+00	2.419E+00
5.478508E-01	3.47636E+01	1.4867E+01	6.5994E+03	6.3304E+00	0.000E+00	2.263E+00
5.856525E-01	3.55708E+01	1.4785E+01	6.1391E+03	6.6763E+00	0.000E+00	2.117E+00
6.260625E-01	3.63291E+01	1.4639E+01	5.6863E+03	7.0175E+00	0.000E+00	1.980E+00
6.692609E-01	3.70420E+01	1.4424E+01	5.2410E+03	7.3517E+00	0.000E+00	1.853E+00
7.154399E-01	3.76948E+01	1.4137E+01	4.8053E+03	7.6764E+00	0.000E+00	1.733E+00
7.648052E-01	3.82649E+01	1.3783E+01	4.3825E+03	7.9894E+00	0.000E+00	1.621E+00
8.175768E-01	3.87244E+01	1.3364E+01	3.9750E+03	8.2883E+00	0.000E+00	1.516E+00
8.739896E-01	3.90400E+01	1.2890E+01	3.5866E+03	8.5709E+00	0.000E+00	1.419E+00
9.342948E-01	3.91793E+01	1.2387E+01	3.2241E+03	8.8350E+00	0.000E+00	1.327E+00
9.987612E-01	3.91158E+01	1.1875E+01	2.8914E+03	9.0787E+00	0.000E+00	1.241E+00
1.067676E+00	3.86211E+01	1.0921E+01	2.4875E+03	9.3000E+00	0.000E+00	1.161E+00
1.141345E+00	3.74204E+01	1.0057E+01	2.1428E+03	9.4975E+00	0.000E+00	1.086E+00
1.220098E+00	3.53752E+01	9.2797E+00	1.8496E+03	9.6695E+00	0.000E+00	1.016E+00
1.304285E+00	3.18326E+01	8.5795E+00	1.5996E+03	9.8149E+00	0.000E+00	9.506E-01
1.394281E+00	2.45968E+01	7.9424E+00	1.3853E+03	9.9327E+00	0.000E+00	8.892E-01
1.490486E+00	-2.16107E+00	7.3498E+00	1.1992E+03	1.0022E+01	0.000E+00	8.318E-01
1.497244E+00	-7.57982E+00	7.3117E+00	1.1876E+03	1.0027E+01	0.000E+00	8.281E-01
1.520161E+00	-5.41230E+01	7.1858E+00	1.1495E+03	1.0043E+01	0.000E+00	8.156E-01

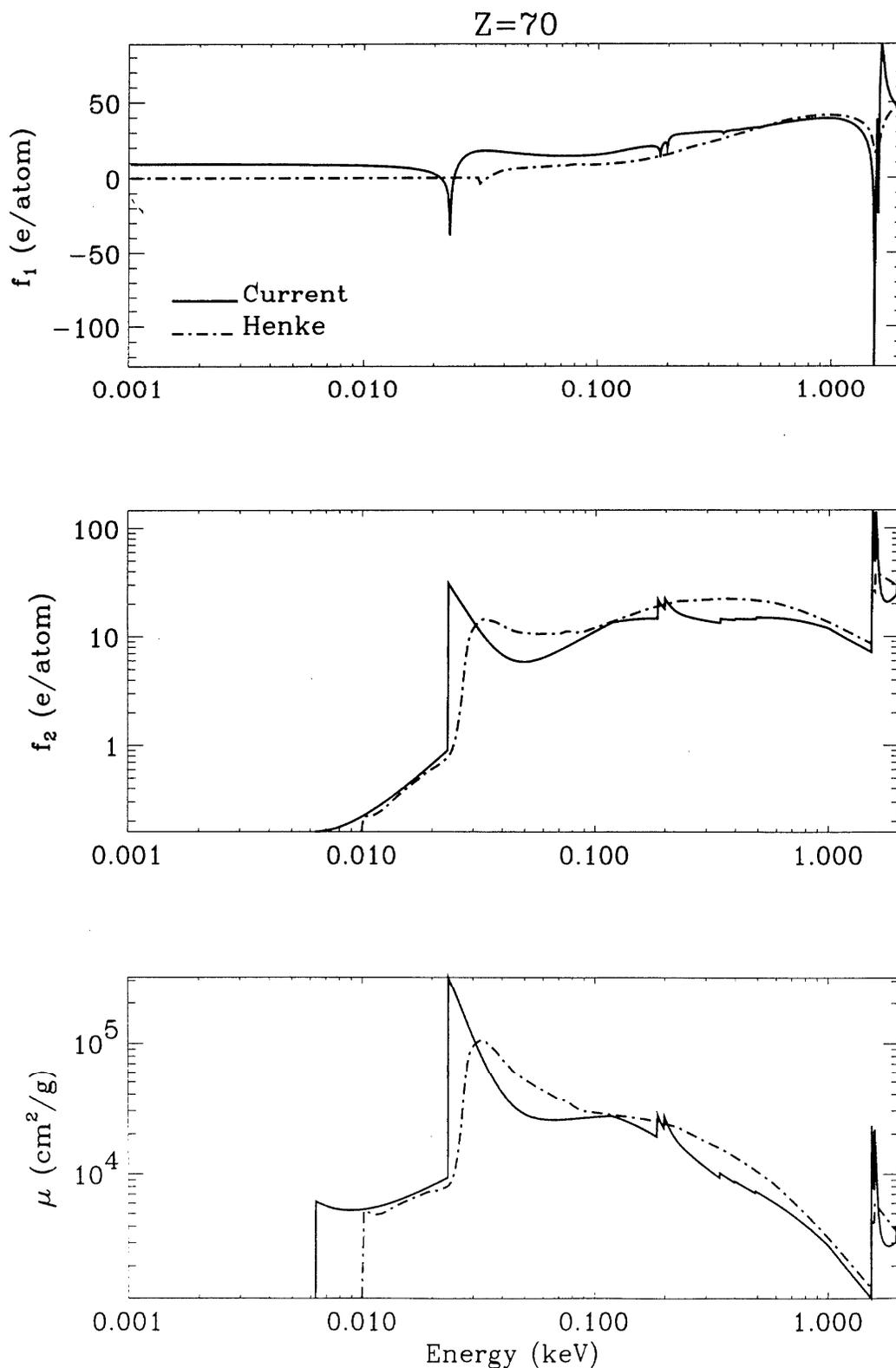
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 487

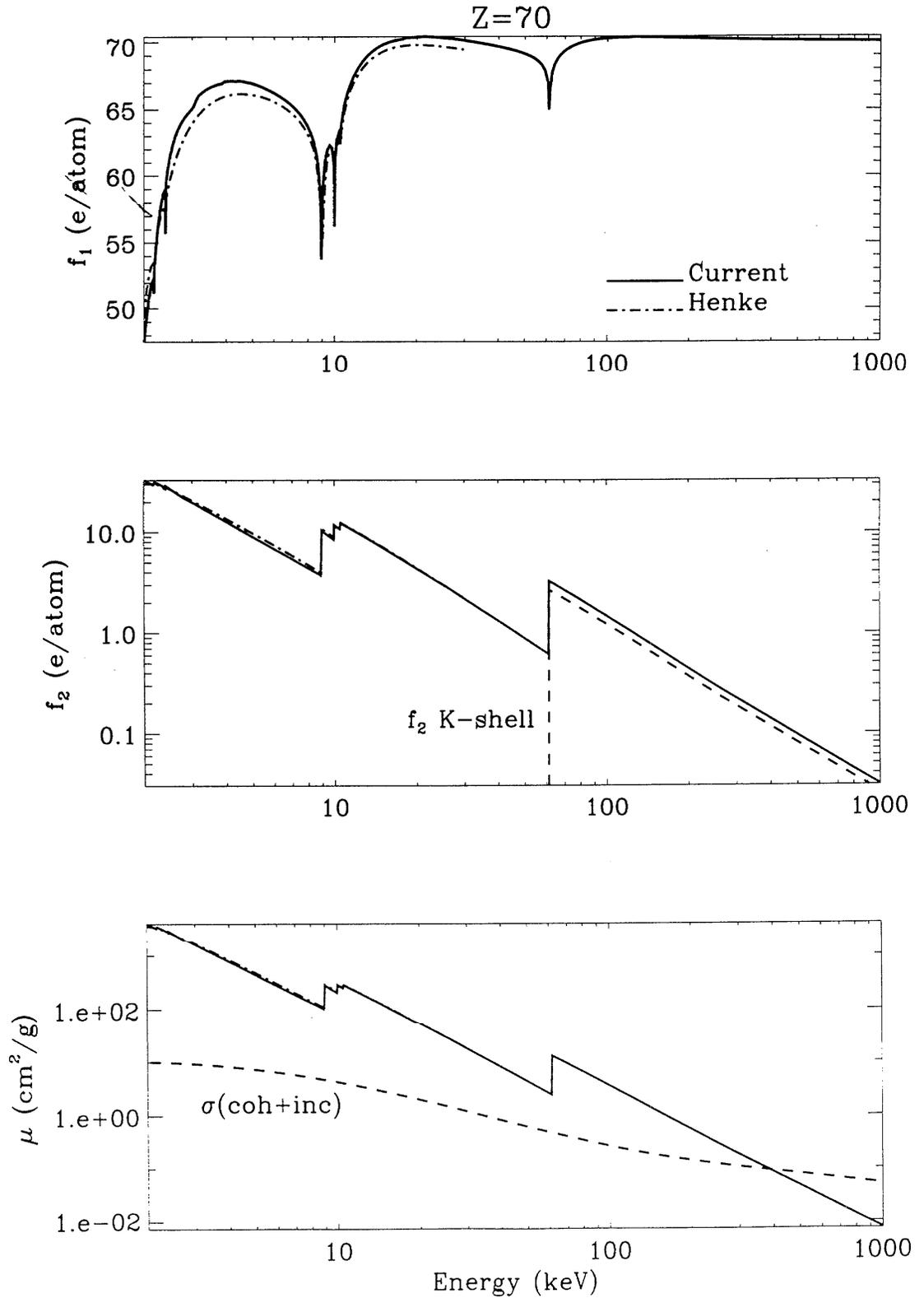
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.526272E+00	-1.26155E+02	7.1531E+00	1.1397E+03	1.0047E+01	0.000E+00	8.123E-01
1.535439E+00	-1.16276E+01	1.4669E+02	2.3232E+04	1.0053E+01	0.000E+00	8.075E-01
1.544774E+00	2.96204E+01	1.1164E+02	1.7574E+04	1.0058E+01	0.000E+00	8.026E-01
1.558356E+00	3.96665E+01	7.5914E+01	1.1846E+04	1.0066E+01	0.000E+00	7.956E-01
1.568419E+00	2.42380E+01	5.7665E+01	8.9410E+03	1.0071E+01	0.000E+00	7.905E-01
1.574724E+00	-2.40186E+01	4.8810E+01	7.5377E+03	1.0074E+01	0.000E+00	7.873E-01
1.584182E+00	-5.43398E+01	1.3339E+02	2.0476E+04	1.0079E+01	0.000E+00	7.826E-01
1.593329E+00	8.11121E+01	1.0265E+02	1.5666E+04	1.0083E+01	0.000E+00	7.781E-01
1.607826E+00	8.94940E+01	6.9882E+01	1.0570E+04	1.0089E+01	0.000E+00	7.711E-01
1.703269E+00	6.12442E+01	2.2273E+01	3.1800E+03	1.0114E+01	0.000E+00	7.279E-01
1.820795E+00	4.98030E+01	2.1168E+01	2.8271E+03	1.0117E+01	0.000E+00	6.809E-01
1.910804E+00	4.58638E+01	2.3166E+01	2.9483E+03	1.0101E+01	0.000E+00	6.489E-01
1.940051E+00	4.37542E+01	2.4002E+01	3.0086E+03	1.0093E+01	0.000E+00	6.391E-01
1.946430E+00	4.21843E+01	2.4189E+01	3.0221E+03	1.0091E+01	0.000E+00	6.370E-01
1.947850E+00	4.13622E+01	2.4231E+01	3.0251E+03	1.0090E+01	0.000E+00	6.365E-01
1.959549E+00	4.39146E+01	2.9333E+01	3.6402E+03	1.0087E+01	0.000E+00	6.327E-01
1.988796E+00	4.65714E+01	2.9976E+01	3.6653E+03	1.0076E+01	0.000E+00	6.234E-01
2.080733E+00	5.05083E+01	3.0504E+01	3.5651E+03	1.0036E+01	0.000E+00	5.959E-01
2.129540E+00	5.19250E+01	3.0297E+01	3.4597E+03	1.0011E+01	0.000E+00	5.822E-01
2.162135E+00	5.22474E+01	3.0031E+01	3.3777E+03	9.9926E+00	0.000E+00	5.734E-01
2.170827E+00	5.15689E+01	2.9944E+01	3.3545E+03	9.9875E+00	0.000E+00	5.711E-01
2.183865E+00	5.29791E+01	3.1702E+01	3.5302E+03	9.9798E+00	0.000E+00	5.677E-01
2.216460E+00	5.48545E+01	3.1211E+01	3.4244E+03	9.9596E+00	0.000E+00	5.594E-01
2.224304E+00	5.51847E+01	3.1082E+01	3.3982E+03	9.9546E+00	0.000E+00	5.574E-01
2.350138E+00	5.86219E+01	2.8721E+01	2.9719E+03	9.8672E+00	0.000E+00	5.276E-01
2.377781E+00	5.89268E+01	2.8167E+01	2.8808E+03	9.8463E+00	0.000E+00	5.214E-01
2.386109E+00	5.89060E+01	2.8000E+01	2.8536E+03	9.8399E+00	0.000E+00	5.196E-01
2.395702E+00	5.85005E+01	2.7807E+01	2.8226E+03	9.8325E+00	0.000E+00	5.175E-01
2.410090E+00	5.93790E+01	2.8690E+01	2.8949E+03	9.8213E+00	0.000E+00	5.144E-01
2.446062E+00	6.05356E+01	2.7956E+01	2.7793E+03	9.7927E+00	0.000E+00	5.069E-01
2.541848E+00	6.22400E+01	2.6084E+01	2.4955E+03	9.7128E+00	0.000E+00	4.878E-01
2.717235E+00	6.38676E+01	2.3146E+01	2.0715E+03	9.5553E+00	0.000E+00	4.563E-01
2.904724E+00	6.47398E+01	2.0817E+01	1.7428E+03	9.3754E+00	0.000E+00	4.268E-01
3.105150E+00	6.57017E+01	1.8901E+01	1.4802E+03	9.1748E+00	0.000E+00	3.993E-01
3.319406E+00	6.64037E+01	1.7037E+01	1.2482E+03	8.9552E+00	0.000E+00	3.735E-01
3.548445E+00	6.67355E+01	1.5369E+01	1.0533E+03	8.7185E+00	0.000E+00	3.494E-01
3.793288E+00	6.69256E+01	1.3879E+01	8.8977E+02	8.4666E+00	0.000E+00	3.269E-01
4.055024E+00	6.71293E+01	1.2519E+01	7.5078E+02	8.2015E+00	0.000E+00	3.058E-01
4.334821E+00	6.71246E+01	1.1292E+01	6.3346E+02	7.9251E+00	0.000E+00	2.860E-01
4.633924E+00	6.70963E+01	1.0172E+01	5.3381E+02	7.6394E+00	0.000E+00	2.676E-01
4.953664E+00	6.69694E+01	9.1701E+00	4.5017E+02	7.3464E+00	0.000E+00	2.503E-01
5.295467E+00	6.67626E+01	8.2727E+00	3.7991E+02	7.0479E+00	0.000E+00	2.341E-01
5.660855E+00	6.65036E+01	7.4733E+00	3.2104E+02	6.7458E+00	0.000E+00	2.190E-01
6.051453E+00	6.61931E+01	6.7601E+00	2.7166E+02	6.4419E+00	0.000E+00	2.049E-01
6.469004E+00	6.58226E+01	6.1228E+00	2.3017E+02	6.1379E+00	0.000E+00	1.917E-01
6.915365E+00	6.53663E+01	5.5324E+00	1.9455E+02	5.8352E+00	0.000E+00	1.793E-01
7.392525E+00	6.47554E+01	4.9914E+00	1.6420E+02	5.5353E+00	0.000E+00	1.677E-01
7.902609E+00	6.38684E+01	4.5094E+00	1.3876E+02	5.2396E+00	0.000E+00	1.569E-01
8.447890E+00	6.22694E+01	4.0808E+00	1.1747E+02	4.9493E+00	0.000E+00	1.468E-01
8.764728E+00	6.01186E+01	3.8563E+00	1.0700E+02	4.7918E+00	0.000E+00	1.415E-01
8.898882E+00	5.71931E+01	3.7678E+00	1.0297E+02	4.7275E+00	0.000E+00	1.393E-01
8.934656E+00	5.37535E+01	3.7409E+00	1.0182E+02	4.7105E+00	0.000E+00	1.388E-01
8.988318E+00	5.72170E+01	1.0431E+01	2.8220E+02	4.6853E+00	0.000E+00	1.379E-01
9.030794E+00	5.86884E+01	1.0321E+01	2.7791E+02	4.6655E+00	0.000E+00	1.373E-01
9.122472E+00	6.02430E+01	1.0089E+01	2.6895E+02	4.6231E+00	0.000E+00	1.359E-01
9.653919E+00	6.22929E+01	8.9588E+00	2.2567E+02	4.3891E+00	0.000E+00	1.284E-01
9.778636E+00	6.20963E+01	8.7436E+00	2.1744E+02	4.3368E+00	0.000E+00	1.268E-01
9.928309E+00	6.09185E+01	8.5005E+00	2.0821E+02	4.2754E+00	0.000E+00	1.249E-01
9.968222E+00	5.92549E+01	8.4382E+00	2.0586E+02	4.2592E+00	0.000E+00	1.244E-01
1.002809E+01	6.10691E+01	1.1721E+01	2.8424E+02	4.2352E+00	0.000E+00	1.236E-01
1.017776E+01	6.27204E+01	1.1387E+01	2.7208E+02	4.1760E+00	0.000E+00	1.218E-01
1.027667E+01	6.31439E+01	1.1176E+01	2.6446E+02	4.1375E+00	0.000E+00	1.206E-01
1.032004E+01	6.32436E+01	1.1086E+01	2.6122E+02	4.1209E+00	0.000E+00	1.201E-01
1.043397E+01	6.31156E+01	1.0854E+01	2.5298E+02	4.0776E+00	0.000E+00	1.188E-01
1.047591E+01	6.24005E+01	1.0772E+01	2.5005E+02	4.0618E+00	0.000E+00	1.184E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_x cm ² /g	λ nm
1.053883E+01	6.34667E+01	1.2356E+01	2.8511E+02	4.0384E+00	0.000E+00	1.176E-01
1.069613E+01	6.46852E+01	1.2066E+01	2.7434E+02	3.9807E+00	0.000E+00	1.159E-01
1.103212E+01	6.59637E+01	1.1498E+01	2.5345E+02	3.8616E+00	0.000E+00	1.124E-01
1.179334E+01	6.75511E+01	1.0372E+01	2.1388E+02	3.6119E+00	0.000E+00	1.051E-01
1.260708E+01	6.85201E+01	9.3393E+00	1.8015E+02	3.3722E+00	0.000E+00	9.834E-02
1.347697E+01	6.91784E+01	8.3938E+00	1.5146E+02	3.1428E+00	0.000E+00	9.200E-02
1.440688E+01	6.96219E+01	7.5242E+00	1.2700E+02	2.9240E+00	0.000E+00	8.606E-02
1.540095E+01	6.99154E+01	6.7398E+00	1.0642E+02	2.7159E+00	0.000E+00	8.050E-02
1.646362E+01	7.01045E+01	6.0368E+00	8.9170E+01	2.5186E+00	0.000E+00	7.531E-02
1.759961E+01	7.02200E+01	5.4096E+00	7.4747E+01	2.3321E+00	0.000E+00	7.045E-02
1.881398E+01	7.03448E+01	4.8427E+00	6.2595E+01	2.1563E+00	0.000E+00	6.590E-02
2.011215E+01	7.03981E+01	4.3363E+00	5.2432E+01	1.9910E+00	0.000E+00	6.165E-02
2.149988E+01	7.04166E+01	3.8790E+00	4.3875E+01	1.8359E+00	0.000E+00	5.767E-02
2.298338E+01	7.03806E+01	3.4684E+00	3.6699E+01	1.6909E+00	0.000E+00	5.395E-02
2.456923E+01	7.03291E+01	3.1040E+00	3.0723E+01	1.5556E+00	0.000E+00	5.046E-02
2.626450E+01	7.02721E+01	2.7802E+00	2.5742E+01	1.4297E+00	0.000E+00	4.721E-02
2.807676E+01	7.02074E+01	2.4723E+00	2.1413E+01	1.3128E+00	0.000E+00	4.416E-02
3.001405E+01	7.01192E+01	2.1945E+00	1.7780E+01	1.2045E+00	0.000E+00	4.131E-02
3.208502E+01	7.00208E+01	1.9495E+00	1.4776E+01	1.1043E+00	0.000E+00	3.864E-02
3.429889E+01	6.99157E+01	1.7332E+00	1.2289E+01	1.0120E+00	0.000E+00	3.615E-02
3.666551E+01	6.98048E+01	1.5421E+00	1.0228E+01	9.2696E-01	0.000E+00	3.381E-02
3.919543E+01	6.96878E+01	1.3727E+00	8.5168E+00	8.4886E-01	0.000E+00	3.163E-02
4.189992E+01	6.95608E+01	1.2204E+00	7.0830E+00	7.7725E-01	0.000E+00	2.959E-02
4.479101E+01	6.94188E+01	1.0847E+00	5.8890E+00	7.1172E-01	0.000E+00	2.768E-02
4.788159E+01	6.92508E+01	9.6081E-01	4.8798E+00	6.5185E-01	0.000E+00	2.589E-02
5.118542E+01	6.90346E+01	8.5078E-01	4.0421E+00	5.9725E-01	0.000E+00	2.422E-02
5.471721E+01	6.87183E+01	7.5329E-01	3.3479E+00	5.4754E-01	0.000E+00	2.266E-02
5.849270E+01	6.80890E+01	6.6748E-01	2.7750E+00	5.0234E-01	0.000E+00	2.120E-02
6.010565E+01	6.74370E+01	6.3550E-01	2.5712E+00	4.8512E-01	0.000E+00	2.063E-02
6.102564E+01	6.63087E+01	6.1835E-01	2.4641E+00	4.7580E-01	0.000E+00	2.032E-02
6.127097E+01	6.49576E+01	6.1390E-01	2.4366E+00	4.7338E-01	0.000E+00	2.024E-02
6.163896E+01	6.63231E+01	3.2671E+00	1.2890E+01	4.6978E-01	1.049E+01	2.011E-02
6.252870E+01	6.75338E+01	3.1960E+00	1.2430E+01	4.6130E-01	1.013E+01	1.983E-02
6.255894E+01	6.75565E+01	3.1936E+00	1.2414E+01	4.6102E-01	1.012E+01	1.982E-02
6.684318E+01	6.89414E+01	2.8776E+00	1.0469E+01	4.2409E-01	8.558E+00	1.855E-02
7.145536E+01	6.94756E+01	2.5819E+00	8.7868E+00	3.9039E-01	7.199E+00	1.735E-02
7.638578E+01	6.97851E+01	2.3152E+00	7.3706E+00	3.5989E-01	6.051E+00	1.623E-02
8.165640E+01	6.99894E+01	2.0735E+00	6.1750E+00	3.3233E-01	5.080E+00	1.518E-02
8.729069E+01	7.01221E+01	1.8505E+00	5.1554E+00	3.0742E-01	4.252E+00	1.420E-02
9.331374E+01	7.02094E+01	1.6518E+00	4.3047E+00	2.8493E-01	3.559E+00	1.329E-02
9.975239E+01	7.02663E+01	1.4746E+00	3.5949E+00	2.6463E-01	2.978E+00	1.243E-02
1.066353E+02	7.03022E+01	1.3166E+00	3.0026E+00	2.4631E-01	2.493E+00	1.163E-02
1.139931E+02	7.03230E+01	1.1757E+00	2.5081E+00	2.2976E-01	2.086E+00	1.088E-02
1.218587E+02	7.03335E+01	1.0500E+00	2.0954E+00	2.1482E-01	1.746E+00	1.017E-02
1.302669E+02	7.03634E+01	9.3416E-01	1.7439E+00	2.0131E-01	1.455E+00	9.518E-03
1.392553E+02	7.03570E+01	8.3084E-01	1.4509E+00	1.8909E-01	1.211E+00	8.903E-03
1.488640E+02	7.03456E+01	7.3901E-01	1.2072E+00	1.7802E-01	1.008E+00	8.329E-03
1.591356E+02	7.03310E+01	6.5740E-01	1.0046E+00	1.6798E-01	8.396E-01	7.791E-03
1.701159E+02	7.03144E+01	5.8485E-01	8.3605E-01	1.5884E-01	6.991E-01	7.288E-03
1.818539E+02	7.02967E+01	5.2036E-01	6.9584E-01	1.5051E-01	5.820E-01	6.818E-03
1.944018E+02	7.02783E+01	4.6302E-01	5.7920E-01	1.4291E-01	4.846E-01	6.378E-03
2.078156E+02	7.02598E+01	4.1203E-01	4.8215E-01	1.3593E-01	4.035E-01	5.966E-03
2.221548E+02	7.02414E+01	3.6668E-01	4.0139E-01	1.2952E-01	3.359E-01	5.581E-03
2.374835E+02	7.02234E+01	3.2635E-01	3.3419E-01	1.2360E-01	2.797E-01	5.221E-03
2.538699E+02	7.02059E+01	2.9048E-01	2.7826E-01	1.1812E-01	2.329E-01	4.884E-03
2.713869E+02	7.01888E+01	2.5909E-01	2.3216E-01	1.1302E-01	1.944E-01	4.569E-03
2.901126E+02	7.01732E+01	2.3212E-01	1.9457E-01	1.0827E-01	1.631E-01	4.274E-03
3.101304E+02	7.01589E+01	2.0797E-01	1.6308E-01	1.0381E-01	1.368E-01	3.998E-03
3.315294E+02	7.01457E+01	1.8635E-01	1.3669E-01	9.9612E-02	1.148E-01	3.740E-03
3.544049E+02	7.01335E+01	1.6699E-01	1.1458E-01	9.5648E-02	9.629E-02	3.498E-03
3.788588E+02	7.01223E+01	1.4965E-01	9.6057E-02	9.1890E-02	8.078E-02	3.273E-03
4.050001E+02	7.01119E+01	1.3412E-01	8.0531E-02	8.8313E-02	6.777E-02	3.061E-03
4.329451E+02	7.01023E+01	1.2020E-01	6.7518E-02	8.4897E-02	5.686E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 491

Lu Z = 71

atomic weight = 1.749670E+02 g/mol, nominal density ρ (g/cm³) = 9.8110E+00

μ_0 (barns/atom) = μ (cm²/g) \times 2.90540E+02, E(eV) μ (cm²/g) = f_2 (e/atom) \times 2.40504E+05

edges. Edge energies (keV):

K		6.33138E+00	L	I	1.08704E+00	L	II	1.03486E+00	L	III	9.24410E+00
M	I	2.49120E+00	M	II	2.26350E+00	M	III	2.02360E+00	M	IV	1.63940E+00
M	V	1.58850E+00	N	I	5.06200E-00	N	II	4.10100E-00	N	III	3.59300E-01
N	IV	2.04800E-00	N	V	1.95000E-00	O	I	6.90000E-03	O	II	6.90000E-03
O	III	5.68000E-02	N	VI	2.80000E-02	N	VII	2.80000E-02			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.3030E+00, -7.7580E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.5805E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
6.76200E-03	1.09733E+01	0.0000E+00	0.0000E+00	2.7418E-05	0.000E+00	1.834E+02
6.865500E-03	1.07902E+01	0.0000E+00	0.0000E+00	2.9631E-05	0.000E+00	1.806E+02
6.893100E-03	1.05760E+01	0.0000E+00	0.0000E+00	3.0244E-05	0.000E+00	1.799E+02
6.934500E-03	1.07961E+01	4.1866E-01	1.4520E+04	3.1180E-05	0.000E+00	1.788E+02
7.038000E-03	1.09845E+01	4.0834E-01	1.3954E+04	3.3618E-05	0.000E+00	1.762E+02
1.069000E-02	1.10473E+01	2.7823E-01	6.2595E+03	2.5273E-04	0.000E+00	1.160E+02
1.142761E-02	1.09705E+01	2.8190E-01	5.9328E+03	3.4226E-04	0.000E+00	1.085E+02
1.221612E-02	1.08782E+01	2.9040E-01	5.7172E+03	4.6115E-04	0.000E+00	1.015E+02
1.305903E-02	1.07684E+01	3.0371E-01	5.5933E+03	6.1821E-04	0.000E+00	9.494E+01
1.396010E-02	1.06376E+01	3.2202E-01	5.5478E+03	8.2459E-04	0.000E+00	8.881E+01
1.492335E-02	1.04815E+01	3.4570E-01	5.5713E+03	1.0944E-03	0.000E+00	8.308E+01
1.595306E-02	1.02939E+01	3.7529E-01	5.6577E+03	1.4453E-03	0.000E+00	7.772E+01
1.705382E-02	1.00658E+01	4.1148E-01	5.8030E+03	1.8992E-03	0.000E+00	7.270E+01
1.823053E-02	9.78414E+00	4.5519E-01	6.0050E+03	2.4835E-03	0.000E+00	6.801E+01
1.948844E-02	9.42840E+00	5.0748E-01	6.2628E+03	3.2317E-03	0.000E+00	6.362E+01
2.083314E-02	8.84927E+00	5.6964E-01	6.5761E+03	4.1850E-03	0.000E+00	5.951E+01
2.227063E-02	8.21276E+00	6.4316E-01	6.9456E+03	5.3935E-03	0.000E+00	5.567E+01
2.380730E-02	7.26572E+00	7.2979E-01	7.3724E+03	6.9176E-03	0.000E+00	5.208E+01
2.545001E-02	5.62002E+00	8.3149E-01	7.8576E+03	8.8302E-03	0.000E+00	4.872E+01
2.720606E-02	1.17691E+00	9.5050E-01	8.4025E+03	1.1218E-02	0.000E+00	4.557E+01
2.744000E-02	-2.78294E-01	9.6715E-01	8.4768E+03	1.1564E-02	0.000E+00	4.518E+01
2.786000E-02	-6.41303E+00	9.9751E-01	8.6111E+03	1.2202E-02	0.000E+00	4.450E+01
2.797200E-02	-1.39079E+01	1.0057E+00	8.6470E+03	1.2376E-02	0.000E+00	4.432E+01
2.814000E-02	-5.90857E+00	1.5849E+01	1.3546E+05	1.2640E-02	0.000E+00	4.406E+01
2.856000E-02	1.14942E+00	1.5393E+01	1.2962E+05	1.3314E-02	0.000E+00	4.341E+01
2.908327E-02	4.64754E+00	1.4857E+01	1.2286E+05	1.4185E-02	0.000E+00	4.263E+01
3.109002E-02	1.02590E+01	1.3092E+01	1.0127E+05	1.7854E-02	0.000E+00	3.988E+01
3.323523E-02	1.28947E+01	1.1446E+01	8.2827E+04	2.2366E-02	0.000E+00	3.731E+01
3.552846E-02	1.43130E+01	9.9275E+00	6.7202E+04	2.7890E-02	0.000E+00	3.490E+01
3.797993E-02	1.50174E+01	8.6395E+00	5.4709E+04	3.4619E-02	0.000E+00	3.264E+01
4.060054E-02	1.52796E+01	7.6209E+00	4.5144E+04	4.2776E-02	0.000E+00	3.054E+01
4.340198E-02	1.52719E+01	6.8706E+00	3.8072E+04	5.2616E-02	0.000E+00	2.857E+01
4.639671E-02	1.51082E+01	6.3673E+00	3.3006E+04	6.4428E-02	0.000E+00	2.672E+01
4.959809E-02	1.48634E+01	6.0817E+00	2.9490E+04	7.8541E-02	0.000E+00	2.500E+01
5.302035E-02	1.45849E+01	5.9838E+00	2.7143E+04	9.5321E-02	0.000E+00	2.338E+01
5.66400E-02	1.43716E+01	6.0153E+00	2.5990E+04	1.0947E-01	0.000E+00	2.227E+01
5.651600E-02	1.42925E+01	6.0412E+00	2.5708E+04	1.1425E-01	0.000E+00	2.194E+01
5.667876E-02	1.42695E+01	6.0469E+00	2.5659E+04	1.1518E-01	0.000E+00	2.187E+01
5.674320E-02	1.42545E+01	6.0493E+00	2.5640E+04	1.1554E-01	0.000E+00	2.185E+01
5.708400E-02	1.42534E+01	6.1060E+00	2.5725E+04	1.1750E-01	0.000E+00	2.172E+01
5.793600E-02	1.42164E+01	6.1436E+00	2.5503E+04	1.2245E-01	0.000E+00	2.140E+01
6.058959E-02	1.40740E+01	6.2959E+00	2.4991E+04	1.3856E-01	0.000E+00	2.046E+01
6.477028E-02	1.38832E+01	6.6220E+00	2.4589E+04	1.6597E-01	0.000E+00	1.914E+01
6.923942E-02	1.37405E+01	7.0540E+00	2.4502E+04	1.9794E-01	0.000E+00	1.791E+01
7.401695E-02	1.36575E+01	7.5802E+00	2.4631E+04	2.3505E-01	0.000E+00	1.675E+01
7.912411E-02	1.36432E+01	8.1914E+00	2.4898E+04	2.7794E-01	0.000E+00	1.567E+01
8.458368E-02	1.37230E+01	8.8798E+00	2.5249E+04	3.2726E-01	0.000E+00	1.466E+01
9.041995E-02	1.38739E+01	9.6388E+00	2.5638E+04	3.8372E-01	0.000E+00	1.371E+01
9.665893E-02	1.41238E+01	1.0463E+01	2.6034E+04	4.4805E-01	0.000E+00	1.283E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.033284E-01	1.44869E+01	1.1347E+01	2.6412E+04	5.2099E-01	0.000E+00	1.200E+01
1.104581E-01	1.49825E+01	1.2287E+01	2.6754E+04	6.0332E-01	0.000E+00	1.122E+01
1.180797E-01	1.56383E+01	1.3279E+01	2.7047E+04	6.9581E-01	0.000E+00	1.050E+01
1.262272E-01	1.64979E+01	1.4320E+01	2.7284E+04	7.9922E-01	0.000E+00	9.822E+00
1.349368E-01	1.75738E+01	1.4980E+01	2.6699E+04	9.1432E-01	0.000E+00	9.188E+00
1.442475E-01	1.86241E+01	1.5316E+01	2.5537E+04	1.0418E+00	0.000E+00	8.595E+00
1.542005E-01	1.96118E+01	1.5575E+01	2.4293E+04	1.1824E+00	0.000E+00	8.040E+00
1.648404E-01	2.05046E+01	1.5752E+01	2.2983E+04	1.3366E+00	0.000E+00	7.521E+00
1.762144E-01	2.12016E+01	1.5845E+01	2.1626E+04	1.5051E+00	0.000E+00	7.036E+00
1.883732E-01	2.12153E+01	1.5854E+01	2.0241E+04	1.6883E+00	0.000E+00	6.582E+00
1.911000E-01	2.08430E+01	1.5844E+01	1.9940E+04	1.7297E+00	0.000E+00	6.488E+00
1.940250E-01	1.94048E+01	1.5830E+01	1.9623E+04	1.7742E+00	0.000E+00	6.390E+00
1.948050E-01	1.73961E+01	1.5826E+01	1.9539E+04	1.7861E+00	0.000E+00	6.365E+00
1.959750E-01	1.98220E+01	1.9893E+01	2.4413E+04	1.8040E+00	0.000E+00	6.327E+00
1.989000E-01	2.19023E+01	1.9423E+01	2.3485E+04	1.8487E+00	0.000E+00	6.233E+00
2.007040E-01	2.23681E+01	1.9159E+01	2.2958E+04	1.8763E+00	0.000E+00	6.177E+00
2.013709E-01	2.24553E+01	1.9066E+01	2.2771E+04	1.8865E+00	0.000E+00	6.157E+00
2.037760E-01	2.21493E+01	1.8750E+01	2.2130E+04	1.9233E+00	0.000E+00	6.084E+00
2.045952E-01	2.09451E+01	1.8649E+01	2.1922E+04	1.9359E+00	0.000E+00	6.060E+00
2.058240E-01	2.28166E+01	2.1272E+01	2.4856E+04	1.9547E+00	0.000E+00	6.024E+00
2.088960E-01	2.47351E+01	2.0628E+01	2.3750E+04	2.0019E+00	0.000E+00	5.935E+00
2.152655E-01	2.63669E+01	1.9511E+01	2.1798E+04	2.0999E+00	0.000E+00	5.760E+00
2.301188E-01	2.78593E+01	1.7836E+01	1.8641E+04	2.3285E+00	0.000E+00	5.388E+00
2.459970E-01	2.86479E+01	1.6903E+01	1.6526E+04	2.5724E+00	0.000E+00	5.040E+00
2.629708E-01	2.93013E+01	1.6283E+01	1.4892E+04	2.8313E+00	0.000E+00	4.715E+00
2.811158E-01	2.98835E+01	1.5795E+01	1.3513E+04	3.1046E+00	0.000E+00	4.410E+00
3.005128E-01	3.03862E+01	1.5377E+01	1.2306E+04	3.3919E+00	0.000E+00	4.126E+00
3.212482E-01	3.07751E+01	1.5007E+01	1.1235E+04	3.6923E+00	0.000E+00	3.859E+00
3.434143E-01	3.09276E+01	1.4681E+01	1.0281E+04	4.0047E+00	0.000E+00	3.610E+00
3.521140E-01	3.07777E+01	1.4570E+01	9.9515E+03	4.1247E+00	0.000E+00	3.521E+00
3.575035E-01	3.03120E+01	1.4505E+01	9.7581E+03	4.1983E+00	0.000E+00	3.468E+00
3.589407E-01	2.96822E+01	1.4489E+01	9.7079E+03	4.2179E+00	0.000E+00	3.454E+00
3.610965E-01	3.03700E+01	1.5743E+01	1.0486E+04	4.2471E+00	0.000E+00	3.434E+00
3.664860E-01	3.10228E+01	1.5696E+01	1.0300E+04	4.3197E+00	0.000E+00	3.383E+00
3.671099E-01	3.10670E+01	1.5690E+01	1.0279E+04	4.3281E+00	0.000E+00	3.377E+00
3.924405E-01	3.20299E+01	1.5505E+01	9.5019E+03	4.6609E+00	0.000E+00	3.159E+00
4.018980E-01	3.22173E+01	1.5449E+01	9.2448E+03	4.7817E+00	0.000E+00	3.085E+00
4.080495E-01	3.22296E+01	1.5415E+01	9.0857E+03	4.8593E+00	0.000E+00	3.038E+00
4.096899E-01	3.20986E+01	1.5407E+01	9.0443E+03	4.8798E+00	0.000E+00	3.026E+00
4.121505E-01	3.23298E+01	1.5731E+01	9.1793E+03	4.9105E+00	0.000E+00	3.008E+00
4.183020E-01	3.26251E+01	1.5706E+01	9.0300E+03	4.9867E+00	0.000E+00	2.964E+00
4.195189E-01	3.26684E+01	1.5701E+01	9.0011E+03	5.0017E+00	0.000E+00	2.955E+00
4.484657E-01	3.34492E+01	1.5605E+01	8.3688E+03	5.3486E+00	0.000E+00	2.765E+00
4.794098E-01	3.40780E+01	1.5524E+01	7.7877E+03	5.6999E+00	0.000E+00	2.586E+00
4.960760E-01	3.42971E+01	1.5481E+01	7.5056E+03	5.8807E+00	0.000E+00	2.499E+00
5.036690E-01	3.42352E+01	1.5462E+01	7.3830E+03	5.9612E+00	0.000E+00	2.462E+00
5.056938E-01	3.40122E+01	1.5456E+01	7.3509E+03	5.9825E+00	0.000E+00	2.452E+00
5.087310E-01	3.43450E+01	1.5970E+01	7.5501E+03	6.0143E+00	0.000E+00	2.437E+00
5.124891E-01	3.45776E+01	1.5962E+01	7.4906E+03	6.0533E+00	0.000E+00	2.419E+00
5.163240E-01	3.47396E+01	1.5953E+01	7.4307E+03	6.0928E+00	0.000E+00	2.401E+00
5.478508E-01	3.56408E+01	1.5867E+01	6.9654E+03	6.4068E+00	0.000E+00	2.263E+00
5.856525E-01	3.65235E+01	1.5732E+01	6.4604E+03	6.7580E+00	0.000E+00	2.117E+00
6.260625E-01	3.73314E+01	1.5542E+01	5.9705E+03	7.1047E+00	0.000E+00	1.980E+00
6.692609E-01	3.81045E+01	1.5290E+01	5.4947E+03	7.4444E+00	0.000E+00	1.853E+00
7.154399E-01	3.88213E+01	1.4972E+01	5.0331E+03	7.7747E+00	0.000E+00	1.733E+00
7.648052E-01	3.94579E+01	1.4589E+01	4.5876E+03	8.0932E+00	0.000E+00	1.621E+00
8.175768E-01	3.99933E+01	1.4148E+01	4.1619E+03	8.3976E+00	0.000E+00	1.516E+00
8.739896E-01	4.04005E+01	1.3655E+01	3.7576E+03	8.6857E+00	0.000E+00	1.419E+00
9.342948E-01	4.06468E+01	1.3128E+01	3.3794E+03	8.9551E+00	0.000E+00	1.327E+00
9.987612E-01	4.07369E+01	1.2593E+01	3.0325E+03	9.2040E+00	0.000E+00	1.241E+00
1.067676E+00	4.05828E+01	1.1566E+01	2.6053E+03	9.4304E+00	0.000E+00	1.161E+00
1.141345E+00	3.96960E+01	1.0637E+01	2.2414E+03	9.6326E+00	0.000E+00	1.086E+00
1.220098E+00	3.81707E+01	9.8049E+00	1.9327E+03	9.8091E+00	0.000E+00	1.016E+00
1.304285E+00	3.56426E+01	9.0579E+00	1.6702E+03	9.9588E+00	0.000E+00	9.506E-01
1.394281E+00	3.10770E+01	8.3859E+00	1.4465E+03	1.0081E+01	0.000E+00	8.892E-01

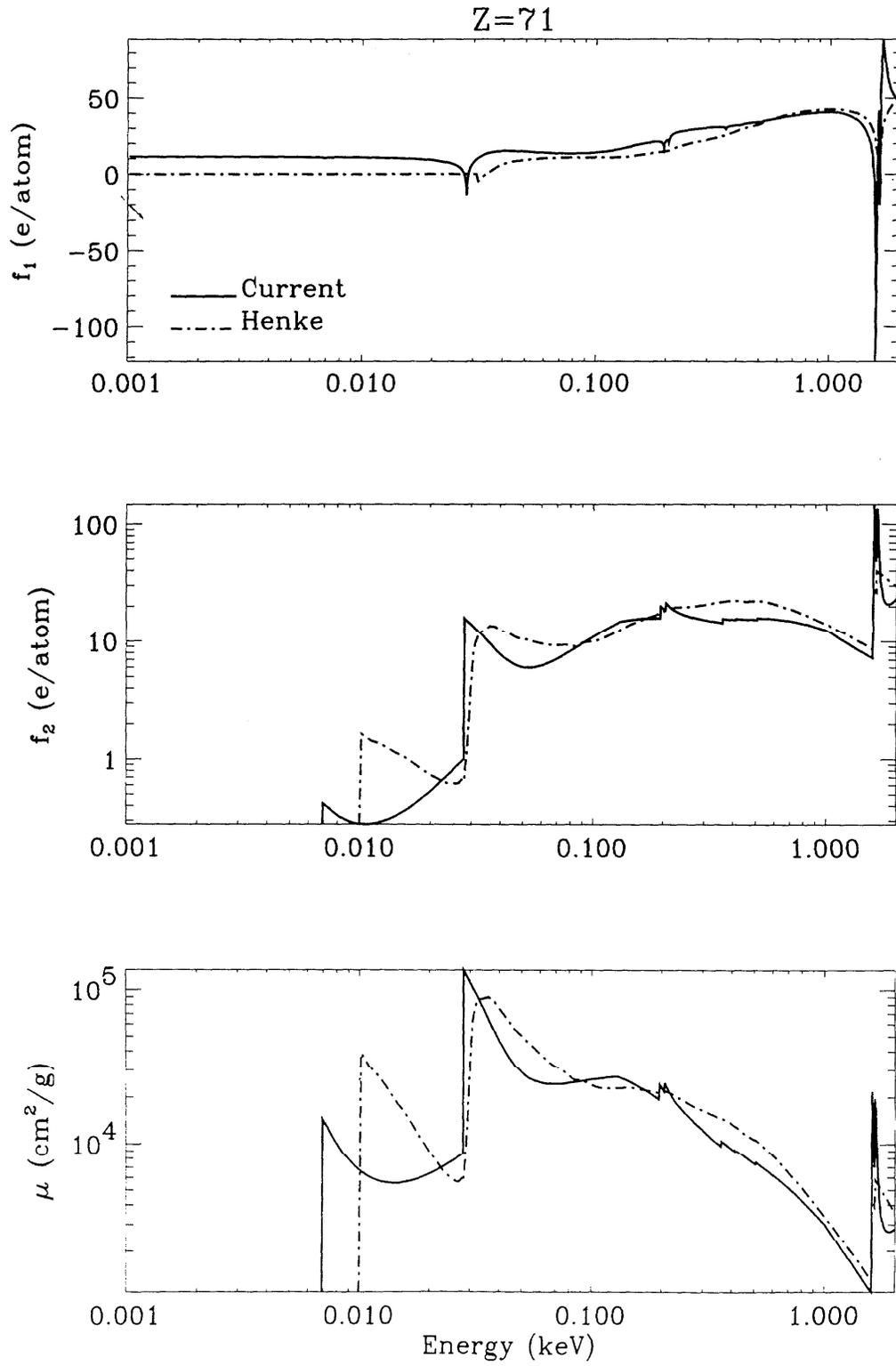
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 493

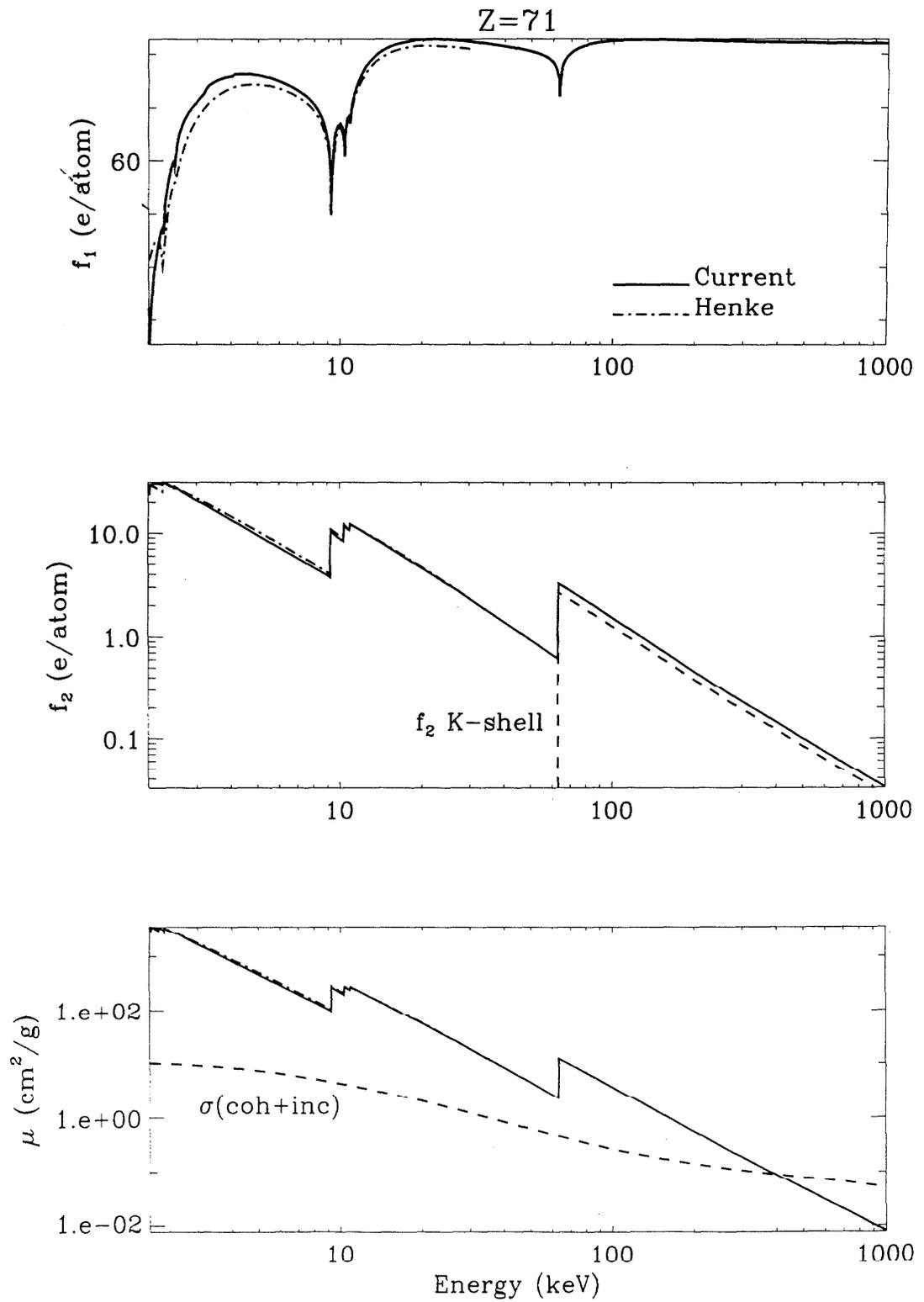
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.490486E+00	2.03091E+01	7.7684E+00	1.2535E+03	1.0174E+01	0.000E+00	8.318E-01
1.556730E+00	-5.46980E+00	7.3927E+00	1.1421E+03	1.0219E+01	0.000E+00	7.964E-01
1.580558E+00	-5.14267E+01	7.2673E+00	1.1058E+03	1.0231E+01	0.000E+00	7.844E-01
1.586912E+00	-1.22715E+02	7.2346E+00	1.0964E+03	1.0234E+01	0.000E+00	7.813E-01
1.593329E+00	-3.98014E+01	1.5891E+02	2.3987E+04	1.0237E+01	0.000E+00	7.781E-01
1.596443E+00	2.09723E+00	1.4538E+02	2.1902E+04	1.0239E+01	0.000E+00	7.766E-01
1.606612E+00	3.28397E+01	1.0916E+02	1.6341E+04	1.0243E+01	0.000E+00	7.717E-01
1.620270E+00	4.22023E+01	7.5145E+01	1.1154E+04	1.0249E+01	0.000E+00	7.652E-01
1.631203E+00	2.68115E+01	5.6381E+01	8.3128E+03	1.0253E+01	0.000E+00	7.601E-01
1.637761E+00	-2.00184E+01	4.7736E+01	7.0100E+03	1.0255E+01	0.000E+00	7.570E-01
1.647597E+00	5.55095E+01	1.2957E+02	1.8913E+04	1.0258E+01	0.000E+00	7.525E-01
1.672188E+00	8.93798E+01	6.8350E+01	9.8305E+03	1.0265E+01	0.000E+00	7.414E-01
1.703269E+00	8.18435E+01	3.6942E+01	5.2162E+03	1.0272E+01	0.000E+00	7.279E-01
1.820795E+00	5.58350E+01	2.0967E+01	2.7695E+03	1.0277E+01	0.000E+00	6.809E-01
1.946430E+00	4.85685E+01	2.2179E+01	2.7405E+03	1.0253E+01	0.000E+00	6.370E-01
1.983128E+00	4.71487E+01	2.3073E+01	2.7982E+03	1.0241E+01	0.000E+00	6.252E-01
2.013482E+00	4.50362E+01	2.3881E+01	2.8525E+03	1.0229E+01	0.000E+00	6.158E-01
2.021577E+00	4.26362E+01	2.4102E+01	2.8673E+03	1.0226E+01	0.000E+00	6.133E-01
2.033718E+00	4.51941E+01	2.9207E+01	3.4540E+03	1.0221E+01	0.000E+00	6.096E-01
2.064072E+00	4.78472E+01	2.9851E+01	3.4782E+03	1.0208E+01	0.000E+00	6.007E-01
2.080733E+00	4.87330E+01	3.0010E+01	3.4687E+03	1.0200E+01	0.000E+00	5.959E-01
2.218230E+00	5.34757E+01	3.0002E+01	3.2528E+03	1.0123E+01	0.000E+00	5.589E-01
2.224304E+00	5.35967E+01	2.9951E+01	3.2385E+03	1.0119E+01	0.000E+00	5.574E-01
2.252182E+00	5.37714E+01	2.9680E+01	3.1694E+03	1.0101E+01	0.000E+00	5.505E-01
2.261236E+00	5.30863E+01	2.9579E+01	3.1460E+03	1.0095E+01	0.000E+00	5.483E-01
2.274817E+00	5.44791E+01	3.1311E+01	3.3104E+03	1.0086E+01	0.000E+00	5.450E-01
2.308770E+00	5.63101E+01	3.0774E+01	3.2057E+03	1.0062E+01	0.000E+00	5.370E-01
2.377781E+00	5.84760E+01	2.9516E+01	2.9854E+03	1.0011E+01	0.000E+00	5.214E-01
2.441376E+00	5.97396E+01	2.8313E+01	2.7892E+03	9.9615E+00	0.000E+00	5.078E-01
2.478744E+00	5.99870E+01	2.7593E+01	2.6772E+03	9.9310E+00	0.000E+00	5.002E-01
2.488709E+00	5.95753E+01	2.7401E+01	2.6479E+03	9.9228E+00	0.000E+00	4.982E-01
2.503656E+00	6.04336E+01	2.8278E+01	2.7164E+03	9.9103E+00	0.000E+00	4.952E-01
2.541848E+00	6.15666E+01	2.7539E+01	2.6057E+03	9.8778E+00	0.000E+00	4.878E-01
2.717235E+00	6.39604E+01	2.4458E+01	2.1647E+03	9.7200E+00	0.000E+00	4.563E-01
2.904724E+00	6.51316E+01	2.1922E+01	1.8151E+03	9.5393E+00	0.000E+00	4.268E-01
3.105150E+00	6.60153E+01	1.9891E+01	1.5406E+03	9.3374E+00	0.000E+00	3.993E-01
3.319406E+00	6.70860E+01	1.7992E+01	1.3036E+03	9.1162E+00	0.000E+00	3.735E-01
3.548445E+00	6.75402E+01	1.6221E+01	1.0994E+03	8.8774E+00	0.000E+00	3.494E-01
3.793288E+00	6.78106E+01	1.4646E+01	9.2859E+02	8.6230E+00	0.000E+00	3.269E-01
4.055024E+00	6.80705E+01	1.3234E+01	7.8492E+02	8.3550E+00	0.000E+00	3.058E-01
4.334821E+00	6.81253E+01	1.1926E+01	6.6167E+02	8.0754E+00	0.000E+00	2.860E-01
4.633924E+00	6.81421E+01	1.0755E+01	5.5818E+02	7.7862E+00	0.000E+00	2.676E-01
4.953664E+00	6.80331E+01	9.6944E+00	4.7067E+02	7.4893E+00	0.000E+00	2.503E-01
5.295467E+00	6.78818E+01	8.7414E+00	3.9701E+02	7.1868E+00	0.000E+00	2.341E-01
5.660855E+00	6.76534E+01	7.8920E+00	3.3530E+02	6.8805E+00	0.000E+00	2.190E-01
6.051453E+00	6.73736E+01	7.1349E+00	2.8356E+02	6.5721E+00	0.000E+00	2.049E-01
6.469004E+00	6.70389E+01	6.4591E+00	2.4014E+02	6.2634E+00	0.000E+00	1.917E-01
6.915365E+00	6.66357E+01	5.8517E+00	2.0351E+02	5.9559E+00	0.000E+00	1.793E-01
7.392525E+00	6.61193E+01	5.2816E+00	1.7183E+02	5.6512E+00	0.000E+00	1.677E-01
7.902609E+00	6.54029E+01	4.7703E+00	1.4518E+02	5.3506E+00	0.000E+00	1.569E-01
8.447890E+00	6.42755E+01	4.3147E+00	1.2284E+02	5.0553E+00	0.000E+00	1.468E-01
9.030794E+00	6.15220E+01	3.8874E+00	1.0353E+02	4.7665E+00	0.000E+00	1.373E-01
9.059218E+00	6.12237E+01	3.8656E+00	1.0262E+02	4.7530E+00	0.000E+00	1.369E-01
9.197879E+00	5.83103E+01	3.7620E+00	9.8368E+01	4.6884E+00	0.000E+00	1.348E-01
9.234856E+00	5.48774E+01	3.7351E+00	9.7275E+01	4.6713E+00	0.000E+00	1.343E-01
9.290320E+00	5.83353E+01	1.0408E+01	2.6944E+02	4.6460E+00	0.000E+00	1.335E-01
9.428982E+00	6.13582E+01	1.0061E+01	2.5662E+02	4.5836E+00	0.000E+00	1.315E-01
9.653919E+00	6.28874E+01	9.5328E+00	2.3749E+02	4.4851E+00	0.000E+00	1.284E-01
1.014163E+01	6.32255E+01	8.6510E+00	2.0515E+02	4.2825E+00	0.000E+00	1.223E-01
1.029686E+01	6.20344E+01	8.4114E+00	1.9646E+02	4.2210E+00	0.000E+00	1.204E-01
1.032004E+01	6.14352E+01	8.3769E+00	1.9522E+02	4.2120E+00	0.000E+00	1.201E-01
1.033825E+01	6.03722E+01	8.3500E+00	1.9425E+02	4.2049E+00	0.000E+00	1.199E-01
1.040034E+01	6.21758E+01	1.1623E+01	2.6878E+02	4.1808E+00	0.000E+00	1.192E-01
1.055557E+01	6.38087E+01	1.1291E+01	2.5725E+02	4.1216E+00	0.000E+00	1.175E-01
1.065299E+01	6.42064E+01	1.1091E+01	2.5039E+02	4.0851E+00	0.000E+00	1.164E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.081605E+01	6.41778E+01	1.0771E+01	2.3950E+02	4.0252E+00	0.000E+00	1.146E-01
1.085953E+01	6.34651E+01	1.0689E+01	2.3672E+02	4.0094E+00	0.000E+00	1.142E-01
1.092475E+01	6.45250E+01	1.2266E+01	2.7003E+02	3.9860E+00	0.000E+00	1.135E-01
1.103212E+01	6.54276E+01	1.2075E+01	2.6325E+02	3.9478E+00	0.000E+00	1.124E-01
1.108781E+01	6.57342E+01	1.1979E+01	2.5984E+02	3.9283E+00	0.000E+00	1.118E-01
1.179234E+01	6.78323E+01	1.0890E+01	2.2209E+02	3.6933E+00	0.000E+00	1.051E-01
1.260708E+01	6.90599E+01	9.8194E+00	1.8732E+02	3.4489E+00	0.000E+00	9.834E-02
1.347697E+01	6.98582E+01	8.8462E+00	1.5787E+02	3.2150E+00	0.000E+00	9.200E-02
1.440688E+01	7.04053E+01	7.9399E+00	1.3255E+02	2.9917E+00	0.000E+00	8.606E-02
1.540095E+01	7.07705E+01	7.1159E+00	1.1112E+02	2.7793E+00	0.000E+00	8.050E-02
1.646362E+01	7.10101E+01	6.3749E+00	9.3125E+01	2.5779E+00	0.000E+00	7.531E-02
1.759961E+01	7.11611E+01	5.7119E+00	7.8055E+01	2.3874E+00	0.000E+00	7.045E-02
1.881398E+01	7.13132E+01	5.1183E+00	6.5429E+01	2.2078E+00	0.000E+00	6.590E-02
2.011215E+01	7.13517E+01	4.5831E+00	5.4805E+01	2.0388E+00	0.000E+00	6.165E-02
2.149988E+01	7.13908E+01	4.1049E+00	4.5919E+01	1.8803E+00	0.000E+00	5.767E-02
2.298338E+01	7.13990E+01	3.6721E+00	3.8426E+01	1.7320E+00	0.000E+00	5.395E-02
2.456923E+01	7.13572E+01	3.2866E+00	3.2172E+01	1.5936E+00	0.000E+00	5.046E-02
2.626450E+01	7.13068E+01	2.9442E+00	2.6960E+01	1.4647E+00	0.000E+00	4.721E-02
2.807676E+01	7.12484E+01	2.6182E+00	2.2427E+01	1.3450E+00	0.000E+00	4.416E-02
3.001405E+01	7.11650E+01	2.3240E+00	1.8622E+01	1.2341E+00	0.000E+00	4.131E-02
3.208502E+01	7.10701E+01	2.0646E+00	1.5476E+01	1.1315E+00	0.000E+00	3.864E-02
3.429889E+01	7.09678E+01	1.8357E+00	1.2872E+01	1.0369E+00	0.000E+00	3.615E-02
3.666551E+01	7.08598E+01	1.6333E+00	1.0714E+01	9.4974E-01	0.000E+00	3.381E-02
3.919543E+01	7.07462E+01	1.4545E+00	8.9249E+00	8.6966E-01	0.000E+00	3.163E-02
4.18992E+01	7.06252E+01	1.2942E+00	7.4285E+00	7.9622E-01	0.000E+00	2.959E-02
4.479101E+01	7.04918E+01	1.1513E+00	6.1818E+00	7.2899E-01	0.000E+00	2.768E-02
4.788159E+01	7.03391E+01	1.0224E+00	5.1354E+00	6.6756E-01	0.000E+00	2.589E-02
5.118542E+01	7.01506E+01	9.0531E-01	4.2538E+00	6.1151E-01	0.000E+00	2.422E-02
5.471721E+01	6.98941E+01	8.0196E-01	3.5250E+00	5.6047E-01	0.000E+00	2.266E-02
5.849270E+01	6.94707E+01	7.1065E-01	2.9220E+00	5.1405E-01	0.000E+00	2.120E-02
6.204752E+01	6.84517E+01	6.3901E-01	2.4769E+00	4.7657E-01	0.000E+00	1.998E-02
6.252870E+01	6.80708E+01	6.3021E-01	2.4240E+00	4.7190E-01	0.000E+00	1.983E-02
6.299723E+01	6.73303E+01	6.2183E-01	2.3739E+00	4.6743E-01	0.000E+00	1.968E-02
6.325049E+01	6.59876E+01	6.1737E-01	2.3475E+00	4.6505E-01	0.000E+00	1.960E-02
6.363037E+01	6.73441E+01	3.2538E+00	1.2298E+01	4.6153E-01	9.990E+00	1.949E-02
6.458008E+01	6.85694E+01	3.1814E+00	1.1848E+01	4.5293E-01	9.633E+00	1.920E-02
6.684318E+01	6.95080E+01	3.0182E+00	1.0860E+01	4.3367E-01	8.847E+00	1.855E-02
7.145536E+01	7.02671E+01	2.7105E+00	9.1230E+00	3.9903E-01	7.451E+00	1.735E-02
7.638578E+01	7.06580E+01	2.4307E+00	7.6531E+00	3.6769E-01	6.263E+00	1.623E-02
8.165640E+01	7.09032E+01	2.1793E+00	6.4189E+00	3.3935E-01	5.266E+00	1.518E-02
8.729069E+01	7.10647E+01	1.9462E+00	5.3623E+00	3.1374E-01	4.410E+00	1.420E-02
9.331374E+01	7.11701E+01	1.7376E+00	4.4784E+00	2.9051E-01	3.692E+00	1.329E-02
9.975239E+01	7.12395E+01	1.5515E+00	3.7407E+00	2.6973E-01	3.091E+00	1.243E-02
1.066353E+02	7.12841E+01	1.3855E+00	3.1249E+00	2.5088E-01	2.588E+00	1.163E-02
1.139931E+02	7.13112E+01	1.2375E+00	2.6108E+00	2.3387E-01	2.166E+00	1.088E-02
1.218587E+02	7.13261E+01	1.1054E+00	2.1816E+00	2.1850E-01	1.813E+00	1.017E-02
1.302669E+02	7.13602E+01	9.8577E-01	1.8200E+00	2.0461E-01	1.515E+00	9.518E-03
1.392553E+02	7.13570E+01	8.7710E-01	1.5148E+00	1.9204E-01	1.262E+00	8.903E-03
1.488640E+02	7.13479E+01	7.8049E-01	1.2610E+00	1.8066E-01	1.051E+00	8.329E-03
1.591356E+02	7.13349E+01	6.9458E-01	1.0497E+00	1.7034E-01	8.756E-01	7.791E-03
1.701159E+02	7.13193E+01	6.1819E-01	8.7398E-01	1.6095E-01	7.294E-01	7.288E-03
1.818539E+02	7.13022E+01	5.5025E-01	7.2772E-01	1.5240E-01	6.076E-01	6.818E-03
1.944018E+02	7.12843E+01	4.8983E-01	6.0599E-01	1.4459E-01	5.061E-01	6.378E-03
2.078156E+02	7.12660E+01	4.3607E-01	5.0466E-01	1.3744E-01	4.216E-01	5.966E-03
2.221548E+02	7.12477E+01	3.8875E-01	4.2037E-01	1.3087E-01	3.512E-01	5.581E-03
2.374835E+02	7.12297E+01	3.4570E-01	3.5009E-01	1.2481E-01	2.925E-01	5.221E-03
2.538699E+02	7.12122E+01	3.0783E-01	2.9163E-01	1.1920E-01	2.437E-01	4.884E-03
2.713869E+02	7.11950E+01	2.7414E-01	2.4294E-01	1.1399E-01	2.030E-01	4.569E-03
2.901126E+02	7.11787E+01	2.4552E-01	2.0354E-01	1.0914E-01	1.702E-01	4.274E-03
3.101304E+02	7.11639E+01	2.2016E-01	1.7073E-01	1.0459E-01	1.429E-01	3.998E-03
3.315294E+02	7.11504E+01	1.9742E-01	1.4322E-01	1.0032E-01	1.200E-01	3.740E-03
3.544049E+02	7.11379E+01	1.7705E-01	1.2015E-01	9.6283E-02	1.008E-01	3.498E-03
3.788588E+02	7.11263E+01	1.5879E-01	1.0080E-01	9.2463E-02	8.463E-02	3.273E-03
4.050001E+02	7.11157E+01	1.4242E-01	8.4576E-02	8.8832E-02	7.106E-02	3.061E-03
4.329451E+02	7.11058E+01	1.2775E-01	7.0966E-02	8.5369E-02	5.967E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 497

Hf Z = 72

Atomic weight = 1.784900E+02 g/mol, nominal density ρ (g/cm³) = 1.3290E+01

μ_0 (barns/atom) = μ (cm²/g) \times 2.96390E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.35757E+05

10 edges. Edge energies (keV):

K		6.53508E+00	L	I	1.12707E+00	L	II	1.07394E+00	L	III	9.56070E+00
M	I	2.60090E+00	M	II	2.36540E+00	M	III	2.10760E+00	M	IV	1.71640E+00
N	V	1.66170E+00	N	I	5.38100E-00	N	II	4.37000E-00	N	III	3.80400E-01
O	IV	2.23800E-00	O	V	2.13700E-00	O	I	1.71000E-02	O	II	1.71000E-02
	III	6.49000E-02		VI	3.81000E-02		VII	3.06000E-02		IV	5.00000E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.3514E+00, -8.0280E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.5933E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
4.90000E-03	8.07421E+00	0.0000E+00	0.0000E+00	5.1658E-06	0.000E+00	2.530E+02
4.97500E-03	7.62222E+00	0.0000E+00	0.0000E+00	5.6145E-06	0.000E+00	2.492E+02
4.99500E-03	7.09825E+00	0.0000E+00	0.0000E+00	5.7391E-06	0.000E+00	2.482E+02
5.02500E-03	7.62497E+00	1.0218E+00	4.7938E+04	5.9300E-06	0.000E+00	2.467E+02
5.10000E-03	8.07584E+00	1.0141E+00	4.6879E+04	6.4289E-06	0.000E+00	2.431E+02
1.06900E-02	8.92457E+00	1.9327E+00	4.2624E+04	2.6051E-04	0.000E+00	1.160E+02
1.142761E-02	9.03059E+00	2.0717E+00	4.2740E+04	3.5247E-04	0.000E+00	1.085E+02
1.221612E-02	9.15381E+00	2.1926E+00	4.2314E+04	4.7450E-04	0.000E+00	1.015E+02
1.305903E-02	9.28691E+00	2.2883E+00	4.1310E+04	6.3555E-04	0.000E+00	9.494E+01
1.396010E-02	9.41862E+00	2.3530E+00	3.9738E+04	8.4702E-04	0.000E+00	8.881E+01
1.492335E-02	9.53125E+00	2.3829E+00	3.7645E+04	1.1232E-03	0.000E+00	8.308E+01
1.595306E-02	9.60064E+00	2.3763E+00	3.5117E+04	1.4822E-03	0.000E+00	7.772E+01
1.675800E-02	9.50328E+00	2.3483E+00	3.3036E+04	1.8129E-03	0.000E+00	7.399E+01
1.701450E-02	9.28984E+00	2.3358E+00	3.2365E+04	1.9281E-03	0.000E+00	7.287E+01
1.705382E-02	9.18348E+00	2.3338E+00	3.2263E+04	1.9462E-03	0.000E+00	7.270E+01
1.708290E-02	9.00587E+00	2.3322E+00	3.2186E+04	1.9596E-03	0.000E+00	7.258E+01
1.718550E-02	9.32500E+00	2.9002E+00	3.9787E+04	2.0076E-03	0.000E+00	7.214E+01
1.744200E-02	9.61790E+00	2.8639E+00	3.8711E+04	2.1311E-03	0.000E+00	7.108E+01
1.823053E-02	9.90396E+00	2.7511E+00	3.5577E+04	2.5430E-03	0.000E+00	6.801E+01
1.948844E-02	1.00524E+01	2.5735E+00	3.1132E+04	3.3067E-03	0.000E+00	6.362E+01
2.083314E-02	1.00556E+01	2.4055E+00	2.7222E+04	4.2791E-03	0.000E+00	5.951E+01
2.27063E-02	9.94564E+00	2.2437E+00	2.3752E+04	5.5108E-03	0.000E+00	5.567E+01
2.380730E-02	9.70585E+00	2.0894E+00	2.0691E+04	7.0633E-03	0.000E+00	5.208E+01
2.545001E-02	9.28520E+00	1.9469E+00	1.8035E+04	9.0102E-03	0.000E+00	4.872E+01
2.720606E-02	8.54989E+00	1.8213E+00	1.5782E+04	1.1440E-02	0.000E+00	4.557E+01
2.908327E-02	6.97692E+00	1.7179E+00	1.3926E+04	1.4456E-02	0.000E+00	4.263E+01
2.998800E-02	5.07695E+00	1.6794E+00	1.3203E+04	1.6071E-02	0.000E+00	4.134E+01
3.044700E-02	4.70160E+00	1.6625E+00	1.2873E+04	1.6931E-02	0.000E+00	4.072E+01
3.056940E-02	-1.66293E+00	1.6584E+00	1.2790E+04	1.7165E-02	0.000E+00	4.056E+01
3.075300E-02	2.20774E+00	8.8980E+00	6.8213E+04	1.7520E-02	0.000E+00	4.032E+01
3.109002E-02	5.03434E+00	8.7271E+00	6.6178E+04	1.8183E-02	0.000E+00	3.988E+01
3.121200E-02	5.58090E+00	8.6669E+00	6.5464E+04	1.8427E-02	0.000E+00	3.972E+01
3.323523E-02	9.04873E+00	7.7757E+00	5.5158E+04	2.2766E-02	0.000E+00	3.731E+01
3.552846E-02	1.00316E+01	6.9188E+00	4.5911E+04	2.8372E-02	0.000E+00	3.490E+01
3.733800E-02	9.46532E+00	6.2957E+00	3.9752E+04	3.3326E-02	0.000E+00	3.321E+01
3.790950E-02	8.11001E+00	6.1146E+00	3.8026E+04	3.4989E-02	0.000E+00	3.271E+01
3.797993E-02	7.61463E+00	6.0929E+00	3.7821E+04	3.5198E-02	0.000E+00	3.264E+01
3.806190E-02	6.34795E+00	6.0677E+00	3.7584E+04	3.5441E-02	0.000E+00	3.257E+01
3.829050E-02	8.26411E+00	9.5352E+00	5.8709E+04	3.6125E-02	0.000E+00	3.238E+01
3.886700E-02	1.00071E+01	9.3044E+00	5.6445E+04	3.7868E-02	0.000E+00	3.190E+01
4.060054E-02	1.16878E+01	8.6704E+00	5.0347E+04	4.3468E-02	0.000E+00	3.054E+01
4.340198E-02	1.27823E+01	7.8368E+00	4.2569E+04	5.3439E-02	0.000E+00	2.857E+01
4.639671E-02	1.32949E+01	7.0954E+00	3.6054E+04	6.5403E-02	0.000E+00	2.672E+01
4.959809E-02	1.34529E+01	6.4926E+00	3.0862E+04	7.9691E-02	0.000E+00	2.500E+01
5.302035E-02	1.33571E+01	6.0680E+00	2.6982E+04	9.6671E-02	0.000E+00	2.338E+01
5.667876E-02	1.31397E+01	5.8379E+00	2.4283E+04	1.1675E-01	0.000E+00	2.187E+01
6.058959E-02	1.28444E+01	5.8027E+00	2.2579E+04	1.4040E-01	0.000E+00	2.046E+01
6.360200E-02	1.26033E+01	5.8945E+00	2.1849E+04	1.6011E-01	0.000E+00	1.949E+01
6.457550E-02	1.25128E+01	5.9426E+00	2.1696E+04	1.6675E-01	0.000E+00	1.920E+01
6.477028E-02	1.24850E+01	5.9533E+00	2.1669E+04	1.6809E-01	0.000E+00	1.914E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.483510E-02	1.24699E+01	5.9569E+00	2.1661E+04	1.6854E-01	0.000E+00	1.912E+01
6.522450E-02	1.24674E+01	6.0278E+00	2.1788E+04	1.7125E-01	0.000E+00	1.901E+01
6.619800E-02	1.24235E+01	6.0902E+00	2.1690E+04	1.7811E-01	0.000E+00	1.873E+01
6.923942E-02	1.22607E+01	6.3289E+00	2.1550E+04	2.0039E-01	0.000E+00	1.791E+01
7.401695E-02	1.20617E+01	6.7968E+00	2.1649E+04	2.3787E-01	0.000E+00	1.675E+01
7.912411E-02	1.19422E+01	7.3742E+00	2.1972E+04	2.8117E-01	0.000E+00	1.567E+01
8.458368E-02	1.19154E+01	8.0377E+00	2.2403E+04	3.3095E-01	0.000E+00	1.466E+01
9.041995E-02	1.19887E+01	8.7649E+00	2.2853E+04	3.8791E-01	0.000E+00	1.371E+01
9.665893E-02	1.21710E+01	9.5362E+00	2.3259E+04	4.5278E-01	0.000E+00	1.283E+01
1.033284E-01	1.24501E+01	1.0333E+01	2.3576E+04	5.2633E-01	0.000E+00	1.200E+01
1.104581E-01	1.28278E+01	1.1136E+01	2.3768E+04	6.0932E-01	0.000E+00	1.122E+01
1.180797E-01	1.32971E+01	1.1931E+01	2.3822E+04	7.0252E-01	0.000E+00	1.050E+01
1.262272E-01	1.38486E+01	1.2706E+01	2.3732E+04	8.0672E-01	0.000E+00	9.822E+00
1.349368E-01	1.44715E+01	1.3452E+01	2.3504E+04	9.2265E-01	0.000E+00	9.188E+00
1.442475E-01	1.51533E+01	1.4162E+01	2.3147E+04	1.0510E+00	0.000E+00	8.595E+00
1.542005E-01	1.58793E+01	1.4832E+01	2.2676E+04	1.1926E+00	0.000E+00	8.040E+00
1.648404E-01	1.66312E+01	1.5458E+01	2.2109E+04	1.3479E+00	0.000E+00	7.521E+00
1.762144E-01	1.73823E+01	1.6042E+01	2.1462E+04	1.5175E+00	0.000E+00	7.036E+00
1.883732E-01	1.80812E+01	1.6584E+01	2.0755E+04	1.7018E+00	0.000E+00	6.582E+00
2.013709E-01	1.85700E+01	1.7086E+01	2.0004E+04	1.9012E+00	0.000E+00	6.157E+00
2.094260E-01	1.83866E+01	1.7365E+01	1.9548E+04	2.0255E+00	0.000E+00	5.920E+00
2.126315E-01	1.75818E+01	1.7470E+01	1.9370E+04	2.0751E+00	0.000E+00	5.831E+00
2.134863E-01	1.64223E+01	1.7497E+01	1.9323E+04	2.0884E+00	0.000E+00	5.808E+00
2.147685E-01	1.78002E+01	1.9910E+01	2.1856E+04	2.1082E+00	0.000E+00	5.773E+00
2.152655E-01	1.81313E+01	1.9898E+01	2.1792E+04	2.1159E+00	0.000E+00	5.760E+00
2.179740E-01	1.90228E+01	1.9840E+01	2.1459E+04	2.1578E+00	0.000E+00	5.688E+00
2.193240E-01	1.92392E+01	1.9814E+01	2.1299E+04	2.1787E+00	0.000E+00	5.653E+00
2.226810E-01	1.92015E+01	1.9758E+01	2.0918E+04	2.2307E+00	0.000E+00	5.568E+00
2.235762E-01	1.84909E+01	1.9744E+01	2.0820E+04	2.2446E+00	0.000E+00	5.546E+00
2.249190E-01	1.96490E+01	2.1424E+01	2.2456E+04	2.2654E+00	0.000E+00	5.512E+00
2.282760E-01	2.09258E+01	2.1257E+01	2.1954E+04	2.3174E+00	0.000E+00	5.431E+00
2.301188E-01	2.13490E+01	2.1175E+01	2.1694E+04	2.3459E+00	0.000E+00	5.388E+00
2.459970E-01	2.33999E+01	2.0708E+01	1.9846E+04	2.5913E+00	0.000E+00	5.040E+00
2.629708E-01	2.46971E+01	2.0657E+01	1.8519E+04	2.8516E+00	0.000E+00	4.715E+00
2.811158E-01	2.59238E+01	2.0872E+01	1.7504E+04	3.1266E+00	0.000E+00	4.410E+00
3.005128E-01	2.72944E+01	2.1096E+01	1.6550E+04	3.4155E+00	0.000E+00	4.126E+00
3.212482E-01	2.87745E+01	2.1217E+01	1.5571E+04	3.7176E+00	0.000E+00	3.859E+00
3.434143E-01	3.01088E+01	2.0505E+01	1.4077E+04	4.0318E+00	0.000E+00	3.610E+00
3.671099E-01	3.09425E+01	1.9809E+01	1.2722E+04	4.3570E+00	0.000E+00	3.377E+00
3.727920E-01	3.09653E+01	1.9652E+01	1.2428E+04	4.4332E+00	0.000E+00	3.326E+00
3.784980E-01	3.06218E+01	1.9499E+01	1.2145E+04	4.5092E+00	0.000E+00	3.276E+00
3.800196E-01	3.00022E+01	1.9458E+01	1.2072E+04	4.5293E+00	0.000E+00	3.263E+00
3.823020E-01	3.07720E+01	2.0730E+01	1.2784E+04	4.5594E+00	0.000E+00	3.243E+00
3.880080E-01	3.15793E+01	2.0594E+01	1.2513E+04	4.6341E+00	0.000E+00	3.195E+00
3.924405E-01	3.19391E+01	2.0490E+01	1.2310E+04	4.6917E+00	0.000E+00	3.159E+00
4.195189E-01	3.33063E+01	1.9904E+01	1.1185E+04	5.0345E+00	0.000E+00	2.955E+00
4.282600E-01	3.35949E+01	1.9730E+01	1.0861E+04	5.1418E+00	0.000E+00	2.895E+00
4.348150E-01	3.36968E+01	1.9604E+01	1.0629E+04	5.2211E+00	0.000E+00	2.851E+00
4.365630E-01	3.35866E+01	1.9570E+01	1.0569E+04	5.2421E+00	0.000E+00	2.840E+00
4.391850E-01	3.38555E+01	1.9864E+01	1.0663E+04	5.2735E+00	0.000E+00	2.823E+00
4.457400E-01	3.42364E+01	1.9748E+01	1.0445E+04	5.3514E+00	0.000E+00	2.782E+00
4.484657E-01	3.43589E+01	1.9701E+01	1.0357E+04	5.3835E+00	0.000E+00	2.765E+00
4.794098E-01	3.54489E+01	1.9200E+01	9.4417E+03	5.7367E+00	0.000E+00	2.586E+00
5.124891E-01	3.63161E+01	1.8717E+01	8.6103E+03	6.0923E+00	0.000E+00	2.419E+00
5.273380E-01	3.65765E+01	1.8513E+01	8.2766E+03	6.2447E+00	0.000E+00	2.351E+00
5.354095E-01	3.65545E+01	1.8404E+01	8.1040E+03	6.3256E+00	0.000E+00	2.316E+00
5.375619E-01	3.63397E+01	1.8376E+01	8.0590E+03	6.3470E+00	0.000E+00	2.306E+00
5.407905E-01	3.66904E+01	1.8860E+01	8.2219E+03	6.3789E+00	0.000E+00	2.293E+00
5.478508E-01	3.70817E+01	1.8769E+01	8.0770E+03	6.4479E+00	0.000E+00	2.263E+00
5.488620E-01	3.71231E+01	1.8756E+01	8.0566E+03	6.4578E+00	0.000E+00	2.259E+00
5.856525E-01	3.82272E+01	1.8297E+01	7.3654E+03	6.8014E+00	0.000E+00	2.117E+00
6.260625E-01	3.91669E+01	1.7803E+01	6.7040E+03	7.1503E+00	0.000E+00	1.980E+00
6.692609E-01	4.00051E+01	1.7279E+01	6.0867E+03	7.4922E+00	0.000E+00	1.853E+00
7.154399E-01	4.07725E+01	1.6721E+01	5.5100E+03	7.8248E+00	0.000E+00	1.733E+00
7.648052E-01	4.14656E+01	1.6126E+01	4.9710E+03	8.1457E+00	0.000E+00	1.621E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 499

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
8.175768E-01	4.20678E+01	1.5498E+01	4.4689E+03	8.4524E+00	0.000E+00	1.516E+00
8.739896E-01	4.25808E+01	1.4845E+01	4.0043E+03	8.7426E+00	0.000E+00	1.419E+00
9.342948E-01	4.30313E+01	1.4171E+01	3.5758E+03	9.0143E+00	0.000E+00	1.327E+00
9.987612E-01	4.36052E+01	1.3495E+01	3.1855E+03	9.2654E+00	0.000E+00	1.241E+00
1.067676E+00	4.32914E+01	1.2380E+01	2.7336E+03	9.4940E+00	0.000E+00	1.161E+00
1.141345E+00	4.25770E+01	1.1375E+01	2.3497E+03	9.6983E+00	0.000E+00	1.086E+00
1.220098E+00	4.14099E+01	1.0477E+01	2.0245E+03	9.8769E+00	0.000E+00	1.016E+00
1.304285E+00	3.95785E+01	9.6706E+00	1.7480E+03	1.0028E+01	0.000E+00	9.506E-01
1.394281E+00	3.65811E+01	8.9457E+00	1.5126E+03	1.0152E+01	0.000E+00	8.892E-01
1.490486E+00	3.09369E+01	8.2930E+00	1.3117E+03	1.0247E+01	0.000E+00	8.318E-01
1.593329E+00	1.50000E+01	7.6899E+00	1.1378E+03	1.0312E+01	0.000E+00	7.781E-01
1.628466E+00	-2.08666E+00	7.5037E+00	1.0863E+03	1.0327E+01	0.000E+00	7.614E-01
1.653392E+00	-4.64652E+01	7.3776E+00	1.0520E+03	1.0336E+01	0.000E+00	7.499E-01
1.660038E+00	-1.15388E+02	7.3448E+00	1.0431E+03	1.0338E+01	0.000E+00	7.469E-01
1.670009E+00	-5.47947E+00	1.4109E+02	1.9918E+04	1.0341E+01	0.000E+00	7.424E-01
1.682072E+00	3.79306E+01	1.0230E+02	1.4338E+04	1.0344E+01	0.000E+00	7.371E-01
1.694934E+00	4.54581E+01	7.3379E+01	1.0207E+04	1.0347E+01	0.000E+00	7.315E-01
1.703269E+00	3.88735E+01	5.9582E+01	8.2470E+03	1.0348E+01	0.000E+00	7.279E-01
1.707818E+00	2.99126E+01	5.3322E+01	7.3609E+03	1.0349E+01	0.000E+00	7.260E-01
1.714684E+00	-1.42683E+01	4.5275E+01	6.2250E+03	1.0350E+01	0.000E+00	7.231E-01
1.724982E+00	5.60012E+01	1.2230E+02	1.6715E+04	1.0352E+01	0.000E+00	7.188E-01
1.750728E+00	8.78383E+01	6.5809E+01	8.8620E+03	1.0354E+01	0.000E+00	7.082E-01
1.820795E+00	6.87813E+01	2.5192E+01	3.2619E+03	1.0354E+01	0.000E+00	6.809E-01
1.946430E+00	5.38675E+01	2.0985E+01	2.5418E+03	1.0331E+01	0.000E+00	6.370E-01
2.065448E+00	4.86944E+01	2.2898E+01	2.6136E+03	1.0287E+01	0.000E+00	6.003E-01
2.080733E+00	4.79586E+01	2.3257E+01	2.6351E+03	1.0280E+01	0.000E+00	5.959E-01
2.097062E+00	4.65724E+01	2.3651E+01	2.6590E+03	1.0272E+01	0.000E+00	5.912E-01
2.105492E+00	4.41967E+01	2.3858E+01	2.6714E+03	1.0267E+01	0.000E+00	5.889E-01
2.118138E+00	4.66819E+01	2.8871E+01	3.2134E+03	1.0261E+01	0.000E+00	5.853E-01
2.149752E+00	4.92237E+01	2.9497E+01	3.2349E+03	1.0244E+01	0.000E+00	5.767E-01
2.224304E+00	5.23336E+01	3.0114E+01	3.1919E+03	1.0200E+01	0.000E+00	5.574E-01
2.318092E+00	5.50735E+01	2.9664E+01	3.0169E+03	1.0136E+01	0.000E+00	5.349E-01
2.353573E+00	5.53517E+01	2.9292E+01	2.9342E+03	1.0111E+01	0.000E+00	5.268E-01
2.363035E+00	5.46722E+01	2.9179E+01	2.9111E+03	1.0104E+01	0.000E+00	5.247E-01
2.377781E+00	5.60746E+01	3.0856E+01	3.0593E+03	1.0092E+01	0.000E+00	5.214E-01
2.412708E+00	5.78045E+01	3.0296E+01	2.9604E+03	1.0066E+01	0.000E+00	5.139E-01
2.541848E+00	6.09078E+01	2.7955E+01	2.5928E+03	9.9595E+00	0.000E+00	4.878E-01
2.548882E+00	6.10016E+01	2.7825E+01	2.5736E+03	9.9534E+00	0.000E+00	4.864E-01
2.587895E+00	6.12062E+01	2.7107E+01	2.4694E+03	9.9194E+00	0.000E+00	4.791E-01
2.598299E+00	6.07877E+01	2.6917E+01	2.4423E+03	9.9102E+00	0.000E+00	4.772E-01
2.613904E+00	6.16220E+01	2.7787E+01	2.5062E+03	9.8963E+00	0.000E+00	4.743E-01
2.652918E+00	6.26889E+01	2.7079E+01	2.4065E+03	9.8612E+00	0.000E+00	4.674E-01
2.717235E+00	6.37299E+01	2.5965E+01	2.2528E+03	9.8019E+00	0.000E+00	4.563E-01
2.904724E+00	6.54421E+01	2.3196E+01	1.8827E+03	9.6212E+00	0.000E+00	4.268E-01
3.105150E+00	6.65998E+01	2.1000E+01	1.5944E+03	9.4191E+00	0.000E+00	3.993E-01
3.319406E+00	6.74262E+01	1.9064E+01	1.3540E+03	9.1975E+00	0.000E+00	3.735E-01
3.548445E+00	6.83684E+01	1.7200E+01	1.1428E+03	8.9581E+00	0.000E+00	3.494E-01
3.793288E+00	6.87254E+01	1.5517E+01	9.6438E+02	8.7029E+00	0.000E+00	3.269E-01
4.055024E+00	6.89327E+01	1.4024E+01	8.1535E+02	8.4339E+00	0.000E+00	3.058E-01
4.334821E+00	6.91536E+01	1.2659E+01	6.8851E+02	8.1532E+00	0.000E+00	2.860E-01
4.633924E+00	6.91625E+01	1.1413E+01	5.8067E+02	7.8627E+00	0.000E+00	2.676E-01
4.953664E+00	6.91439E+01	1.0286E+01	4.8956E+02	7.5643E+00	0.000E+00	2.503E-01
5.295467E+00	6.90244E+01	9.2735E+00	4.1286E+02	7.2602E+00	0.000E+00	2.341E-01
5.660855E+00	6.88248E+01	8.3649E+00	3.4837E+02	6.9520E+00	0.000E+00	2.190E-01
6.051453E+00	6.85712E+01	7.5559E+00	2.9437E+02	6.6417E+00	0.000E+00	2.049E-01
6.469004E+00	6.82652E+01	6.8346E+00	2.4908E+02	6.3310E+00	0.000E+00	1.917E-01
6.915365E+00	6.78987E+01	6.1907E+00	2.1105E+02	6.0213E+00	0.000E+00	1.793E-01
7.392525E+00	6.74502E+01	5.6052E+00	1.7876E+02	5.7144E+00	0.000E+00	1.677E-01
7.902609E+00	6.68549E+01	5.0609E+00	1.5098E+02	5.4115E+00	0.000E+00	1.569E-01
8.447890E+00	6.59896E+01	4.5757E+00	1.2769E+02	5.1138E+00	0.000E+00	1.468E-01
9.030794E+00	6.44545E+01	4.1277E+00	1.0776E+02	4.8226E+00	0.000E+00	1.373E-01
9.369486E+00	6.23361E+01	3.8676E+00	9.7317E+01	4.6650E+00	0.000E+00	1.323E-01
9.512897E+00	5.94352E+01	3.7646E+00	9.3298E+01	4.6007E+00	0.000E+00	1.303E-01
9.551140E+00	5.60210E+01	3.7379E+00	9.2265E+01	4.5838E+00	0.000E+00	1.298E-01
9.608504E+00	5.94578E+01	1.0373E+01	2.5452E+02	4.5586E+00	0.000E+00	1.290E-01

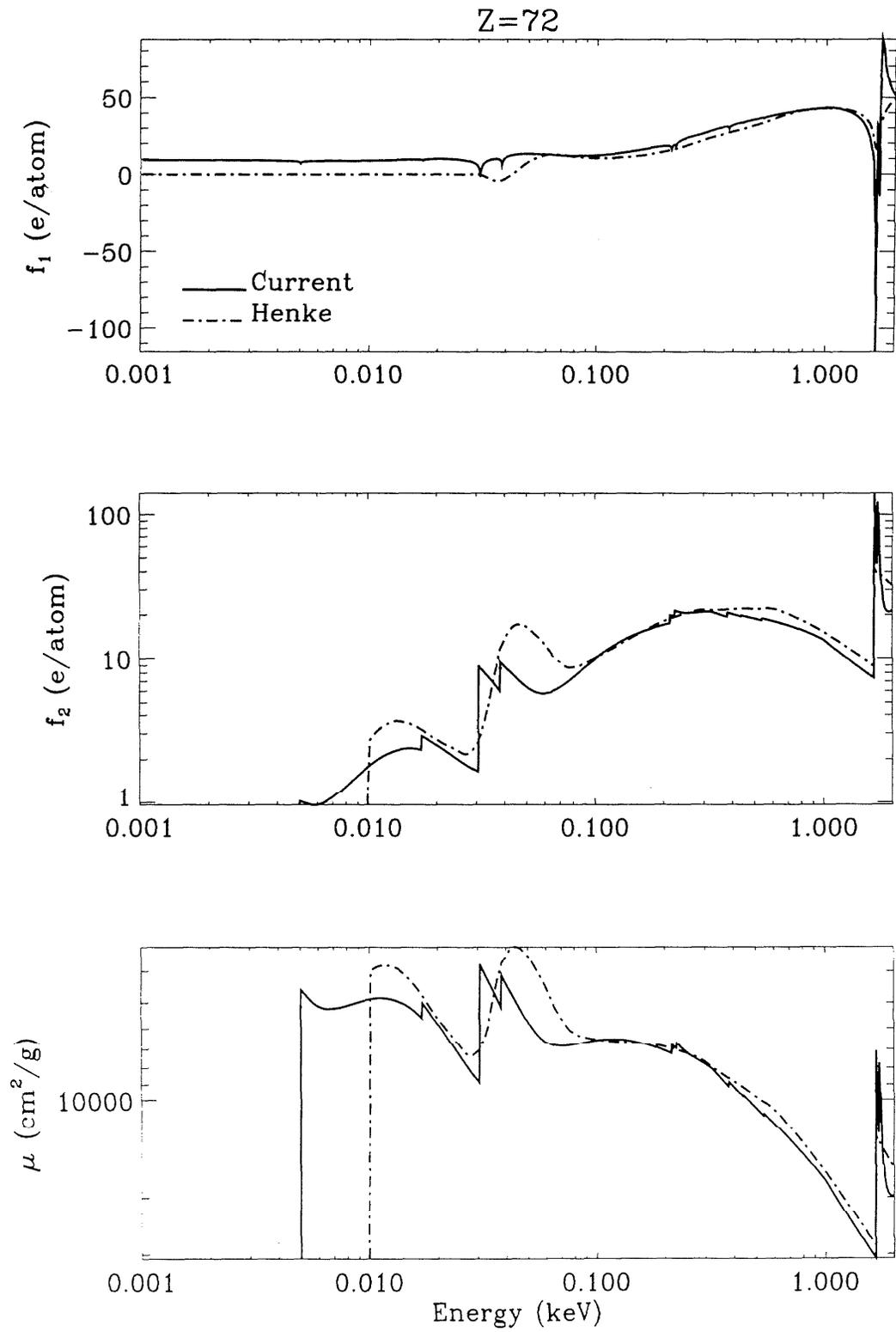
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

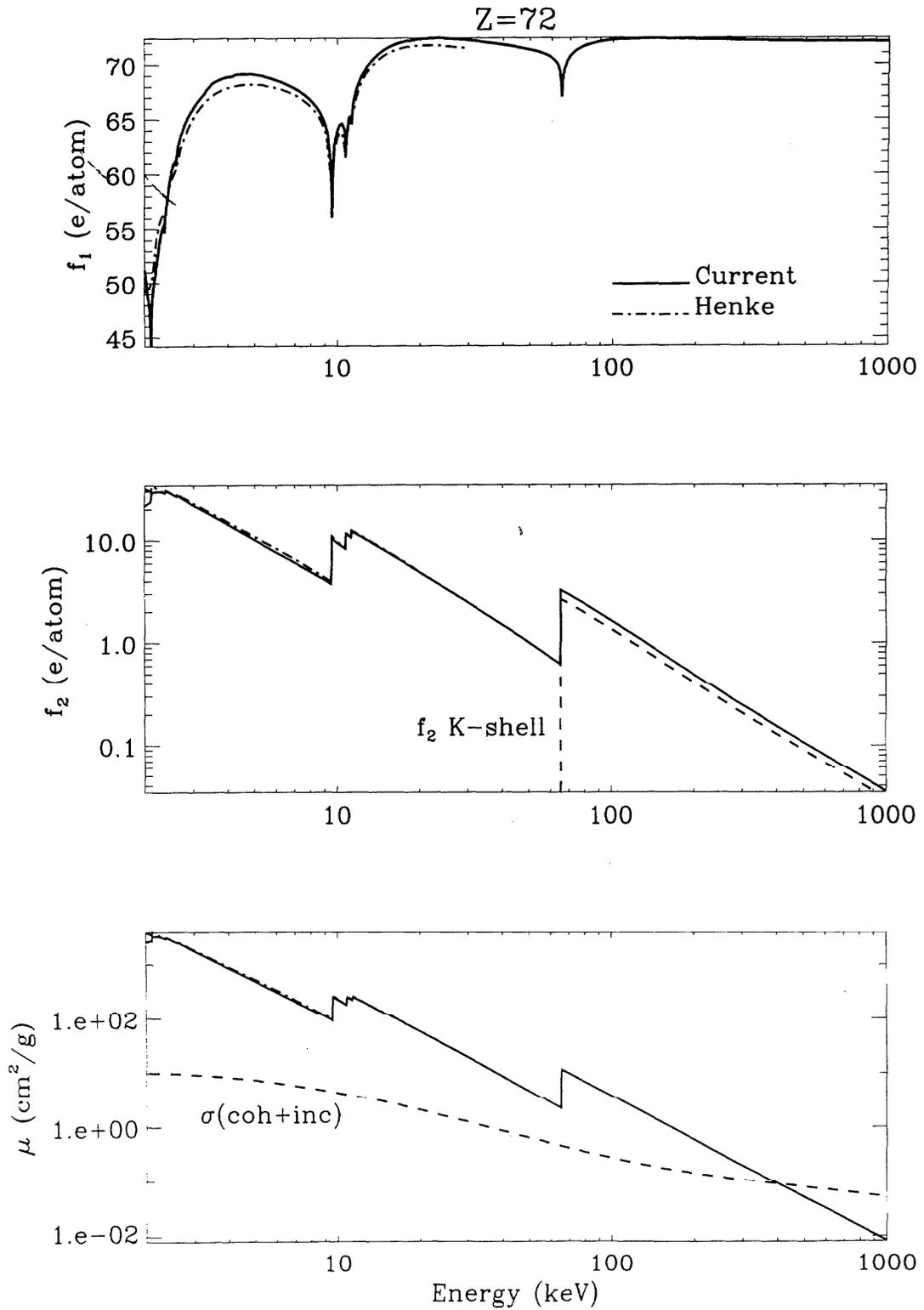
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
9.653919E+00	6.09185E+01	1.0263E+01	2.5063E+02	4.5388E+00	0.000E+00	1.284E-01
9.751914E+00	6.24638E+01	1.0031E+01	2.4251E+02	4.4965E+00	0.000E+00	1.271E-01
1.032004E+01	6.45998E+01	8.9060E+00	2.0345E+02	4.2632E+00	0.000E+00	1.201E-01
1.052461E+01	6.43529E+01	8.5827E+00	1.9226E+02	4.1838E+00	0.000E+00	1.178E-01
1.068570E+01	6.31524E+01	8.3464E+00	1.8415E+02	4.1229E+00	0.000E+00	1.160E-01
1.072866E+01	6.14934E+01	8.2858E+00	1.8208E+02	4.1069E+00	0.000E+00	1.156E-01
1.079310E+01	6.32855E+01	1.1547E+01	2.5222E+02	4.0831E+00	0.000E+00	1.149E-01
1.095419E+01	6.48990E+01	1.1216E+01	2.4140E+02	4.0245E+00	0.000E+00	1.132E-01
1.103212E+01	6.52180E+01	1.1063E+01	2.3641E+02	3.9966E+00	0.000E+00	1.124E-01
1.104529E+01	6.52568E+01	1.1037E+01	2.3558E+02	3.9919E+00	0.000E+00	1.123E-01
1.121435E+01	6.52382E+01	1.0718E+01	2.2532E+02	3.9326E+00	0.000E+00	1.106E-01
1.125943E+01	6.45312E+01	1.0636E+01	2.2269E+02	3.9170E+00	0.000E+00	1.101E-01
1.132705E+01	6.55849E+01	1.2203E+01	2.5398E+02	3.8938E+00	0.000E+00	1.095E-01
1.149611E+01	6.67877E+01	1.1917E+01	2.4440E+02	3.8368E+00	0.000E+00	1.078E-01
1.179334E+01	6.78684E+01	1.1453E+01	2.2896E+02	3.7397E+00	0.000E+00	1.051E-01
1.260708E+01	6.95052E+01	1.0335E+01	1.9328E+02	3.4928E+00	0.000E+00	9.834E-02
1.347697E+01	7.04863E+01	9.3120E+00	1.6290E+02	3.2564E+00	0.000E+00	9.200E-02
1.440688E+01	7.11522E+01	8.3767E+00	1.3708E+02	3.0308E+00	0.000E+00	8.606E-02
1.540095E+01	7.16018E+01	7.5130E+00	1.1501E+02	2.8161E+00	0.000E+00	8.050E-02
1.646362E+01	7.18997E+01	6.7329E+00	9.6414E+01	2.6124E+00	0.000E+00	7.531E-02
1.759961E+01	7.20921E+01	6.0332E+00	8.0819E+01	2.4197E+00	0.000E+00	7.045E-02
1.881398E+01	7.22104E+01	5.4086E+00	6.7775E+01	2.2380E+00	0.000E+00	6.590E-02
2.011215E+01	7.23359E+01	4.8448E+00	5.6791E+01	2.0669E+00	0.000E+00	6.165E-02
2.149988E+01	7.23919E+01	4.3415E+00	4.7607E+01	1.9065E+00	0.000E+00	5.767E-02
2.298338E+01	7.24141E+01	3.8876E+00	3.9878E+01	1.7563E+00	0.000E+00	5.395E-02
2.456923E+01	7.23832E+01	3.4797E+00	3.3390E+01	1.6160E+00	0.000E+00	5.046E-02
2.626450E+01	7.23387E+01	3.1172E+00	2.7981E+01	1.4855E+00	0.000E+00	4.721E-02
2.807676E+01	7.22919E+01	2.7722E+00	2.3278E+01	1.3641E+00	0.000E+00	4.416E-02
3.001405E+01	7.22127E+01	2.4608E+00	1.9329E+01	1.2517E+00	0.000E+00	4.131E-02
3.208502E+01	7.21207E+01	2.1862E+00	1.6064E+01	1.1476E+00	0.000E+00	3.864E-02
3.429889E+01	7.20209E+01	1.9439E+00	1.3362E+01	1.0516E+00	0.000E+00	3.615E-02
3.666551E+01	7.19153E+01	1.7298E+00	1.1122E+01	9.6318E-01	0.000E+00	3.381E-02
3.919543E+01	7.18046E+01	1.5404E+00	9.2652E+00	8.8190E-01	0.000E+00	3.163E-02
4.189992E+01	7.16879E+01	1.3723E+00	7.7215E+00	8.0734E-01	0.000E+00	2.959E-02
4.479101E+01	7.15613E+01	1.2211E+00	6.4274E+00	7.3907E-01	0.000E+00	2.768E-02
4.788159E+01	7.14197E+01	1.0864E+00	5.3490E+00	6.7666E-01	0.000E+00	2.589E-02
5.118542E+01	7.12520E+01	9.6347E-01	4.4377E+00	6.1972E-01	0.000E+00	2.422E-02
5.471721E+01	7.10351E+01	8.5374E-01	3.6785E+00	5.6785E-01	0.000E+00	2.266E-02
5.849270E+01	7.07149E+01	7.5663E-01	3.0496E+00	5.2067E-01	0.000E+00	2.120E-02
6.252870E+01	7.00604E+01	6.7096E-01	2.5298E+00	4.7781E-01	0.000E+00	1.983E-02
6.404378E+01	6.94683E+01	6.4276E-01	2.3661E+00	4.6343E-01	0.000E+00	1.936E-02
6.502405E+01	6.83536E+01	6.2552E-01	2.2679E+00	4.5455E-01	0.000E+00	1.907E-02
6.528545E+01	6.70188E+01	6.2105E-01	2.2427E+00	4.5224E-01	0.000E+00	1.899E-02
6.567755E+01	6.83677E+01	3.2419E+00	1.1637E+01	4.4882E-01	9.432E+00	1.888E-02
6.665782E+01	6.95858E+01	3.1695E+00	1.1210E+01	4.4048E-01	9.093E+00	1.860E-02
6.684318E+01	6.97049E+01	3.1561E+00	1.1132E+01	4.3894E-01	9.031E+00	1.855E-02
7.145536E+01	7.09895E+01	2.8423E+00	9.3777E+00	4.0372E-01	7.633E+00	1.735E-02
7.638578E+01	7.15015E+01	2.5508E+00	7.8727E+00	3.7184E-01	6.422E+00	1.623E-02
8.165640E+01	7.18021E+01	2.2872E+00	6.6035E+00	3.4301E-01	5.400E+00	1.518E-02
8.729069E+01	7.19969E+01	2.0458E+00	5.5254E+00	3.1695E-01	4.532E+00	1.420E-02
9.331374E+01	7.21242E+01	1.8267E+00	4.6153E+00	2.9343E-01	3.795E+00	1.329E-02
9.975239E+01	7.22082E+01	1.6314E+00	3.8556E+00	2.7219E-01	3.178E+00	1.243E-02
1.066353E+02	7.22630E+01	1.4571E+00	3.2214E+00	2.5301E-01	2.661E+00	1.163E-02
1.139931E+02	7.22974E+01	1.3016E+00	2.6919E+00	2.3570E-01	2.228E+00	1.088E-02
1.218587E+02	7.23173E+01	1.1628E+00	2.2497E+00	2.2007E-01	1.866E+00	1.017E-02
1.302669E+02	7.23272E+01	1.0390E+00	1.8804E+00	2.0595E-01	1.562E+00	9.518E-03
1.392553E+02	7.23560E+01	9.2499E-01	1.5660E+00	1.9317E-01	1.302E+00	8.903E-03
1.488640E+02	7.23494E+01	8.2342E-01	1.3041E+00	1.8160E-01	1.085E+00	8.329E-03
1.591350E+02	7.23382E+01	7.3307E-01	1.0860E+00	1.7111E-01	9.044E-01	7.791E-03
1.701159E+02	7.23239E+01	6.5271E-01	9.0456E-01	1.6158E-01	7.537E-01	7.288E-03
1.818539E+02	7.23076E+01	5.8120E-01	7.5347E-01	1.5290E-01	6.281E-01	6.818E-03
1.944018E+02	7.22902E+01	5.1758E-01	6.2768E-01	1.4498E-01	5.235E-01	6.378E-03
2.078156E+02	7.22722E+01	4.6096E-01	5.2293E-01	1.3772E-01	4.363E-01	5.966E-03
2.221548E+02	7.22541E+01	4.1057E-01	4.3570E-01	1.3106E-01	3.636E-01	5.581E-03
2.374835E+02	7.22361E+01	3.6571E-01	3.6305E-01	1.2493E-01	3.030E-01	5.221E-03

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 501

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV --- Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
2.538699E+02	7.22185E+01	3.2579E-01	3.0254E-01	1.1925E-01	2.525E-01	4.884E-03
2.713869E+02	7.22012E+01	2.9024E-01	2.5214E-01	1.1399E-01	2.105E-01	4.569E-03
2.901126E+02	7.21845E+01	2.5925E-01	2.1068E-01	1.0908E-01	1.759E-01	4.274E-03
3.101304E+02	7.21691E+01	2.3263E-01	1.7684E-01	1.0449E-01	1.479E-01	3.998E-03
3.315294E+02	7.21552E+01	2.0876E-01	1.4845E-01	1.0018E-01	1.243E-01	3.740E-03
3.544049E+02	7.21423E+01	1.8735E-01	1.2463E-01	9.6114E-02	1.044E-01	3.498E-03
3.788588E+02	7.21305E+01	1.6815E-01	1.0464E-01	9.2268E-02	8.777E-02	3.273E-03
4.050001E+02	7.21195E+01	1.5093E-01	8.7857E-02	8.8614E-02	7.377E-02	3.061E-03
4.329451E+02	7.21094E+01	1.3548E-01	7.3773E-02	8.5133E-02	6.200E-02	2.864E-03





Ta $Z = 73$ Atomic weight = 1.809479E+02 g/mol, nominal density ρ (g/cm³) = 1.6624E+01 μ_a (barns/atom) = μ (cm²/g) \times 3.00471E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.32555E+05

20 edges. Edge energies (keV):

K		6.74164E+00	L	I	1.16815E+00	L	II	1.11361E+00	L	III	9.88110E+00
M		2.70800E+00	M	II	2.46870E+00	M	III	2.19400E+00	M	IV	1.79320E+00
M	V	7.73510E+00	N	I	5.65500E-00	N	II	4.64800E-00	N	III	4.04500E-01
N	IV	2.41300E-00	N	V	2.29300E-00	O	I	2.50000E-02	O	II	2.50000E-02
O	III	7.11000E-02	N	VI	4.49000E-02	N	VII	3.64000E-02	O	IV	5.70000E-03

Relativistic correction f_{rel} (H82,3/5CL) = -1.4008E+00, -8.3100E-01 e/atomNuclear Thomson correction f_{NT} = -1.6156E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
5.58600E-03	7.28675E+00	0.0000E+00	0.0000E+00	1.1072E-05	0.000E+00	2.220E+02
5.671500E-03	6.76355E+00	0.0000E+00	0.0000E+00	1.2001E-05	0.000E+00	2.186E+02
5.694300E-03	6.16326E+00	0.0000E+00	0.0000E+00	1.2259E-05	0.000E+00	2.177E+02
5.728500E-03	6.76103E+00	1.1669E+00	4.7371E+04	1.2653E-05	0.000E+00	2.164E+02
5.814000E-03	7.26809E+00	1.1599E+00	4.6396E+04	1.3682E-05	0.000E+00	2.133E+02
1.069000E-02	7.69658E+00	2.5477E+00	5.5425E+04	2.7176E-04	0.000E+00	1.160E+02
1.142761E-02	7.80670E+00	2.8946E+00	5.8905E+04	3.6733E-04	0.000E+00	1.085E+02
1.221612E-02	7.98392E+00	3.2454E+00	6.1782E+04	4.9401E-04	0.000E+00	1.015E+02
1.305903E-02	8.23109E+00	3.5808E+00	6.3767E+04	6.6105E-04	0.000E+00	9.494E+01
1.396010E-02	8.54464E+00	3.8799E+00	6.4634E+04	8.8017E-04	0.000E+00	8.881E+01
1.492335E-02	8.91402E+00	4.1228E+00	6.4246E+04	1.1661E-03	0.000E+00	8.308E+01
1.595306E-02	9.32207E+00	4.2927E+00	6.2577E+04	1.5374E-03	0.000E+00	7.772E+01
1.705382E-02	9.74633E+00	4.3785E+00	5.9707E+04	2.0169E-03	0.000E+00	7.270E+01
1.823053E-02	1.01860E+01	4.3754E+00	5.5814E+04	2.6332E-03	0.000E+00	6.801E+01
1.948844E-02	1.05634E+01	4.2858E+00	5.1143E+04	3.4212E-03	0.000E+00	6.362E+01
2.083314E-02	1.08749E+01	4.1184E+00	4.5972E+04	4.4236E-03	0.000E+00	5.951E+01
2.227063E-02	1.10871E+01	3.8864E+00	4.0582E+04	5.6924E-03	0.000E+00	5.567E+01
2.380730E-02	1.11318E+01	3.6051E+00	3.5215E+04	7.2903E-03	0.000E+00	5.208E+01
2.450000E-02	1.10153E+01	3.4725E+00	3.2961E+04	8.0966E-03	0.000E+00	5.061E+01
2.487500E-02	1.07494E+01	3.4002E+00	3.1788E+04	8.5561E-03	0.000E+00	4.984E+01
2.497500E-02	1.04085E+01	3.3809E+00	3.1481E+04	8.6814E-03	0.000E+00	4.964E+01
2.512500E-02	1.07805E+01	4.0323E+00	3.7323E+04	8.8716E-03	0.000E+00	4.935E+01
2.545001E-02	1.10837E+01	3.9475E+00	3.6071E+04	9.2928E-03	0.000E+00	4.872E+01
2.550000E-02	1.11091E+01	3.9346E+00	3.5883E+04	9.3587E-03	0.000E+00	4.862E+01
2.720606E-02	1.13983E+01	3.5119E+00	3.0020E+04	1.1790E-02	0.000E+00	4.557E+01
2.908327E-02	1.12851E+01	3.1071E+00	2.4845E+04	1.4888E-02	0.000E+00	4.263E+01
3.109002E-02	1.08955E+01	2.7577E+00	2.0628E+04	1.8713E-02	0.000E+00	3.988E+01
3.323523E-02	1.01007E+01	2.4597E+00	1.7211E+04	2.3413E-02	0.000E+00	3.731E+01
3.552846E-02	7.89513E+00	2.2126E+00	1.4483E+04	2.9160E-02	0.000E+00	3.490E+01
3.567200E-02	7.57475E+00	2.1993E+00	1.4338E+04	2.9545E-02	0.000E+00	3.476E+01
3.621800E-02	5.03659E+00	2.1510E+00	1.3811E+04	3.1037E-02	0.000E+00	3.423E+01
3.636360E-02	1.99183E+00	2.1387E+00	1.3677E+04	3.1442E-02	0.000E+00	3.410E+01
3.658200E-02	5.19860E+00	8.1125E+00	5.1572E+04	3.2056E-02	0.000E+00	3.389E+01
3.712800E-02	7.98196E+00	7.8708E+00	4.9299E+04	3.3621E-02	0.000E+00	3.339E+01
3.797993E-02	9.52533E+00	7.5184E+00	4.6036E+04	3.6152E-02	0.000E+00	3.264E+01
4.060054E-02	1.11476E+01	6.5983E+00	3.7794E+04	4.4618E-02	0.000E+00	3.054E+01
4.340198E-02	1.11433E+01	5.7736E+00	3.0936E+04	5.4820E-02	0.000E+00	2.857E+01
4.400200E-02	1.08095E+01	5.6160E+00	2.9681E+04	5.7161E-02	0.000E+00	2.818E+01
4.467550E-02	9.67052E+00	5.4478E+00	2.8358E+04	5.9854E-02	0.000E+00	2.775E+01
4.485510E-02	8.21964E+00	5.4045E+00	2.8020E+04	6.0584E-02	0.000E+00	2.764E+01
4.512450E-02	9.77292E+00	8.2372E+00	4.2452E+04	6.1689E-02	0.000E+00	2.748E+01
4.579800E-02	1.11684E+01	8.0408E+00	4.0830E+04	6.4498E-02	0.000E+00	2.707E+01
4.639671E-02	1.17160E+01	7.8751E+00	3.9472E+04	6.7054E-02	0.000E+00	2.672E+01
4.959809E-02	1.29598E+01	7.1262E+00	3.3413E+04	8.1656E-02	0.000E+00	2.500E+01
5.302035E-02	1.34527E+01	6.4845E+00	2.8442E+04	9.9000E-02	0.000E+00	2.338E+01
5.667876E-02	1.35799E+01	5.9403E+00	2.4373E+04	1.1950E-01	0.000E+00	2.187E+01
6.058959E-02	1.34579E+01	5.5463E+00	2.1288E+04	1.4363E-01	0.000E+00	2.046E+01
6.477028E-02	1.31680E+01	5.3333E+00	1.9149E+04	1.7188E-01	0.000E+00	1.914E+01
6.923942E-02	1.27668E+01	5.3146E+00	1.7850E+04	2.0480E-01	0.000E+00	1.791E+01
6.967800E-02	1.27230E+01	5.3230E+00	1.7766E+04	2.0818E-01	0.000E+00	1.779E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 505

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
7.074450E-02	1.26034E+01	5.3504E+00	1.7588E+04	2.1650E-01	0.000E+00	1.753E+01
7.102890E-02	1.25498E+01	5.3593E+00	1.7547E+04	2.1875E-01	0.000E+00	1.746E+01
7.145550E-02	1.25391E+01	5.4288E+00	1.7668E+04	2.2214E-01	0.000E+00	1.735E+01
7.252200E-02	1.24678E+01	5.4730E+00	1.7550E+04	2.3072E-01	0.000E+00	1.710E+01
7.401695E-02	1.23489E+01	5.5495E+00	1.7436E+04	2.4299E-01	0.000E+00	1.675E+01
7.912411E-02	1.21364E+01	5.9225E+00	1.7407E+04	2.8709E-01	0.000E+00	1.567E+01
8.458368E-02	1.17681E+01	6.4758E+00	1.7804E+04	3.3777E-01	0.000E+00	1.466E+01
9.041995E-02	1.14742E+01	7.1961E+00	1.8508E+04	3.9573E-01	0.000E+00	1.371E+01
9.665893E-02	1.12899E+01	8.0678E+00	1.9411E+04	4.6173E-01	0.000E+00	1.283E+01
1.033284E-01	1.12531E+01	9.0673E+00	2.0407E+04	5.3652E-01	0.000E+00	1.200E+01
1.104581E-01	1.13843E+01	1.0141E+01	2.1351E+04	6.2088E-01	0.000E+00	1.122E+01
1.180797E-01	1.16865E+01	1.1251E+01	2.2159E+04	7.1560E-01	0.000E+00	1.050E+01
1.262272E-01	1.21528E+01	1.2364E+01	2.2778E+04	8.2145E-01	0.000E+00	9.822E+00
1.349368E-01	1.27723E+01	1.3449E+01	2.3179E+04	9.3918E-01	0.000E+00	9.188E+00
1.442475E-01	1.35288E+01	1.4484E+01	2.3351E+04	1.0695E+00	0.000E+00	8.595E+00
1.542005E-01	1.44022E+01	1.5448E+01	2.3298E+04	1.2132E+00	0.000E+00	8.040E+00
1.648404E-01	1.53689E+01	1.6327E+01	2.3034E+04	1.3708E+00	0.000E+00	7.521E+00
1.762144E-01	1.64015E+01	1.7112E+01	2.2583E+04	1.5428E+00	0.000E+00	7.036E+00
1.883732E-01	1.74671E+01	1.7797E+01	2.1971E+04	1.7298E+00	0.000E+00	6.582E+00
2.013709E-01	1.85176E+01	1.8384E+01	2.1231E+04	1.9320E+00	0.000E+00	6.157E+00
2.152655E-01	1.94419E+01	1.8876E+01	2.0392E+04	2.1497E+00	0.000E+00	5.760E+00
2.247140E-01	1.97006E+01	1.9146E+01	1.9814E+04	2.2980E+00	0.000E+00	5.517E+00
2.281535E-01	1.93069E+01	1.9233E+01	1.9604E+04	2.3520E+00	0.000E+00	5.434E+00
2.290707E-01	1.85987E+01	1.9255E+01	1.9548E+04	2.3664E+00	0.000E+00	5.412E+00
2.301188E-01	1.93136E+01	2.0802E+01	2.1022E+04	2.3829E+00	0.000E+00	5.388E+00
2.304465E-01	1.95039E+01	2.0804E+01	2.0995E+04	2.3880E+00	0.000E+00	5.380E+00
2.338860E-01	2.04059E+01	2.0825E+01	2.0706E+04	2.4419E+00	0.000E+00	5.301E+00
2.364740E-01	2.07303E+01	2.0839E+01	2.0494E+04	2.4825E+00	0.000E+00	5.243E+00
2.400935E-01	2.07908E+01	2.0857E+01	2.0202E+04	2.5392E+00	0.000E+00	5.164E+00
2.410587E-01	2.03502E+01	2.0862E+01	2.0126E+04	2.5543E+00	0.000E+00	5.143E+00
2.425065E-01	2.11426E+01	2.1990E+01	2.1087E+04	2.5769E+00	0.000E+00	5.113E+00
2.459970E-01	2.20772E+01	2.1957E+01	2.0757E+04	2.6315E+00	0.000E+00	5.040E+00
2.461260E-01	2.21023E+01	2.1956E+01	2.0745E+04	2.6335E+00	0.000E+00	5.037E+00
2.629708E-01	2.43119E+01	2.1747E+01	1.9231E+04	2.8953E+00	0.000E+00	4.715E+00
2.811158E-01	2.58639E+01	2.1470E+01	1.7761E+04	3.1739E+00	0.000E+00	4.410E+00
3.005128E-01	2.71910E+01	2.1254E+01	1.6448E+04	3.4666E+00	0.000E+00	4.126E+00
3.212482E-01	2.83891E+01	2.1057E+01	1.5243E+04	3.7726E+00	0.000E+00	3.859E+00
3.434143E-01	2.94763E+01	2.0868E+01	1.4131E+04	4.0908E+00	0.000E+00	3.610E+00
3.671099E-01	3.04296E+01	2.0687E+01	1.3105E+04	4.4202E+00	0.000E+00	3.377E+00
3.924405E-01	3.10594E+01	2.0517E+01	1.2158E+04	4.7592E+00	0.000E+00	3.159E+00
3.964100E-01	3.10502E+01	2.0492E+01	1.2022E+04	4.8111E+00	0.000E+00	3.128E+00
4.024775E-01	3.06884E+01	2.0456E+01	1.1820E+04	4.8897E+00	0.000E+00	3.081E+00
4.040955E-01	3.00444E+01	2.0446E+01	1.1767E+04	4.9106E+00	0.000E+00	3.068E+00
4.065225E-01	3.08470E+01	2.1817E+01	1.2481E+04	4.9417E+00	0.000E+00	3.050E+00
4.125900E-01	3.16975E+01	2.1794E+01	1.2284E+04	5.0190E+00	0.000E+00	3.005E+00
4.195189E-01	3.22431E+01	2.1769E+01	1.2067E+04	5.1063E+00	0.000E+00	2.955E+00
4.484657E-01	3.38018E+01	2.1674E+01	1.1239E+04	5.4597E+00	0.000E+00	2.765E+00
4.555040E-01	3.40950E+01	2.1653E+01	1.1055E+04	5.5429E+00	0.000E+00	2.722E+00
4.624760E-01	3.42849E+01	2.1633E+01	1.0878E+04	5.6242E+00	0.000E+00	2.681E+00
4.643352E-01	3.41970E+01	2.1628E+01	1.0832E+04	5.6457E+00	0.000E+00	2.670E+00
4.671240E-01	3.45086E+01	2.1968E+01	1.0937E+04	5.6779E+00	0.000E+00	2.654E+00
4.740960E-01	3.49966E+01	2.1863E+01	1.0724E+04	5.7575E+00	0.000E+00	2.615E+00
4.794098E-01	3.52911E+01	2.1749E+01	1.0550E+04	5.8174E+00	0.000E+00	2.586E+00
5.124891E-01	3.67329E+01	2.1072E+01	9.5619E+03	6.1775E+00	0.000E+00	2.419E+00
5.478508E-01	3.78288E+01	2.0397E+01	8.6583E+03	6.5376E+00	0.000E+00	2.263E+00
5.541900E-01	3.79581E+01	2.0281E+01	8.5104E+03	6.5996E+00	0.000E+00	2.237E+00
5.626725E-01	3.79871E+01	2.0127E+01	8.3184E+03	6.6812E+00	0.000E+00	2.203E+00
5.649345E-01	3.77833E+01	2.0086E+01	8.2683E+03	6.7028E+00	0.000E+00	2.195E+00
5.683275E-01	3.81559E+01	2.0556E+01	8.4115E+03	6.7349E+00	0.000E+00	2.182E+00
5.768100E-01	3.86364E+01	2.0408E+01	8.2280E+03	6.8143E+00	0.000E+00	2.149E+00
5.856525E-01	3.89816E+01	2.0255E+01	8.0432E+03	6.8956E+00	0.000E+00	2.117E+00
6.260625E-01	4.01908E+01	1.9579E+01	7.2728E+03	7.2489E+00	0.000E+00	1.980E+00
6.692609E-01	4.12085E+01	1.8887E+01	6.5630E+03	7.5953E+00	0.000E+00	1.853E+00
7.154399E-01	4.20994E+01	1.8176E+01	5.9081E+03	7.9322E+00	0.000E+00	1.733E+00
7.648052E-01	4.28870E+01	1.7445E+01	5.3045E+03	8.2573E+00	0.000E+00	1.621E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
8.175768E-01	4.35557E+01	1.6696E+01	4.7491E+03	8.5681E+00	0.000E+00	1.516E+00
8.739896E-01	4.41047E+01	1.5933E+01	4.2396E+03	8.8623E+00	0.000E+00	1.419E+00
9.342948E-01	4.45363E+01	1.5166E+01	3.7750E+03	9.1377E+00	0.000E+00	1.327E+00
9.987612E-01	4.48812E+01	1.4401E+01	3.3531E+03	9.3924E+00	0.000E+00	1.241E+00
1.067676E+00	4.48897E+01	1.3200E+01	2.8752E+03	9.6243E+00	0.000E+00	1.161E+00
1.141345E+00	4.44916E+01	1.2121E+01	2.4697E+03	9.8317E+00	0.000E+00	1.086E+00
1.220098E+00	4.36912E+01	1.1156E+01	2.1264E+03	1.0013E+01	0.000E+00	1.016E+00
1.304285E+00	4.23871E+01	1.0292E+01	1.8351E+03	1.0167E+01	0.000E+00	9.506E-01
1.394281E+00	4.03100E+01	9.5151E+00	1.5870E+03	1.0293E+01	0.000E+00	8.892E-01
1.490486E+00	3.67822E+01	8.8155E+00	1.3754E+03	1.0390E+01	0.000E+00	8.318E-01
1.593329E+00	2.95194E+01	8.1845E+00	1.1946E+03	1.0457E+01	0.000E+00	7.781E-01
1.700398E+00	1.37058E+00	7.6136E+00	1.0413E+03	1.0494E+01	0.000E+00	7.291E-01
1.703269E+00	-8.29974E-01	7.5994E+00	1.0376E+03	1.0494E+01	0.000E+00	7.279E-01
1.726425E+00	-4.04092E+01	7.4871E+00	1.0085E+03	1.0498E+01	0.000E+00	7.182E-01
1.733365E+00	-1.04851E+02	7.4542E+00	1.0001E+03	1.0499E+01	0.000E+00	7.153E-01
1.743776E+00	-2.91157E+00	1.3260E+02	1.7684E+04	1.0500E+01	0.000E+00	7.110E-01
1.757336E+00	3.90908E+01	9.4749E+01	1.2539E+04	1.0501E+01	0.000E+00	7.055E-01
1.769802E+00	4.51559E+01	7.0260E+01	9.2323E+03	1.0502E+01	0.000E+00	7.006E-01
1.784234E+00	2.93243E+01	5.0431E+01	6.5731E+03	1.0502E+01	0.000E+00	6.949E-01
1.791407E+00	-1.41137E+01	4.3063E+01	5.5903E+03	1.0502E+01	0.000E+00	6.921E-01
1.802166E+00	5.51641E+01	1.1945E+02	1.5414E+04	1.0502E+01	0.000E+00	6.880E-01
1.820795E+00	8.52606E+01	7.6459E+01	9.7654E+03	1.0501E+01	0.000E+00	6.809E-01
1.829064E+00	8.70266E+01	6.4816E+01	8.2409E+03	1.0501E+01	0.000E+00	6.779E-01
1.946430E+00	6.18642E+01	2.1959E+01	2.6236E+03	1.0479E+01	0.000E+00	6.370E-01
2.080733E+00	5.26004E+01	2.1587E+01	2.4127E+03	1.0427E+01	0.000E+00	5.959E-01
2.150120E+00	5.00704E+01	2.2827E+01	2.4689E+03	1.0391E+01	0.000E+00	5.766E-01
2.183030E+00	4.79497E+01	2.3530E+01	2.5066E+03	1.0372E+01	0.000E+00	5.679E-01
2.191806E+00	4.55689E+01	2.3723E+01	2.5170E+03	1.0367E+01	0.000E+00	5.657E-01
2.204970E+00	4.80567E+01	2.8724E+01	3.0295E+03	1.0359E+01	0.000E+00	5.623E-01
2.224304E+00	4.98194E+01	2.9062E+01	3.0385E+03	1.0347E+01	0.000E+00	5.574E-01
2.237880E+00	5.05826E+01	2.9298E+01	3.0445E+03	1.0338E+01	0.000E+00	5.540E-01
2.377781E+00	5.56444E+01	2.9665E+01	2.9014E+03	1.0240E+01	0.000E+00	5.214E-01
2.419326E+00	5.65966E+01	2.9294E+01	2.8158E+03	1.0207E+01	0.000E+00	5.125E-01
2.456356E+00	5.68380E+01	2.8868E+01	2.7331E+03	1.0178E+01	0.000E+00	5.047E-01
2.466231E+00	5.61419E+01	2.8741E+01	2.7102E+03	1.0170E+01	0.000E+00	5.027E-01
2.481043E+00	5.74961E+01	3.0421E+01	2.8514E+03	1.0157E+01	0.000E+00	4.997E-01
2.518074E+00	5.92314E+01	2.9807E+01	2.7328E+03	1.0126E+01	0.000E+00	4.924E-01
2.541848E+00	5.99713E+01	2.9389E+01	2.6889E+03	1.0106E+01	0.000E+00	4.878E-01
2.653840E+00	6.21300E+01	2.7375E+01	2.3989E+03	1.0006E+01	0.000E+00	4.672E-01
2.694460E+00	6.23004E+01	2.6665E+01	2.3014E+03	9.9683E+00	0.000E+00	4.601E-01
2.705292E+00	6.18776E+01	2.6478E+01	2.2762E+03	9.9582E+00	0.000E+00	4.583E-01
2.717235E+00	6.24913E+01	2.7418E+01	2.3466E+03	9.9470E+00	0.000E+00	4.563E-01
2.721540E+00	6.26917E+01	2.7344E+01	2.3366E+03	9.9429E+00	0.000E+00	4.556E-01
2.762160E+00	6.37226E+01	2.6657E+01	2.2444E+03	9.9043E+00	0.000E+00	4.489E-01
2.904724E+00	6.55359E+01	2.4485E+01	1.9603E+03	9.7649E+00	0.000E+00	4.268E-01
3.105150E+00	6.68792E+01	2.2128E+01	1.6573E+03	9.5610E+00	0.000E+00	3.993E-01
3.319406E+00	6.78724E+01	2.0086E+01	1.4072E+03	9.3372E+00	0.000E+00	3.735E-01
3.548445E+00	6.88402E+01	1.8210E+01	1.1934E+03	9.0954E+00	0.000E+00	3.494E-01
3.793288E+00	6.94954E+01	1.6415E+01	1.0063E+03	8.8376E+00	0.000E+00	3.269E-01
4.055024E+00	6.97903E+01	1.4818E+01	8.4979E+02	8.5657E+00	0.000E+00	3.058E-01
4.334821E+00	6.99592E+01	1.3402E+01	7.1901E+02	8.2818E+00	0.000E+00	2.860E-01
4.633924E+00	7.01464E+01	1.2084E+01	6.0646E+02	7.9879E+00	0.000E+00	2.676E-01
4.953664E+00	7.01733E+01	1.0900E+01	5.1170E+02	7.6860E+00	0.000E+00	2.503E-01
5.295467E+00	7.00792E+01	9.8206E+00	4.3128E+02	7.3781E+00	0.000E+00	2.341E-01
5.660855E+00	6.99372E+01	8.8550E+00	3.6378E+02	7.0660E+00	0.000E+00	2.190E-01
6.051453E+00	6.97167E+01	7.9928E+00	3.0716E+02	6.7517E+00	0.000E+00	2.049E-01
6.469004E+00	6.94432E+01	7.2248E+00	2.5973E+02	6.4369E+00	0.000E+00	1.917E-01
6.915365E+00	6.91140E+01	6.5400E+00	2.1993E+02	6.1231E+00	0.000E+00	1.793E-01
7.392525E+00	6.87163E+01	5.9283E+00	1.8649E+02	5.8119E+00	0.000E+00	1.677E-01
7.902609E+00	6.82155E+01	5.3635E+00	1.5783E+02	5.5047E+00	0.000E+00	1.569E-01
8.447890E+00	6.75254E+01	4.8481E+00	1.3346E+02	5.2028E+00	0.000E+00	1.468E-01
9.030794E+00	6.64617E+01	4.3729E+00	1.1261E+02	4.9073E+00	0.000E+00	1.373E-01
9.653919E+00	6.37140E+01	3.8954E+00	9.3837E+01	4.6192E+00	0.000E+00	1.284E-01
9.683478E+00	6.34252E+01	3.8744E+00	9.3045E+01	4.6062E+00	0.000E+00	1.280E-01
9.831694E+00	6.05401E+01	3.7718E+00	8.9217E+01	4.5419E+00	0.000E+00	1.261E-01

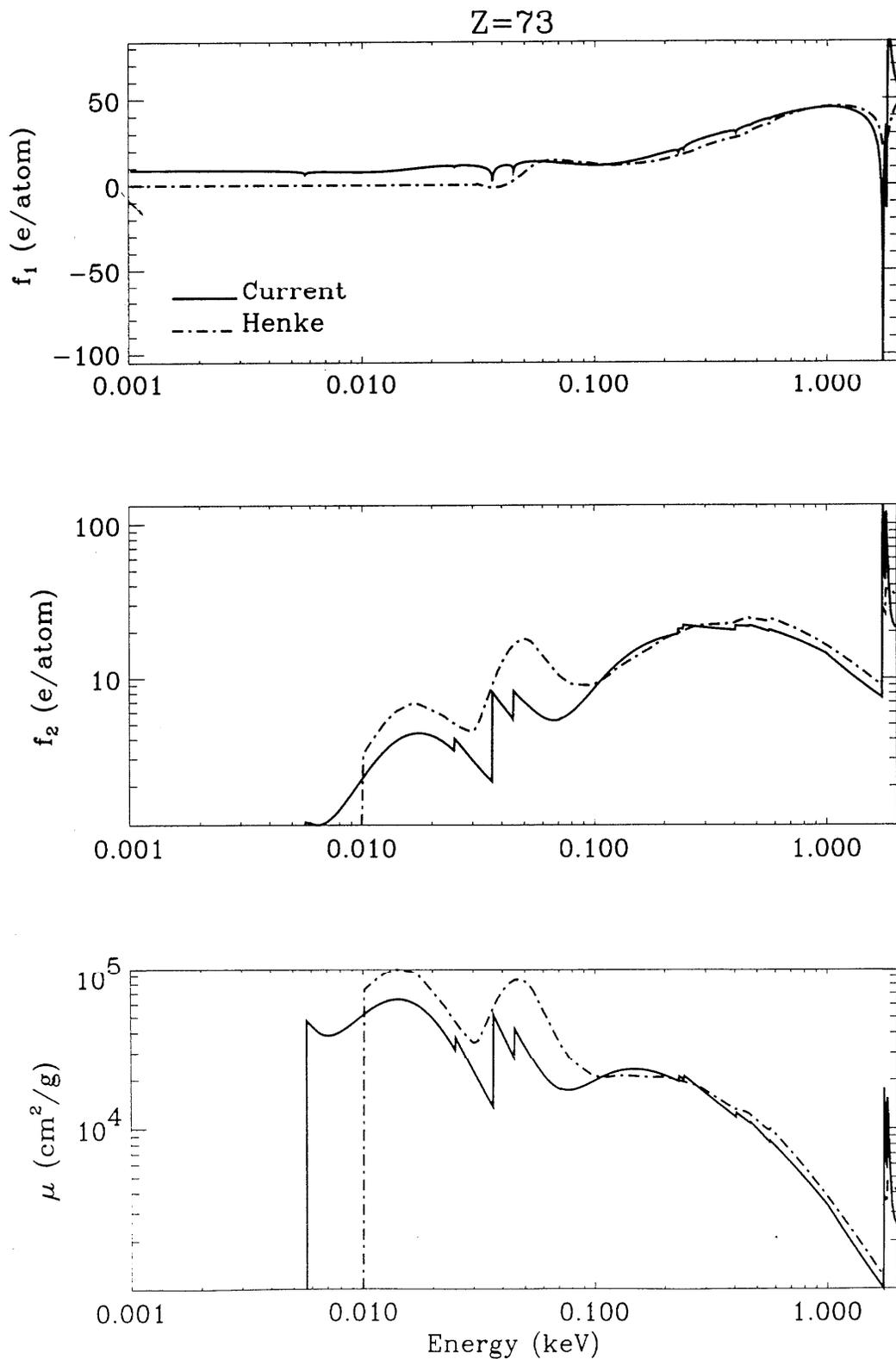
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 507

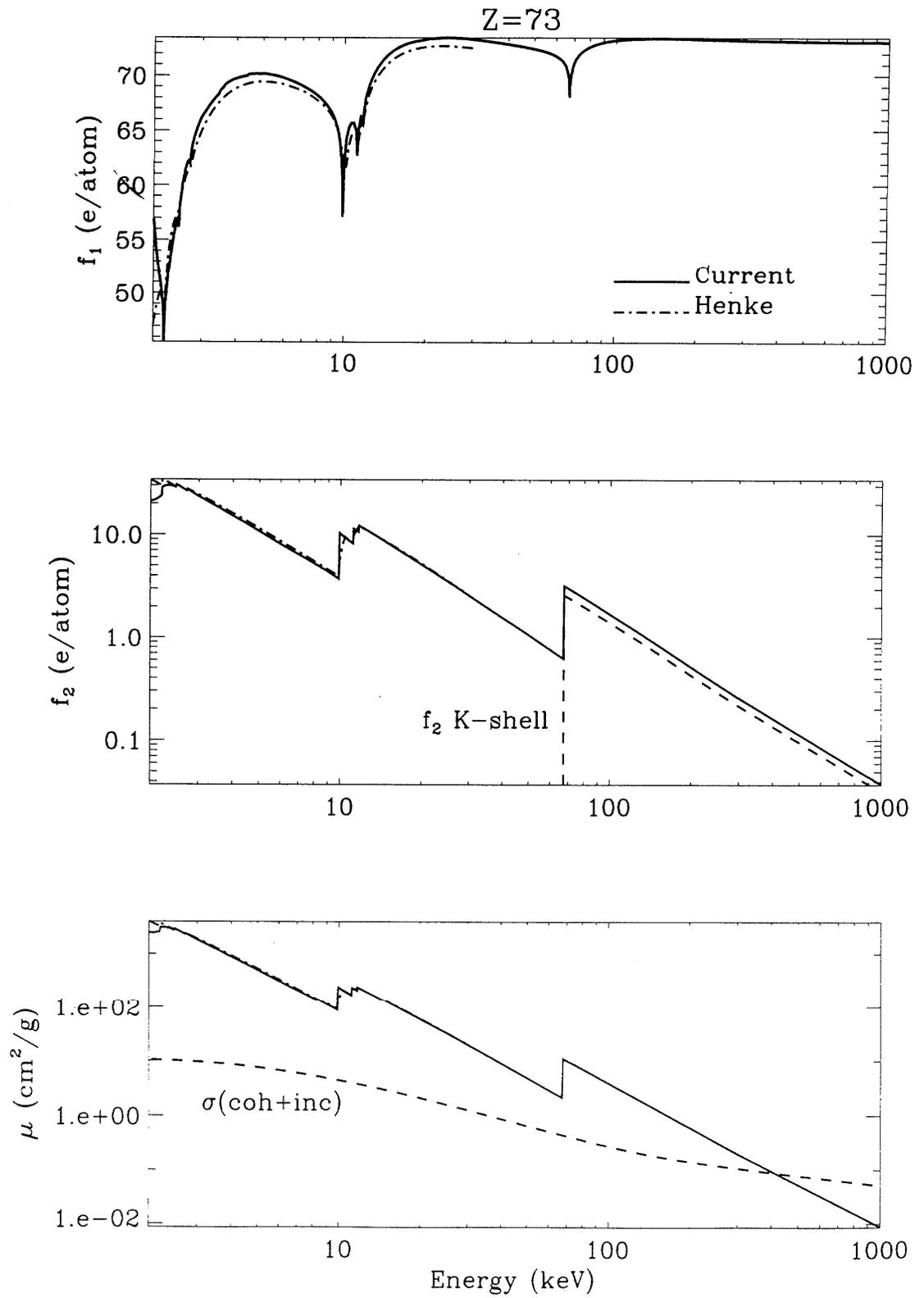
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
9.871219E+00	5.71434E+01	3.7453E+00	8.8234E+01	4.5250E+00	0.000E+00	1.256E-01
9.930505E+00	6.05654E+01	1.0348E+01	2.4233E+02	4.4997E+00	0.000E+00	1.249E-01
1.007872E+01	6.35612E+01	1.0006E+01	2.3087E+02	4.4377E+00	0.000E+00	1.230E-01
1.032004E+01	6.50977E+01	9.4836E+00	2.1371E+02	4.3395E+00	0.000E+00	1.201E-01
1.091338E+01	6.54822E+01	8.5087E+00	1.8131E+02	4.1121E+00	0.000E+00	1.136E-01
1.103212E+01	6.48825E+01	8.3416E+00	1.7584E+02	4.0688E+00	0.000E+00	1.124E-01
1.108042E+01	6.43050E+01	8.2758E+00	1.7369E+02	4.0514E+00	0.000E+00	1.119E-01
1.112496E+01	6.27014E+01	8.2160E+00	1.7175E+02	4.0355E+00	0.000E+00	1.114E-01
1.119178E+01	6.44029E+01	1.1357E+01	2.3599E+02	4.0118E+00	0.000E+00	1.108E-01
1.135882E+01	6.59310E+01	1.1070E+01	2.2664E+02	3.9534E+00	0.000E+00	1.092E-01
1.144787E+01	6.62523E+01	1.0923E+01	2.2189E+02	3.9229E+00	0.000E+00	1.083E-01
1.162309E+01	6.62303E+01	1.0644E+01	2.1297E+02	3.8638E+00	0.000E+00	1.067E-01
1.166982E+01	6.55306E+01	1.0572E+01	2.1069E+02	3.8483E+00	0.000E+00	1.062E-01
1.173991E+01	6.65825E+01	1.2137E+01	2.4041E+02	3.8252E+00	0.000E+00	1.056E-01
1.179334E+01	6.70814E+01	1.2053E+01	2.3768E+02	3.8078E+00	0.000E+00	1.051E-01
1.191513E+01	6.77871E+01	1.1867E+01	2.3162E+02	3.7685E+00	0.000E+00	1.041E-01
1.260708E+01	6.97701E+01	1.0898E+01	2.0103E+02	3.5570E+00	0.000E+00	9.834E-02
1.347697E+01	7.10512E+01	9.8172E+00	1.6940E+02	3.3168E+00	0.000E+00	9.200E-02
1.440688E+01	7.18606E+01	8.8261E+00	1.4247E+02	3.0874E+00	0.000E+00	8.606E-02
1.540095E+01	7.24049E+01	7.9175E+00	1.1955E+02	2.8691E+00	0.000E+00	8.050E-02
1.646362E+01	7.27659E+01	7.0951E+00	1.0022E+02	2.6619E+00	0.000E+00	7.531E-02
1.759961E+01	7.30023E+01	6.3589E+00	8.4024E+01	2.4659E+00	0.000E+00	7.045E-02
1.881398E+01	7.31523E+01	5.7019E+00	7.0480E+01	2.2809E+00	0.000E+00	6.590E-02
2.011215E+01	7.33039E+01	5.1142E+00	5.9135E+01	2.1068E+00	0.000E+00	6.165E-02
2.149988E+01	7.33452E+01	4.5840E+00	4.9583E+01	1.9434E+00	0.000E+00	5.767E-02
2.298338E+01	7.33888E+01	4.1096E+00	4.1583E+01	1.7905E+00	0.000E+00	5.395E-02
2.456923E+01	7.34025E+01	3.6801E+00	3.4833E+01	1.6476E+00	0.000E+00	5.046E-02
2.626450E+01	7.33713E+01	3.2969E+00	2.9192E+01	1.5146E+00	0.000E+00	4.721E-02
2.807676E+01	7.33311E+01	2.9320E+00	2.4285E+01	1.3909E+00	0.000E+00	4.416E-02
3.001405E+01	7.32561E+01	2.6027E+00	2.0166E+01	1.2762E+00	0.000E+00	4.131E-02
3.208502E+01	7.31674E+01	2.3123E+00	1.6759E+01	1.1702E+00	0.000E+00	3.864E-02
3.429889E+01	7.30703E+01	2.0559E+00	1.3940E+01	1.0722E+00	0.000E+00	3.615E-02
3.666551E+01	7.29671E+01	1.8295E+00	1.1604E+01	9.8201E-01	0.000E+00	3.381E-02
3.919543E+01	7.28589E+01	1.6292E+00	9.6663E+00	8.9907E-01	0.000E+00	3.163E-02
4.189992E+01	7.27455E+01	1.4520E+00	8.0587E+00	8.2296E-01	0.000E+00	2.959E-02
4.479101E+01	7.26247E+01	1.2929E+00	6.7128E+00	7.5326E-01	0.000E+00	2.768E-02
4.788159E+01	7.24914E+01	1.1512E+00	5.5913E+00	6.8954E-01	0.000E+00	2.589E-02
5.118542E+01	7.23388E+01	1.0236E+00	4.6506E+00	6.3138E-01	0.000E+00	2.422E-02
5.471721E+01	7.21497E+01	9.0721E-01	3.8557E+00	5.7839E-01	0.000E+00	2.266E-02
5.849270E+01	7.18904E+01	8.0445E-01	3.1983E+00	5.3018E-01	0.000E+00	2.120E-02
6.252870E+01	7.14546E+01	7.1341E-01	2.6533E+00	4.8638E-01	0.000E+00	1.983E-02
6.606807E+01	7.04835E+01	6.4647E-01	2.2755E+00	4.5332E-01	0.000E+00	1.877E-02
6.684318E+01	6.98055E+01	6.3316E-01	2.2028E+00	4.4665E-01	0.000E+00	1.855E-02
6.707932E+01	6.93757E+01	6.2919E-01	2.1813E+00	4.4466E-01	0.000E+00	1.848E-02
6.734898E+01	6.80495E+01	6.2470E-01	2.1571E+00	4.4240E-01	0.000E+00	1.841E-02
6.775348E+01	6.93893E+01	3.2286E+00	1.1082E+01	4.3906E-01	8.960E+00	1.830E-02
6.876473E+01	7.05993E+01	3.1573E+00	1.0678E+01	4.3092E-01	8.642E+00	1.803E-02
7.145536E+01	7.15926E+01	2.9775E+00	9.6904E+00	4.1064E-01	7.860E+00	1.735E-02
7.638578E+01	7.23062E+01	2.6741E+00	8.1411E+00	3.7805E-01	6.619E+00	1.623E-02
8.165640E+01	7.26821E+01	2.3979E+00	6.8291E+00	3.4857E-01	5.566E+00	1.518E-02
8.729069E+01	7.29153E+01	2.1482E+00	5.7232E+00	3.2193E-01	4.681E+00	1.420E-02
9.331374E+01	7.30695E+01	1.9189E+00	4.7823E+00	2.9787E-01	3.921E+00	1.329E-02
9.975239E+01	7.31707E+01	1.7140E+00	3.9959E+00	2.7615E-01	3.284E+00	1.243E-02
1.066353E+02	7.32373E+01	1.5312E+00	3.3392E+00	2.5655E-01	2.751E+00	1.163E-02
1.139931E+02	7.32801E+01	1.3680E+00	2.7909E+00	2.3885E-01	2.304E+00	1.088E-02
1.218587E+02	7.33060E+01	1.2224E+00	2.3328E+00	2.2287E-01	1.929E+00	1.017E-02
1.302669E+02	7.33200E+01	1.0924E+00	1.9502E+00	2.0843E-01	1.616E+00	9.518E-03
1.392553E+02	7.33528E+01	9.7465E-01	1.6277E+00	1.9538E-01	1.350E+00	8.903E-03
1.488640E+02	7.33493E+01	8.6801E-01	1.3560E+00	1.8356E-01	1.126E+00	8.329E-03
1.591356E+02	7.33401E+01	7.7311E-01	1.1298E+00	1.7284E-01	9.389E-01	7.791E-03
1.701159E+02	7.33273E+01	6.8866E-01	9.4142E-01	1.6311E-01	7.829E-01	7.288E-03
1.818539E+02	7.33121E+01	6.1349E-01	7.8453E-01	1.5425E-01	6.527E-01	6.818E-03
1.944018E+02	7.32954E+01	5.4657E-01	6.5384E-01	1.4617E-01	5.443E-01	6.378E-03
2.078156E+02	7.32778E+01	4.8699E-01	5.4497E-01	1.3878E-01	4.538E-01	5.966E-03
2.221548E+02	7.32599E+01	4.3395E-01	4.5427E-01	1.3200E-01	3.784E-01	5.581E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
2.374835E+02	7.32420E+01	3.8672E-01	3.7869E-01	1.2575E-01	3.155E-01	5.221E-03
2.538699E+02	7.32244E+01	3.4465E-01	3.1572E-01	1.1998E-01	2.631E-01	4.884E-03
2.713869E+02	7.32072E+01	3.0719E-01	2.6323E-01	1.1463E-01	2.194E-01	4.569E-03
2.901126E+02	7.31903E+01	2.7382E-01	2.1949E-01	1.0964E-01	1.829E-01	4.274E-03
3.101304E+02	7.31743E+01	2.4570E-01	1.8424E-01	1.0499E-01	1.537E-01	3.998E-03
3.315294E+02	7.31599E+01	2.2066E-01	1.5479E-01	1.0062E-01	1.293E-01	3.740E-03
3.544049E+02	7.31467E+01	1.9819E-01	1.3005E-01	9.6499E-02	1.088E-01	3.498E-03
3.788588E+02	7.31345E+01	1.7802E-01	1.0928E-01	9.2607E-02	9.150E-02	3.273E-03
4.050001E+02	7.31233E+01	1.5992E-01	9.1825E-02	8.8913E-02	7.697E-02	3.061E-03
4.329451E+02	7.31130E+01	1.4366E-01	7.7167E-02	8.5395E-02	6.475E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 511

W Z = 74

Atomic weight = 1.838500E+02 g/mol, nominal density ρ (g/cm³) = 1.9300E+01

μ_t (barns/atom) = $\mu(\text{cm}^2/\text{g}) \times 3.05290\text{E}+02$, E (eV) $\mu(\text{cm}^2/\text{g}) = f_2(\text{e}/\text{atom}) \times 2.28884\text{E}+05$

20 edges. Edge energies (keV):

K		6.95250E+00	L	I	1.20998E+00	L	II	1.15440E+00	L	III	1.02068E+01
M	I	2.81960E+00	M	II	2.57490E+00	M	III	2.28100E+00	M	IV	1.87160E+00
M	V	1.80920E+00	N	I	5.95000E-00	N	II	4.91600E-00	N	III	4.25300E-01
N	IV	2.58800E-00	N	V	2.45400E-00	O	I	3.65000E-02	O	II	3.36000E-02
O	III	7.71000E-02	N	VI	4.68000E-02	N	VII	3.56000E-02	O	IV	6.10000E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.4515E+00, -8.5980E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.6340E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
5.978000E-03	6.65660E+00	0.0000E+00	0.0000E+00	1.6514E-05	0.000E+00	2.074E+02
6.069500E-03	6.08378E+00	0.0000E+00	0.0000E+00	1.7873E-05	0.000E+00	2.043E+02
6.093900E-03	5.43188E+00	0.0000E+00	0.0000E+00	1.8250E-05	0.000E+00	2.035E+02
6.130500E-03	6.07665E+00	1.2640E+00	4.7191E+04	1.8826E-05	0.000E+00	2.022E+02
6.222000E-03	6.61931E+00	1.2569E+00	4.6237E+04	2.0328E-05	0.000E+00	1.993E+02
1.069000E-02	6.56496E+00	2.8092E+00	6.0149E+04	2.8121E-04	0.000E+00	1.160E+02
1.142761E-02	6.58098E+00	3.3151E+00	6.6397E+04	3.7980E-04	0.000E+00	1.085E+02
1.221612E-02	6.68973E+00	3.8688E+00	7.2486E+04	5.1038E-04	0.000E+00	1.015E+02
1.305903E-02	6.90985E+00	4.4462E+00	7.7928E+04	6.8243E-04	0.000E+00	9.494E+01
1.396010E-02	7.25243E+00	5.0157E+00	8.2236E+04	9.0794E-04	0.000E+00	8.881E+01
1.492335E-02	7.71790E+00	5.5412E+00	8.4987E+04	1.2020E-03	0.000E+00	8.308E+01
1.595306E-02	8.29414E+00	5.9859E+00	8.5881E+04	1.5836E-03	0.000E+00	7.772E+01
1.705382E-02	8.95658E+00	6.3173E+00	8.4786E+04	2.0761E-03	0.000E+00	7.270E+01
1.823053E-02	9.67031E+00	6.5117E+00	8.1755E+04	2.7085E-03	0.000E+00	6.801E+01
1.948844E-02	1.04305E+01	6.5573E+00	7.7013E+04	3.5167E-03	0.000E+00	6.362E+01
2.083314E-02	1.11203E+01	6.4550E+00	7.0918E+04	4.5440E-03	0.000E+00	5.951E+01
2.227063E-02	1.17349E+01	6.2179E+00	6.3904E+04	5.8436E-03	0.000E+00	5.567E+01
2.380730E-02	1.22377E+01	5.8684E+00	5.6419E+04	7.4793E-03	0.000E+00	5.208E+01
2.545001E-02	1.25975E+01	5.4333E+00	4.8864E+04	9.5279E-03	0.000E+00	4.872E+01
2.720606E-02	1.27802E+01	4.9392E+00	4.1553E+04	1.2081E-02	0.000E+00	4.557E+01
2.908327E-02	1.27425E+01	4.4187E+00	3.4775E+04	1.5247E-02	0.000E+00	4.263E+01
3.109002E-02	1.23960E+01	3.8996E+00	2.8709E+04	1.9154E-02	0.000E+00	3.988E+01
3.292800E-02	1.16002E+01	3.4700E+00	2.4120E+04	2.3224E-02	0.000E+00	3.765E+01
3.323523E-02	1.13527E+01	3.4028E+00	2.3434E+04	2.3951E-02	0.000E+00	3.731E+01
3.343200E-02	1.11252E+01	3.3604E+00	2.3006E+04	2.4424E-02	0.000E+00	3.709E+01
3.356640E-02	1.08065E+01	3.3318E+00	2.2719E+04	2.4750E-02	0.000E+00	3.694E+01
3.376800E-02	1.09013E+01	3.7405E+00	2.5354E+04	2.5245E-02	0.000E+00	3.672E+01
3.427200E-02	1.06426E+01	3.6194E+00	2.4172E+04	2.6506E-02	0.000E+00	3.618E+01
3.488800E-02	9.79398E+00	3.4773E+00	2.2813E+04	2.8099E-02	0.000E+00	3.554E+01
3.542200E-02	7.64986E+00	3.3593E+00	2.1707E+04	2.9525E-02	0.000E+00	3.500E+01
3.552846E-02	6.18367E+00	3.3363E+00	2.1494E+04	2.9814E-02	0.000E+00	3.490E+01
3.556440E-02	5.04927E+00	3.3286E+00	2.1422E+04	2.9912E-02	0.000E+00	3.486E+01
3.577000E-02	7.68767E+00	8.4061E+00	5.3789E+04	3.0476E-02	0.000E+00	3.466E+01
3.577800E-02	7.76490E+00	8.4024E+00	5.3753E+04	3.0499E-02	0.000E+00	3.465E+01
3.631750E-02	1.00580E+01	8.1578E+00	5.1413E+04	3.2010E-02	0.000E+00	3.414E+01
3.646350E-02	1.02313E+01	8.0933E+00	5.0802E+04	3.2427E-02	0.000E+00	3.400E+01
3.668250E-02	1.07991E+01	8.3052E+00	5.1821E+04	3.3058E-02	0.000E+00	3.380E+01
3.723000E-02	1.16701E+01	8.0634E+00	4.9573E+04	3.4667E-02	0.000E+00	3.330E+01
3.797993E-02	1.23990E+01	7.7505E+00	4.6708E+04	3.6944E-02	0.000E+00	3.264E+01
4.060054E-02	1.36087E+01	6.7833E+00	3.8241E+04	4.5572E-02	0.000E+00	3.054E+01
4.340198E-02	1.38839E+01	5.8781E+00	3.0999E+04	5.5965E-02	0.000E+00	2.857E+01
4.586400E-02	1.31951E+01	5.2040E+00	2.5971E+04	6.6105E-02	0.000E+00	2.703E+01
4.639671E-02	1.25737E+01	5.0734E+00	2.5028E+04	6.8423E-02	0.000E+00	2.672E+01
4.656600E-02	1.21538E+01	5.0330E+00	2.4738E+04	6.9169E-02	0.000E+00	2.663E+01
4.675320E-02	1.08814E+01	4.9889E+00	2.4424E+04	6.9999E-02	0.000E+00	2.652E+01
4.703400E-02	1.22052E+01	7.4381E+00	3.6197E+04	7.1254E-02	0.000E+00	2.636E+01
4.773600E-02	1.33694E+01	7.2554E+00	3.4788E+04	7.4446E-02	0.000E+00	2.597E+01
4.959809E-02	1.43109E+01	6.8159E+00	3.1454E+04	8.3285E-02	0.000E+00	2.500E+01
5.302035E-02	1.49342E+01	6.1523E+00	2.6559E+04	1.0093E-01	0.000E+00	2.338E+01
5.667876E-02	1.51540E+01	5.5407E+00	2.2375E+04	1.2178E-01	0.000E+00	2.187E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.058959E-02	1.51050E+01	5.0115E+00	1.8932E+04	1.4630E-01	0.000E+00	2.046E+01
6.477028E-02	1.48547E+01	4.6086E+00	1.6286E+04	1.7501E-01	0.000E+00	1.914E+01
6.923942E-02	1.44550E+01	4.3611E+00	1.4416E+04	2.0845E-01	0.000E+00	1.791E+01
7.401695E-02	1.39447E+01	4.2864E+00	1.3255E+04	2.4723E-01	0.000E+00	1.675E+01
7.555800E-02	1.37648E+01	4.2998E+00	1.3025E+04	2.6039E-01	0.000E+00	1.641E+01
7.671450E-02	1.36117E+01	4.3209E+00	1.2892E+04	2.7046E-01	0.000E+00	1.616E+01
7.702290E-02	1.35465E+01	4.3281E+00	1.2862E+04	2.7318E-01	0.000E+00	1.610E+01
7.748550E-02	1.35269E+01	4.4018E+00	1.3002E+04	2.7727E-01	0.000E+00	1.600E+01
7.864200E-02	1.34278E+01	4.4392E+00	1.2920E+04	2.8763E-01	0.000E+00	1.577E+01
7.912411E-02	1.33807E+01	4.4574E+00	1.2894E+04	2.9200E-01	0.000E+00	1.567E+01
8.458368E-02	1.28282E+01	4.7586E+00	1.2877E+04	3.4342E-01	0.000E+00	1.466E+01
9.041995E-02	1.22717E+01	5.2496E+00	1.3288E+04	4.0222E-01	0.000E+00	1.371E+01
9.665893E-02	1.17538E+01	5.9297E+00	1.4041E+04	4.6915E-01	0.000E+00	1.283E+01
1.033284E-01	1.12287E+01	6.7945E+00	1.5051E+04	5.4497E-01	0.000E+00	1.200E+01
1.104581E-01	1.08056E+01	7.8345E+00	1.6234E+04	6.3048E-01	0.000E+00	1.122E+01
1.180797E-01	1.06173E+01	9.0377E+00	1.7519E+04	7.2645E-01	0.000E+00	1.050E+01
1.262272E-01	1.06133E+01	1.0381E+01	1.8824E+04	8.3368E-01	0.000E+00	9.822E+00
1.349368E-01	1.08294E+01	1.1829E+01	2.0065E+04	9.5292E-01	0.000E+00	9.188E+00
1.442475E-01	1.12973E+01	1.3325E+01	2.1144E+04	1.0849E+00	0.000E+00	8.595E+00
1.542005E-01	1.20170E+01	1.4801E+01	2.1970E+04	1.2303E+00	0.000E+00	8.040E+00
1.648404E-01	1.29656E+01	1.6195E+01	2.2486E+04	1.3898E+00	0.000E+00	7.521E+00
1.762144E-01	1.41061E+01	1.7466E+01	2.2686E+04	1.5639E+00	0.000E+00	7.036E+00
1.883732E-01	1.53958E+01	1.8586E+01	2.2583E+04	1.7531E+00	0.000E+00	6.582E+00
2.013709E-01	1.67865E+01	1.9538E+01	2.2207E+04	1.9577E+00	0.000E+00	6.157E+00
2.152655E-01	1.82203E+01	2.0313E+01	2.1598E+04	2.1778E+00	0.000E+00	5.760E+00
2.301188E-01	1.96033E+01	2.0913E+01	2.0801E+04	2.4137E+00	0.000E+00	5.388E+00
2.404920E-01	2.03108E+01	2.1217E+01	2.0193E+04	2.5781E+00	0.000E+00	5.155E+00
2.441730E-01	2.02295E+01	2.1306E+01	1.9971E+04	2.6363E+00	0.000E+00	5.078E+00
2.451546E-01	1.97929E+01	2.1327E+01	1.9912E+04	2.6518E+00	0.000E+00	5.057E+00
2.459970E-01	2.01707E+01	2.2395E+01	2.0837E+04	2.6651E+00	0.000E+00	5.040E+00
2.466270E-01	2.04700E+01	2.2403E+01	2.0792E+04	2.6750E+00	0.000E+00	5.027E+00
2.503080E-01	2.12399E+01	2.2439E+01	2.0518E+04	2.7331E+00	0.000E+00	4.953E+00
2.536240E-01	2.16361E+01	2.2462E+01	2.0271E+04	2.7853E+00	0.000E+00	4.889E+00
2.575060E-01	2.18142E+01	2.2479E+01	1.9980E+04	2.8463E+00	0.000E+00	4.815E+00
2.585412E-01	2.15387E+01	2.2481E+01	1.9902E+04	2.8625E+00	0.000E+00	4.796E+00
2.600940E-01	2.21453E+01	2.3280E+01	2.0486E+04	2.8868E+00	0.000E+00	4.767E+00
2.629708E-01	2.27879E+01	2.3271E+01	2.0255E+04	2.9319E+00	0.000E+00	4.715E+00
2.639760E-01	2.29589E+01	2.3267E+01	2.0174E+04	2.9476E+00	0.000E+00	4.697E+00
2.811158E-01	2.50671E+01	2.3127E+01	1.8830E+04	3.2135E+00	0.000E+00	4.410E+00
3.005128E-01	2.68202E+01	2.2886E+01	1.7431E+04	3.5094E+00	0.000E+00	4.126E+00
3.212482E-01	2.83521E+01	2.2590E+01	1.6095E+04	3.8187E+00	0.000E+00	3.859E+00
3.434143E-01	2.97150E+01	2.2244E+01	1.4825E+04	4.1404E+00	0.000E+00	3.610E+00
3.671099E-01	3.09092E+01	2.1860E+01	1.3629E+04	4.4733E+00	0.000E+00	3.377E+00
3.924405E-01	3.18877E+01	2.1455E+01	1.2513E+04	4.8160E+00	0.000E+00	3.159E+00
4.167940E-01	3.22967E+01	2.1080E+01	1.1576E+04	5.1322E+00	0.000E+00	2.975E+00
4.195189E-01	3.22254E+01	2.1040E+01	1.1479E+04	5.1668E+00	0.000E+00	2.955E+00
4.231735E-01	3.19055E+01	2.0986E+01	1.1351E+04	5.2129E+00	0.000E+00	2.930E+00
4.248747E-01	3.12312E+01	2.0960E+01	1.1292E+04	5.2343E+00	0.000E+00	2.918E+00
4.274265E-01	3.20590E+01	2.2364E+01	1.1976E+04	5.2662E+00	0.000E+00	2.901E+00
4.338060E-01	3.29227E+01	2.2282E+01	1.1756E+04	5.3454E+00	0.000E+00	2.858E+00
4.484657E-01	3.38871E+01	2.2098E+01	1.1278E+04	5.5240E+00	0.000E+00	2.765E+00
4.794098E-01	3.51886E+01	2.1730E+01	1.0375E+04	5.8856E+00	0.000E+00	2.586E+00
4.817680E-01	3.52599E+01	2.1703E+01	1.0311E+04	5.9123E+00	0.000E+00	2.574E+00
4.891420E-01	3.53929E+01	2.1619E+01	1.0116E+04	5.9950E+00	0.000E+00	2.535E+00
4.911084E-01	3.52862E+01	2.1597E+01	1.0065E+04	6.0169E+00	0.000E+00	2.525E+00
4.940580E-01	3.55772E+01	2.1919E+01	1.0154E+04	6.0496E+00	0.000E+00	2.510E+00
5.014320E-01	3.60042E+01	2.1841E+01	9.9696E+03	6.1304E+00	0.000E+00	2.473E+00
5.124891E-01	3.64803E+01	2.1726E+01	9.7031E+03	6.2495E+00	0.000E+00	2.419E+00
5.478508E-01	3.77275E+01	2.1366E+01	8.9263E+03	6.6135E+00	0.000E+00	2.263E+00
5.831000E-01	3.86721E+01	2.1011E+01	8.2473E+03	6.9518E+00	0.000E+00	2.126E+00
5.856525E-01	3.87122E+01	2.0985E+01	8.2013E+03	6.9753E+00	0.000E+00	2.117E+00
5.920250E-01	3.87184E+01	2.0921E+01	8.0882E+03	7.0337E+00	0.000E+00	2.094E+00
5.944050E-01	3.85193E+01	2.0897E+01	8.0466E+03	7.0553E+00	0.000E+00	2.086E+00
5.979750E-01	3.89020E+01	2.1394E+01	8.1888E+03	7.0874E+00	0.000E+00	2.073E+00
6.069000E-01	3.94099E+01	2.1306E+01	8.0353E+03	7.1669E+00	0.000E+00	2.043E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 513

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
6.260625E-01	4.01457E+01	2.1117E+01	7.7201E+03	7.3326E+00	0.000E+00	1.980E+00
6.692609E-01	4.14878E+01	2.0482E+01	7.0048E+03	7.6828E+00	0.000E+00	1.853E+00
7.154399E-01	4.26536E+01	1.9697E+01	6.3015E+03	8.0234E+00	0.000E+00	1.733E+00
7.648052E-01	4.36517E+01	1.8829E+01	5.6351E+03	8.3522E+00	0.000E+00	1.621E+00
8.175768E-01	4.44791E+01	1.7956E+01	5.0268E+03	8.6665E+00	0.000E+00	1.516E+00
8.739896E-01	4.51435E+01	1.7081E+01	4.4733E+03	8.9642E+00	0.000E+00	1.419E+00
9.342948E-01	4.56622E+01	1.6215E+01	3.9725E+03	9.2430E+00	0.000E+00	1.327E+00
9.987612E-01	4.60542E+01	1.5368E+01	3.5220E+03	9.5008E+00	0.000E+00	1.241E+00
1.067676E+00	4.67407E+01	1.4114E+01	3.0257E+03	9.7356E+00	0.000E+00	1.161E+00
1.141345E+00	4.65249E+01	1.2941E+01	2.5952E+03	9.9458E+00	0.000E+00	1.086E+00
1.220098E+00	4.60542E+01	1.1897E+01	2.2319E+03	1.0130E+01	0.000E+00	1.016E+00
1.304285E+00	4.49247E+01	1.0965E+01	1.9242E+03	1.0286E+01	0.000E+00	9.506E-01
1.394281E+00	4.33609E+01	1.0131E+01	1.6631E+03	1.0414E+01	0.000E+00	8.892E-01
1.490486E+00	4.08763E+01	9.3830E+00	1.4409E+03	1.0513E+01	0.000E+00	8.318E-01
1.593329E+00	3.64706E+01	8.7099E+00	1.2512E+03	1.0581E+01	0.000E+00	7.781E-01
1.703269E+00	2.60550E+01	8.1031E+00	1.0889E+03	1.0620E+01	0.000E+00	7.279E-01
1.773016E+00	3.78031E+00	7.7515E+00	1.0007E+03	1.0628E+01	0.000E+00	6.993E-01
1.800154E+00	-3.71802E+01	7.6238E+00	9.6934E+02	1.0628E+01	0.000E+00	6.887E-01
1.807391E+00	-1.00502E+02	7.5906E+00	9.6125E+02	1.0628E+01	0.000E+00	6.860E-01
1.818246E+00	-1.28899E-01	1.3069E+02	1.6451E+04	1.0628E+01	0.000E+00	6.819E-01
1.820795E+00	1.27312E+01	1.2293E+02	1.5453E+04	1.0628E+01	0.000E+00	6.809E-01
1.834168E+00	4.35023E+01	8.9683E+01	1.1192E+04	1.0627E+01	0.000E+00	6.760E-01
1.845384E+00	4.80820E+01	6.9400E+01	8.6078E+03	1.0626E+01	0.000E+00	6.719E-01
1.862242E+00	3.16484E+01	4.8014E+01	5.9013E+03	1.0624E+01	0.000E+00	6.658E-01
1.869728E+00	-1.05038E+01	4.1083E+01	5.0292E+03	1.0623E+01	0.000E+00	6.631E-01
1.880958E+00	5.59203E+01	1.1508E+02	1.4004E+04	1.0621E+01	0.000E+00	6.592E-01
1.909032E+00	8.66328E+01	6.3286E+01	7.5876E+03	1.0615E+01	0.000E+00	6.495E-01
1.946430E+00	8.05339E+01	3.4515E+01	4.0587E+03	1.0606E+01	0.000E+00	6.370E-01
2.080733E+00	5.83224E+01	2.1257E+01	2.3383E+03	1.0554E+01	0.000E+00	5.959E-01
2.224304E+00	5.19555E+01	2.2588E+01	2.3243E+03	1.0474E+01	0.000E+00	5.574E-01
2.235380E+00	5.15483E+01	2.2792E+01	2.3337E+03	1.0467E+01	0.000E+00	5.546E-01
2.269595E+00	4.94023E+01	2.3451E+01	2.3650E+03	1.0445E+01	0.000E+00	5.463E-01
2.278719E+00	4.69848E+01	2.3632E+01	2.3737E+03	1.0438E+01	0.000E+00	5.441E-01
2.292405E+00	4.95181E+01	2.8687E+01	2.8642E+03	1.0429E+01	0.000E+00	5.408E-01
2.326620E+00	5.20675E+01	2.9190E+01	2.8716E+03	1.0405E+01	0.000E+00	5.329E-01
2.377781E+00	5.41934E+01	2.9622E+01	2.8514E+03	1.0366E+01	0.000E+00	5.214E-01
2.523402E+00	5.82505E+01	2.8928E+01	2.6239E+03	1.0248E+01	0.000E+00	4.913E-01
2.541848E+00	5.84876E+01	2.8705E+01	2.5848E+03	1.0232E+01	0.000E+00	4.878E-01
2.562025E+00	5.84474E+01	2.8442E+01	2.5410E+03	1.0214E+01	0.000E+00	4.839E-01
2.572325E+00	5.77400E+01	2.8301E+01	2.5182E+03	1.0205E+01	0.000E+00	4.820E-01
2.587774E+00	5.90695E+01	2.9956E+01	2.6496E+03	1.0192E+01	0.000E+00	4.791E-01
2.626398E+00	6.07425E+01	2.9300E+01	2.5535E+03	1.0157E+01	0.000E+00	4.721E-01
2.717235E+00	6.27552E+01	2.7681E+01	2.3317E+03	1.0072E+01	0.000E+00	4.563E-01
2.763208E+00	6.33382E+01	2.6900E+01	2.2282E+03	1.0028E+01	0.000E+00	4.487E-01
2.805502E+00	6.34575E+01	2.6202E+01	2.1377E+03	9.9874E+00	0.000E+00	4.419E-01
2.816781E+00	6.30245E+01	2.6020E+01	2.1143E+03	9.9763E+00	0.000E+00	4.402E-01
2.833698E+00	6.38157E+01	2.6887E+01	2.1717E+03	9.9597E+00	0.000E+00	4.375E-01
2.875992E+00	6.47965E+01	2.6224E+01	2.0870E+03	9.9177E+00	0.000E+00	4.311E-01
2.904724E+00	6.52287E+01	2.5792E+01	2.0323E+03	9.8890E+00	0.000E+00	4.268E-01
3.105150E+00	6.70066E+01	2.3284E+01	1.7163E+03	9.6836E+00	0.000E+00	3.993E-01
3.319406E+00	6.82667E+01	2.1143E+01	1.4578E+03	9.4581E+00	0.000E+00	3.735E-01
3.548445E+00	6.91871E+01	1.9196E+01	1.2382E+03	9.2143E+00	0.000E+00	3.494E-01
3.793288E+00	7.02181E+01	1.7360E+01	1.0475E+03	8.9542E+00	0.000E+00	3.269E-01
4.055024E+00	7.06313E+01	1.5650E+01	8.8336E+02	8.6798E+00	0.000E+00	3.058E-01
4.334821E+00	7.08697E+01	1.4139E+01	7.4653E+02	8.3931E+00	0.000E+00	2.860E-01
4.633924E+00	7.11122E+01	1.2784E+01	6.3146E+02	8.0963E+00	0.000E+00	2.676E-01
4.953664E+00	7.11475E+01	1.1526E+01	5.3255E+02	7.7914E+00	0.000E+00	2.503E-01
5.295467E+00	7.11450E+01	1.0392E+01	4.4918E+02	7.4803E+00	0.000E+00	2.341E-01
5.660855E+00	7.10404E+01	9.3697E+00	3.7884E+02	7.1649E+00	0.000E+00	2.190E-01
6.051453E+00	7.08546E+01	8.4516E+00	3.1967E+02	6.8471E+00	0.000E+00	2.049E-01
6.469004E+00	7.06120E+01	7.6347E+00	2.7013E+02	6.5287E+00	0.000E+00	1.917E-01
6.915365E+00	7.03157E+01	6.9068E+00	2.2860E+02	6.2113E+00	0.000E+00	1.793E-01
7.392525E+00	6.99589E+01	6.2574E+00	1.9374E+02	5.8965E+00	0.000E+00	1.677E-01
7.902609E+00	6.95221E+01	5.6752E+00	1.6437E+02	5.5856E+00	0.000E+00	1.569E-01
8.447890E+00	6.89513E+01	5.1320E+00	1.3904E+02	5.2800E+00	0.000E+00	1.468E-01

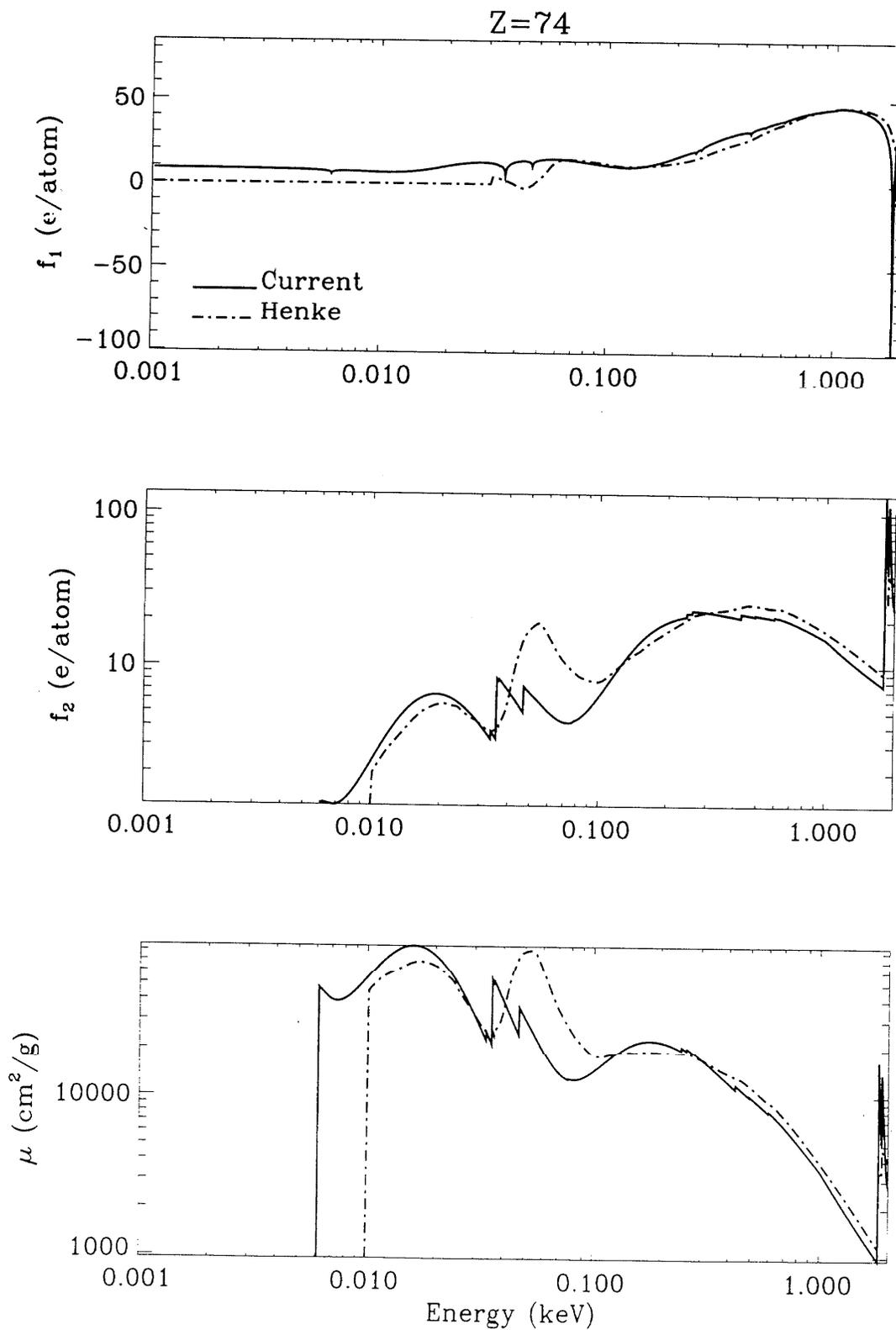
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

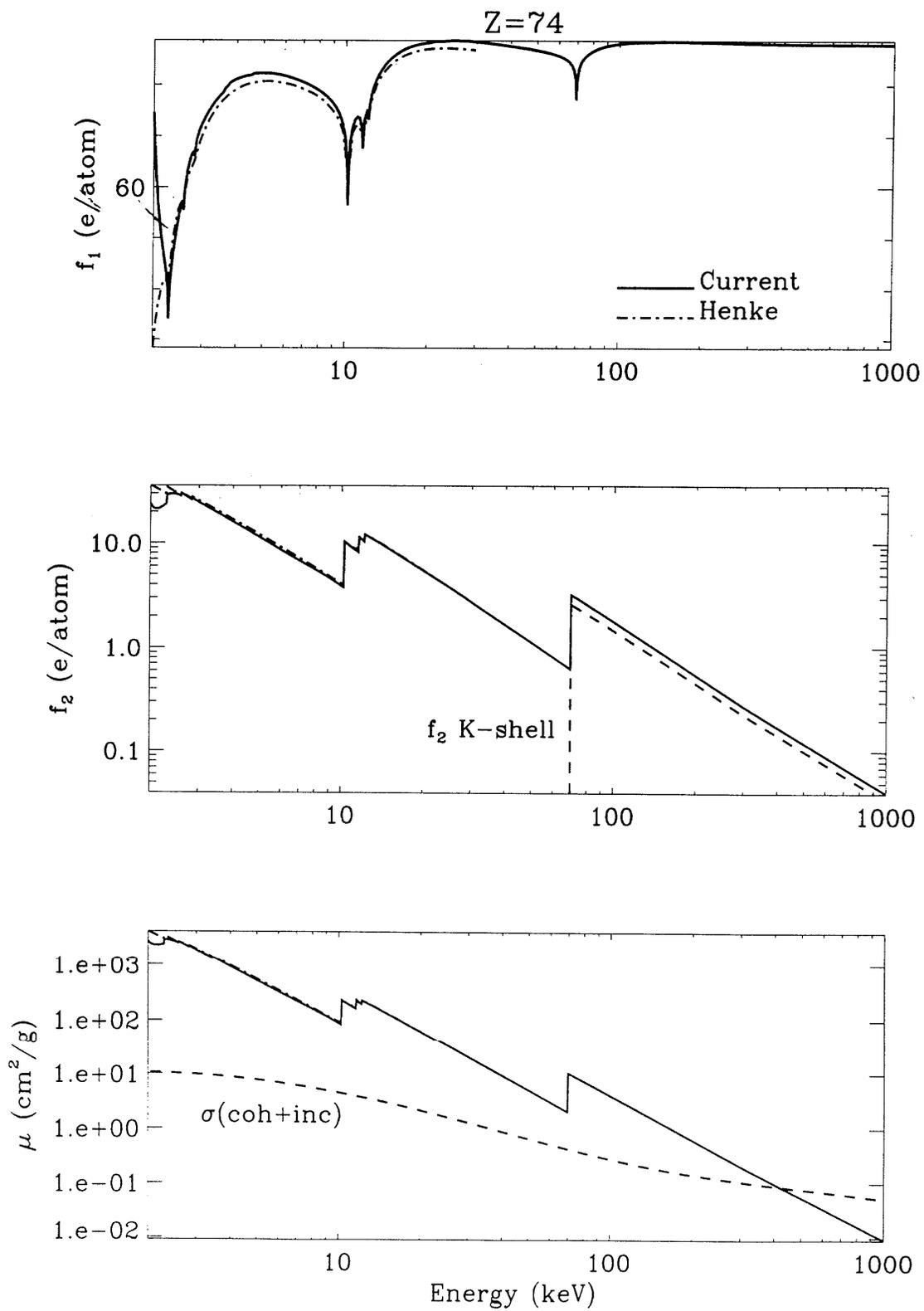
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
9.030794E+00	6.81293E+01	4.6283E+00	1.1730E+02	4.9808E+00	0.000E+00	1.373E-01
9.653919E+00	6.65592E+01	4.1268E+00	9.7842E+01	4.6891E+00	0.000E+00	1.284E-01
1.000266E+01	6.45033E+01	3.8823E+00	8.8837E+01	4.5373E+00	0.000E+00	1.240E-01
1.015577E+01	6.16346E+01	3.7802E+00	8.5196E+01	4.4730E+00	0.000E+00	1.221E-01
1.019659E+01	5.82555E+01	3.7538E+00	8.4261E+01	4.4562E+00	0.000E+00	1.216E-01
1.025783E+01	6.16606E+01	1.0324E+01	2.3035E+02	4.4310E+00	0.000E+00	1.209E-01
1.032004E+01	6.33883E+01	1.0184E+01	2.2587E+02	4.4057E+00	0.000E+00	1.201E-01
1.041094E+01	6.46451E+01	9.9850E+00	2.1952E+02	4.3691E+00	0.000E+00	1.191E-01
1.103212E+01	6.68651E+01	8.8485E+00	1.8358E+02	4.1314E+00	0.000E+00	1.124E-01
1.131312E+01	6.65940E+01	8.4442E+00	1.7084E+02	4.0305E+00	0.000E+00	1.096E-01
1.148628E+01	6.54086E+01	8.2142E+00	1.6368E+02	3.9703E+00	0.000E+00	1.079E-01
1.153246E+01	6.38067E+01	8.1551E+00	1.6185E+02	3.9545E+00	0.000E+00	1.075E-01
1.160172E+01	6.55005E+01	1.1288E+01	2.2269E+02	3.9309E+00	0.000E+00	1.069E-01
1.177488E+01	6.70136E+01	1.1001E+01	2.1384E+02	3.8730E+00	0.000E+00	1.053E-01
1.179334E+01	6.70913E+01	1.0971E+01	2.1292E+02	3.8669E+00	0.000E+00	1.051E-01
1.185780E+01	6.73020E+01	1.0868E+01	2.0978E+02	3.8438E+00	0.000E+00	1.046E-01
1.203930E+01	6.72878E+01	1.0589E+01	2.0131E+02	3.7871E+00	0.000E+00	1.030E-01
1.208770E+01	6.65917E+01	1.0516E+01	1.9913E+02	3.7718E+00	0.000E+00	1.026E-01
1.216030E+01	6.76405E+01	1.2074E+01	2.2725E+02	3.7489E+00	0.000E+00	1.020E-01
1.234180E+01	6.88404E+01	1.1804E+01	2.1891E+02	3.6926E+00	0.000E+00	1.005E-01
1.260708E+01	6.97737E+01	1.1430E+01	2.0751E+02	3.6127E+00	0.000E+00	9.834E-02
1.347697E+01	7.14875E+01	1.0319E+01	1.7526E+02	3.3691E+00	0.000E+00	9.200E-02
1.440688E+01	7.24910E+01	9.2845E+00	1.4750E+02	3.1365E+00	0.000E+00	8.606E-02
1.540095E+01	7.31546E+01	8.3430E+00	1.2399E+02	2.9151E+00	0.000E+00	8.050E-02
1.646362E+01	7.36002E+01	7.4814E+00	1.0401E+02	2.7049E+00	0.000E+00	7.531E-02
1.759961E+01	7.38944E+01	6.7060E+00	8.7212E+01	2.5059E+00	0.000E+00	7.045E-02
1.881398E+01	7.40850E+01	6.0128E+00	7.3150E+01	2.3181E+00	0.000E+00	6.590E-02
2.011215E+01	7.42037E+01	5.3947E+00	6.1393E+01	2.1414E+00	0.000E+00	6.165E-02
2.149988E+01	7.43309E+01	4.8368E+00	5.1491E+01	1.9754E+00	0.000E+00	5.767E-02
2.298338E+01	7.43562E+01	4.3382E+00	4.3203E+01	1.8201E+00	0.000E+00	5.395E-02
2.456923E+01	7.44178E+01	3.8884E+00	3.6224E+01	1.6749E+00	0.000E+00	5.046E-02
2.626450E+01	7.43985E+01	3.4838E+00	3.0360E+01	1.5397E+00	0.000E+00	4.721E-02
2.807676E+01	7.43669E+01	3.0983E+00	2.5257E+01	1.4140E+00	0.000E+00	4.416E-02
3.001405E+01	7.42970E+01	2.7503E+00	2.0973E+01	1.2974E+00	0.000E+00	4.131E-02
3.208502E+01	7.42121E+01	2.4435E+00	1.7431E+01	1.1896E+00	0.000E+00	3.864E-02
3.429889E+01	7.41179E+01	2.1727E+00	1.4499E+01	1.0900E+00	0.000E+00	3.615E-02
3.666551E+01	7.40173E+01	1.9334E+00	1.2069E+01	9.9817E-01	0.000E+00	3.381E-02
3.919543E+01	7.39116E+01	1.7219E+00	1.0055E+01	9.1378E-01	0.000E+00	3.163E-02
4.189992E+01	7.38011E+01	1.5346E+00	8.3832E+00	8.3632E-01	0.000E+00	2.959E-02
4.479101E+01	7.36848E+01	1.3682E+00	6.9916E+00	7.6537E-01	0.000E+00	2.768E-02
4.788159E+01	7.35584E+01	1.2184E+00	5.8244E+00	7.0050E-01	0.000E+00	2.589E-02
5.118542E+01	7.34168E+01	1.0851E+00	4.8521E+00	6.4128E-01	0.000E+00	2.422E-02
5.471721E+01	7.32486E+01	9.6347E-01	4.0302E+00	5.8731E-01	0.000E+00	2.266E-02
5.849270E+01	7.30295E+01	8.5449E-01	3.3437E+00	5.3821E-01	0.000E+00	2.120E-02
6.252870E+01	7.27015E+01	7.5806E-01	2.7749E+00	4.9359E-01	0.000E+00	1.983E-02
6.684318E+01	7.20009E+01	6.7279E-01	2.3038E+00	4.5311E-01	0.000E+00	1.855E-02
6.813450E+01	7.15004E+01	6.5025E-01	2.1844E+00	4.4222E-01	0.000E+00	1.820E-02
6.917738E+01	7.03996E+01	6.3292E-01	2.0941E+00	4.3378E-01	0.000E+00	1.792E-02
6.945548E+01	6.90815E+01	6.2842E-01	2.0709E+00	4.3159E-01	0.000E+00	1.785E-02
6.987263E+01	7.04134E+01	3.2163E+00	1.0536E+01	4.2834E-01	8.499E+00	1.774E-02
7.091550E+01	7.16162E+01	3.1450E+00	1.0515E+01	4.2041E-01	8.196E+00	1.748E-02
7.145536E+01	7.19078E+01	3.1091E+00	9.9591E+00	4.1642E-01	8.045E+00	1.735E-02
7.638578E+01	7.30529E+01	2.7986E+00	8.3857E+00	3.8321E-01	6.794E+00	1.623E-02
8.165640E+01	7.35353E+01	2.5097E+00	7.0346E+00	3.5317E-01	5.714E+00	1.518E-02
8.729069E+01	7.38178E+01	2.2497E+00	5.8989E+00	3.2602E-01	4.809E+00	1.420E-02
9.331374E+01	7.40042E+01	2.0139E+00	4.9397E+00	3.0150E-01	4.039E+00	1.329E-02
9.975239E+01	7.41261E+01	1.7992E+00	4.1282E+00	2.7936E-01	3.384E+00	1.243E-02
1.066353E+02	7.42067E+01	1.6076E+00	3.4505E+00	2.5938E-01	2.835E+00	1.163E-02
1.139931E+02	7.42592E+01	1.4366E+00	2.8844E+00	2.4135E-01	2.375E+00	1.088E-02
1.218587E+02	7.42920E+01	1.2839E+00	2.4115E+00	2.2507E-01	1.989E+00	1.017E-02
1.302669E+02	7.43109E+01	1.1476E+00	2.0164E+00	2.1036E-01	1.667E+00	9.518E-03
1.392553E+02	7.43475E+01	1.0259E+00	1.6861E+00	1.9706E-01	1.396E+00	8.903E-03
1.488640E+02	7.43477E+01	9.1402E-01	1.4053E+00	1.8503E-01	1.165E+00	8.329E-03
1.591356E+02	7.43410E+01	8.1445E-01	1.1714E+00	1.7412E-01	9.715E-01	7.791E-03
1.701159E+02	7.43299E+01	7.2581E-01	9.7654E-01	1.6422E-01	8.105E-01	7.288E-03

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 515

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

<i>E</i> keV	<i>f</i> ₁ e/atom	<i>f</i> ₂ e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.818539E+02	7.43159E+01	6.4687E-01	8.1416E-01	1.5521E-01	6.762E-01	6.818E-03
1.944018E+02	7.43000E+01	5.7657E-01	6.7884E-01	1.4700E-01	5.641E-01	6.378E-03
2.078156E+02	7.42830E+01	5.1396E-01	5.6606E-01	1.3949E-01	4.706E-01	5.966E-03
2.221548E+02	7.42654E+01	4.5818E-01	4.7206E-01	1.3260E-01	3.926E-01	5.581E-03
2.374833E+02	7.42477E+01	4.0850E-01	3.9371E-01	1.2626E-01	3.275E-01	5.221E-03
2.538699E+02	7.42302E+01	3.6423E-01	3.2838E-01	1.2041E-01	2.732E-01	4.884E-03
2.713869E+02	7.42129E+01	3.2479E-01	2.7392E-01	1.1499E-01	2.279E-01	4.569E-03
2.901126E+02	7.41960E+01	2.8963E-01	2.2851E-01	1.0994E-01	1.901E-01	4.274E-03
3.101304E+02	7.41795E+01	2.5917E-01	1.9127E-01	1.0523E-01	1.593E-01	3.998E-03
3.315294E+02	7.41646E+01	2.3293E-01	1.6081E-01	1.0082E-01	1.341E-01	3.740E-03
3.544049E+02	7.41511E+01	2.0937E-01	1.3522E-01	9.6661E-02	1.129E-01	3.498E-03
3.788588E+02	7.41386E+01	1.8820E-01	1.1370E-01	9.2734E-02	9.505E-02	3.273E-03
4.050001E+02	7.41271E+01	1.6919E-01	9.5617E-02	8.9009E-02	8.003E-02	3.061E-03
4.329451E+02	7.41165E+01	1.5211E-01	8.0415E-02	8.5466E-02	6.738E-02	2.864E-03





Re Z = 75

Atomic weight = 1.862070E+02 g/mol, nominal density ρ (g/cm³) = 2.0980E+01 μ_a (barns/atom) = μ (cm²/g) \times 3.09204E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.25987E+05

2l edges. Edge energies (keV):

K		7.16764E+00	L	I	1.25267E+00	L	II	1.19587E+00	L	III	1.05353E+01
M	I	2.93170E+00	M	II	2.68160E+00	M	III	2.36730E+00	M	IV	1.94890E+00
M	V	1.88290E+00	N	I	6.25000E-00	N	II	5.17900E-00	N	III	4.44400E-01
N	IV	2.73700E-00	N	V	2.60200E-00	O	I	4.06000E-02	O	II	4.06000E-02
N	VI	-8.28000E-02	N	VII	4.56000E-02	O	III	3.46000E-02	O	IV	6.06267E-03
O	V	5.20913E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.5033E+00, -8.8920E-01 e/atomNuclear Thomson correction f_{NT} = -1.6572E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
5.104943E-03	6.39581E+00	0.0000E+00	0.0000E+00	7.3520E-06	0.000E+00	2.429E+02
5.183079E-03	6.22399E+00	0.0000E+00	0.0000E+00	7.9793E-06	0.000E+00	2.392E+02
5.203916E-03	6.06267E+00	0.0000E+00	0.0000E+00	8.1534E-06	0.000E+00	2.383E+02
5.235171E-03	6.19350E+00	2.9128E-01	1.2574E+04	8.4199E-06	0.000E+00	2.368E+02
5.313308E-03	6.27314E+00	2.9108E-01	1.2380E+04	9.1158E-06	0.000E+00	2.333E+02
5.941418E-03	5.68875E+00	2.9183E-01	1.1100E+04	1.6452E-05	0.000E+00	2.087E+02
6.032358E-03	5.20729E+00	2.9392E-01	1.1011E+04	1.7806E-05	0.000E+00	2.055E+02
6.056608E-03	4.66114E+00	2.9460E-01	1.0992E+04	1.8181E-05	0.000E+00	2.047E+02
6.092984E-03	5.19845E+00	1.3530E+00	5.0183E+04	1.8755E-05	0.000E+00	2.035E+02
6.183924E-03	5.64768E+00	1.3515E+00	4.9391E+04	2.0251E-05	0.000E+00	2.005E+02
1.069000E-02	5.27266E+00	3.4278E+00	7.2464E+04	2.8802E-04	0.000E+00	1.160E+02
1.142761E-02	5.29226E+00	4.0421E+00	7.9935E+04	3.8882E-04	0.000E+00	1.085E+02
1.221612E-02	5.41943E+00	4.7143E+00	8.7210E+04	5.2227E-04	0.000E+00	1.015E+02
1.305903E-02	5.67608E+00	5.4183E+00	9.3764E+04	6.9803E-04	0.000E+00	9.494E+01
1.396010E-02	6.07660E+00	6.1198E+00	9.9067E+04	9.2833E-04	0.000E+00	8.881E+01
1.492335E-02	6.62422E+00	6.7783E+00	1.0264E+05	1.2285E-03	0.000E+00	8.308E+01
1.595306E-02	7.32014E+00	7.3518E+00	1.0414E+05	1.6179E-03	0.000E+00	7.772E+01
1.705382E-02	8.11734E+00	7.8016E+00	1.0338E+05	2.1202E-03	0.000E+00	7.270E+01
1.823053E-02	9.03318E+00	8.0975E+00	1.0038E+05	2.7651E-03	0.000E+00	6.801E+01
1.948844E-02	9.93792E+00	8.2213E+00	9.5333E+04	3.5889E-03	0.000E+00	6.362E+01
2.083314E-02	1.08250E+01	8.1690E+00	8.8613E+04	4.6357E-03	0.000E+00	5.951E+01
2.227063E-02	1.16460E+01	7.9498E+00	8.0669E+04	5.9596E-03	0.000E+00	5.567E+01
2.380730E-02	1.23560E+01	7.5848E+00	7.1997E+04	7.6253E-03	0.000E+00	5.208E+01
2.545001E-02	1.29157E+01	7.1023E+00	6.3066E+04	9.7108E-03	0.000E+00	4.872E+01
2.720606E-02	1.32835E+01	6.5331E+00	5.4267E+04	1.2309E-02	0.000E+00	4.557E+01
2.908327E-02	1.34089E+01	5.9161E+00	4.5970E+04	1.5530E-02	0.000E+00	4.263E+01
3.109002E-02	1.31912E+01	5.2858E+00	3.8422E+04	1.9504E-02	0.000E+00	3.988E+01
3.323523E-02	1.21962E+01	4.6699E+00	3.1754E+04	2.4383E-02	0.000E+00	3.731E+01
3.390800E-02	1.13408E+01	4.4909E+00	2.9930E+04	2.6050E-02	0.000E+00	3.656E+01
3.442700E-02	9.48514E+00	4.3575E+00	2.8604E+04	2.7383E-02	0.000E+00	3.601E+01
3.456540E-02	7.26152E+00	4.3227E+00	2.8261E+04	2.7745E-02	0.000E+00	3.587E+01
3.477300E-02	9.56931E+00	8.6457E+00	5.6187E+04	2.8293E-02	0.000E+00	3.566E+01
3.529200E-02	1.15804E+01	8.4385E+00	5.4035E+04	2.9692E-02	0.000E+00	3.513E+01
3.552846E-02	1.20120E+01	8.3464E+00	5.3089E+04	3.0343E-02	0.000E+00	3.490E+01
3.797993E-02	1.37977E+01	7.4692E+00	4.4443E+04	3.7590E-02	0.000E+00	3.264E+01
3.978800E-02	1.40851E+01	6.8764E+00	3.9056E+04	4.3525E-02	0.000E+00	3.116E+01
4.039700E-02	1.38521E+01	6.6792E+00	3.7365E+04	4.5638E-02	0.000E+00	3.069E+01
4.055940E-02	1.34579E+01	6.6271E+00	3.6924E+04	4.6212E-02	0.000E+00	3.057E+01
4.060054E-02	1.23158E+01	7.4507E+00	4.1471E+04	4.6358E-02	0.000E+00	3.054E+01
4.080300E-02	1.39357E+01	7.3752E+00	4.0847E+04	4.7080E-02	0.000E+00	3.039E+01
4.141200E-02	1.43817E+01	7.1514E+00	3.9026E+04	4.9289E-02	0.000E+00	2.994E+01
4.340198E-02	1.46487E+01	6.4590E+00	3.3631E+04	5.6916E-02	0.000E+00	2.857E+01
4.468800E-02	1.42887E+01	6.0458E+00	3.0574E+04	6.2176E-02	0.000E+00	2.774E+01
4.537200E-02	1.34221E+01	5.8392E+00	2.9084E+04	6.5081E-02	0.000E+00	2.733E+01
4.555440E-02	1.23252E+01	5.7861E+00	2.8704E+04	6.5868E-02	0.000E+00	2.722E+01
4.582800E-02	1.34803E+01	7.8921E+00	3.8917E+04	6.7058E-02	0.000E+00	2.705E+01
4.639671E-02	1.44092E+01	7.7273E+00	3.7638E+04	6.9570E-02	0.000E+00	2.672E+01
4.651200E-02	1.45135E+01	7.6948E+00	3.7387E+04	7.0085E-02	0.000E+00	2.666E+01
4.959809E-02	1.56927E+01	6.9252E+00	3.1553E+04	8.4662E-02	0.000E+00	2.500E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 519

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
5.302035E-02	1.61494E+01	6.2240E+00	2.6528E+04	1.0258E-01	0.000E+00	2.338E+01
5.667876E-02	1.63094E+01	5.5605E+00	2.2170E+04	1.2374E-01	0.000E+00	2.187E+01
6.058959E-02	1.62441E+01	4.9727E+00	1.8547E+04	1.4863E-01	0.000E+00	2.046E+01
6.477028E-02	1.59999E+01	4.4941E+00	1.5680E+04	1.7776E-01	0.000E+00	1.914E+01
6.923942E-02	1.56151E+01	4.1483E+00	1.3540E+04	2.1169E-01	0.000E+00	1.791E+01
7.401695E-02	1.51211E+01	3.9512E+00	1.2064E+04	2.5104E-01	0.000E+00	1.675E+01
7.912411E-02	1.45397E+01	3.9137E+00	1.1178E+04	2.9644E-01	0.000E+00	1.567E+01
8.114400E-02	1.42945E+01	3.9429E+00	1.0981E+04	3.1531E-01	0.000E+00	1.528E+01
8.238600E-02	1.41235E+01	3.9724E+00	1.0896E+04	3.2716E-01	0.000E+00	1.505E+01
8.271770E-02	1.40506E+01	3.9817E+00	1.0878E+04	3.3036E-01	0.000E+00	1.499E+01
8.321400E-02	1.40293E+01	4.0659E+00	1.1042E+04	3.3517E-01	0.000E+00	1.490E+01
8.445600E-02	1.39194E+01	4.1106E+00	1.0999E+04	3.4733E-01	0.000E+00	1.468E+01
8.458368E-02	1.39067E+01	4.1157E+00	1.0996E+04	3.4859E-01	0.000E+00	1.466E+01
9.041995E-02	1.32976E+01	4.4316E+00	1.1076E+04	4.0822E-01	0.000E+00	1.371E+01
9.665893E-02	1.26720E+01	4.9343E+00	1.1536E+04	4.7608E-01	0.000E+00	1.283E+01
1.033284E-01	1.20734E+01	5.6326E+00	1.2319E+04	5.5296E-01	0.000E+00	1.200E+01
1.104581E-01	1.15404E+01	6.5277E+00	1.3355E+04	6.3963E-01	0.000E+00	1.122E+01
1.180797E-01	1.11085E+01	7.6212E+00	1.4586E+04	7.3692E-01	0.000E+00	1.050E+01
1.262272E-01	1.07184E+01	8.9007E+00	1.5934E+04	8.4560E-01	0.000E+00	9.822E+00
1.349368E-01	1.06211E+01	1.0339E+01	1.7315E+04	9.6645E-01	0.000E+00	9.188E+00
1.442475E-01	1.07502E+01	1.1905E+01	1.8651E+04	1.1002E+00	0.000E+00	8.595E+00
1.542005E-01	1.11382E+01	1.3559E+01	1.9871E+04	1.2476E+00	0.000E+00	8.040E+00
1.648404E-01	1.18180E+01	1.5249E+01	2.0906E+04	1.4092E+00	0.000E+00	7.521E+00
1.762144E-01	1.27984E+01	1.6875E+01	2.1641E+04	1.5856E+00	0.000E+00	7.036E+00
1.883732E-01	1.40334E+01	1.8361E+01	2.2028E+04	1.7773E+00	0.000E+00	6.582E+00
2.013709E-01	1.54684E+01	1.9667E+01	2.2071E+04	1.9846E+00	0.000E+00	6.157E+00
2.152655E-01	1.70427E+01	2.0765E+01	2.1799E+04	2.2077E+00	0.000E+00	5.760E+00
2.301188E-01	1.86854E+01	2.1642E+01	2.1253E+04	2.4466E+00	0.000E+00	5.388E+00
2.459970E-01	2.02842E+01	2.2298E+01	2.0484E+04	2.7014E+00	0.000E+00	5.040E+00
2.549960E-01	2.09838E+01	2.2546E+01	1.9981E+04	2.8450E+00	0.000E+00	4.862E+00
2.588990E-01	2.10168E+01	2.2617E+01	1.9742E+04	2.9071E+00	0.000E+00	4.789E+00
2.599398E-01	2.07081E+01	2.2633E+01	1.9677E+04	2.9236E+00	0.000E+00	4.770E+00
2.615010E-01	2.12542E+01	2.3451E+01	2.0266E+04	2.9484E+00	0.000E+00	4.741E+00
2.629708E-01	2.15754E+01	2.3476E+01	2.0174E+04	2.9717E+00	0.000E+00	4.715E+00
2.654040E-01	2.19410E+01	2.3512E+01	2.0002E+04	3.0102E+00	0.000E+00	4.672E+00
2.682260E-01	2.22642E+01	2.3548E+01	1.9840E+04	3.0547E+00	0.000E+00	4.622E+00
2.723315E-01	2.25202E+01	2.3590E+01	1.9575E+04	3.1194E+00	0.000E+00	4.553E+00
2.734263E-01	2.23395E+01	2.3599E+01	1.9504E+04	3.1366E+00	0.000E+00	4.534E+00
2.750685E-01	2.28457E+01	2.4223E+01	1.9900E+04	3.1624E+00	0.000E+00	4.507E+00
2.791740E-01	2.35829E+01	2.4248E+01	1.9629E+04	3.2267E+00	0.000E+00	4.441E+00
2.811158E-01	2.38558E+01	2.4256E+01	1.9500E+04	3.2570E+00	0.000E+00	4.410E+00
3.005128E-01	2.60380E+01	2.4224E+01	1.8216E+04	3.5569E+00	0.000E+00	4.126E+00
3.212482E-01	2.78948E+01	2.4038E+01	1.6910E+04	3.8703E+00	0.000E+00	3.859E+00
3.434143E-01	2.95561E+01	2.3740E+01	1.5622E+04	4.1963E+00	0.000E+00	3.610E+00
3.671099E-01	3.10382E+01	2.3355E+01	1.4377E+04	4.5337E+00	0.000E+00	3.377E+00
3.924405E-01	3.23241E+01	2.2909E+01	1.3192E+04	4.8810E+00	0.000E+00	3.159E+00
4.195189E-01	3.33221E+01	2.2423E+01	1.2079E+04	5.2366E+00	0.000E+00	2.955E+00
4.355120E-01	3.35331E+01	2.2138E+01	1.1487E+04	5.4389E+00	0.000E+00	2.847E+00
4.421780E-01	3.31448E+01	2.2021E+01	1.1254E+04	5.5216E+00	0.000E+00	2.804E+00
4.439556E-01	3.24487E+01	2.1990E+01	1.1193E+04	5.5435E+00	0.000E+00	2.793E+00
4.466220E-01	3.33164E+01	2.3440E+01	1.1860E+04	5.5761E+00	0.000E+00	2.776E+00
4.484657E-01	3.36747E+01	2.3411E+01	1.1797E+04	5.5987E+00	0.000E+00	2.765E+00
4.532880E-01	3.42307E+01	2.3334E+01	1.1633E+04	5.6572E+00	0.000E+00	2.735E+00
4.794098E-01	3.58103E+01	2.2929E+01	1.0808E+04	5.9652E+00	0.000E+00	2.586E+00
5.075420E-01	3.68998E+01	2.2508E+01	1.0022E+04	6.2805E+00	0.000E+00	2.443E+00
5.124891E-01	3.70191E+01	2.2435E+01	9.8931E+03	6.3342E+00	0.000E+00	2.419E+00
5.153105E-01	3.70422E+01	2.2394E+01	9.8209E+03	6.3646E+00	0.000E+00	2.406E+00
5.173821E-01	3.69353E+01	2.2364E+01	9.7684E+03	6.3869E+00	0.000E+00	2.396E+00
5.204895E-01	3.72339E+01	2.2680E+01	9.8474E+03	6.4200E+00	0.000E+00	2.382E+00
5.282580E-01	3.76736E+01	2.2573E+01	9.6568E+03	6.5020E+00	0.000E+00	2.347E+00
5.478508E-01	3.84625E+01	2.2307E+01	9.2016E+03	6.7034E+00	0.000E+00	2.263E+00
5.856525E-01	3.96784E+01	2.1804E+01	8.4137E+03	7.0704E+00	0.000E+00	2.117E+00
6.125000E-01	4.03188E+01	2.1454E+01	7.9156E+03	7.3145E+00	0.000E+00	2.024E+00
6.218750E-01	4.03583E+01	2.1332E+01	7.7521E+03	7.3966E+00	0.000E+00	1.994E+00
6.243750E-01	4.01569E+01	2.1300E+01	7.7093E+03	7.4182E+00	0.000E+00	1.986E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.260625E-01	4.02949E+01	2.1811E+01	7.8731E+03	7.4327E+00	0.000E+00	1.980E+00
6.281250E-01	4.05363E+01	2.1785E+01	7.8379E+03	7.4504E+00	0.000E+00	1.974E+00
6.375000E-01	4.10343E+01	2.1667E+01	7.6808E+03	7.5300E+00	0.000E+00	1.945E+00
6.692609E-01	4.20971E+01	2.1269E+01	7.1819E+03	7.7880E+00	0.000E+00	1.853E+00
7.154399E-01	4.33490E+01	2.0696E+01	6.5373E+03	8.1338E+00	0.000E+00	1.733E+00
7.648052E-01	4.45271E+01	2.0071E+01	5.9308E+03	8.4674E+00	0.000E+00	1.621E+00
8.175768E-01	4.55966E+01	1.9120E+01	5.2850E+03	8.7866E+00	0.000E+00	1.516E+00
8.739896E-01	4.64886E+01	1.8171E+01	4.6986E+03	9.0890E+00	0.000E+00	1.419E+00
9.342948E-01	4.72513E+01	1.7232E+01	4.1680E+03	9.3722E+00	0.000E+00	1.327E+00
9.987612E-01	4.80138E+01	1.6316E+01	3.6919E+03	9.6342E+00	0.000E+00	1.241E+00
1.067676E+00	4.82750E+01	1.5112E+01	3.1986E+03	9.8731E+00	0.000E+00	1.161E+00
1.141345E+00	4.82099E+01	1.3879E+01	2.7481E+03	1.0087E+01	0.000E+00	1.086E+00
1.220098E+00	4.78114E+01	1.2748E+01	2.3613E+03	1.0274E+01	0.000E+00	1.016E+00
1.304285E+00	4.70685E+01	1.1739E+01	2.0340E+03	1.0434E+01	0.000E+00	9.506E-01
1.394281E+00	4.58964E+01	1.0836E+01	1.7563E+03	1.0564E+01	0.000E+00	8.892E-01
1.490486E+00	4.40791E+01	1.0026E+01	1.5202E+03	1.0665E+01	0.000E+00	8.318E-01
1.593329E+00	4.11061E+01	9.2981E+00	1.3188E+03	1.0736E+01	0.000E+00	7.781E-01
1.703269E+00	3.53981E+01	8.6417E+00	1.1466E+03	1.0776E+01	0.000E+00	7.279E-01
1.820795E+00	1.77060E+01	8.0397E+00	9.9784E+02	1.0785E+01	0.000E+00	6.809E-01
1.845242E+00	6.73106E+00	7.9231E+00	9.7035E+02	1.0783E+01	0.000E+00	6.719E-01
1.873485E+00	-3.26516E+01	7.7932E+00	9.4004E+02	1.0780E+01	0.000E+00	6.618E-01
1.881017E+00	-9.34676E+01	7.7593E+00	9.3221E+02	1.0778E+01	0.000E+00	6.591E-01
1.892314E+00	2.69285E+00	1.2614E+02	1.5064E+04	1.0776E+01	0.000E+00	6.552E-01
1.909922E+00	4.59077E+01	8.5168E+01	1.0077E+04	1.0773E+01	0.000E+00	6.492E-01
1.920558E+00	4.98528E+01	6.7732E+01	7.9698E+03	1.0771E+01	0.000E+00	6.456E-01
1.939155E+00	3.41083E+01	4.6216E+01	5.3859E+03	1.0766E+01	0.000E+00	6.394E-01
1.946430E+00	1.07064E+00	4.0094E+01	4.6551E+03	1.0764E+01	0.000E+00	6.370E-01
1.946951E+00	-5.32392E+00	3.9695E+01	4.6075E+03	1.0764E+01	0.000E+00	6.368E-01
1.958644E+00	5.61319E+01	1.0885E+02	1.2559E+04	1.0760E+01	0.000E+00	6.330E-01
1.987878E+00	8.50380E+01	6.1205E+01	6.9580E+03	1.0751E+01	0.000E+00	6.237E-01
2.080733E+00	6.74787E+01	2.4051E+01	2.6122E+03	1.0713E+01	0.000E+00	5.959E-01
2.224304E+00	5.61277E+01	2.1619E+01	2.1964E+03	1.0633E+01	0.000E+00	5.574E-01
2.319954E+00	5.28707E+01	2.2873E+01	2.2280E+03	1.0567E+01	0.000E+00	5.344E-01
2.355464E+00	5.07791E+01	2.3481E+01	2.2528E+03	1.0541E+01	0.000E+00	5.264E-01
2.364933E+00	4.84147E+01	2.3646E+01	2.2596E+03	1.0534E+01	0.000E+00	5.243E-01
2.377781E+00	5.06859E+01	2.8560E+01	2.7144E+03	1.0524E+01	0.000E+00	5.214E-01
2.379137E+00	5.08809E+01	2.8579E+01	2.7146E+03	1.0523E+01	0.000E+00	5.211E-01
2.414646E+00	5.33703E+01	2.9063E+01	2.7200E+03	1.0495E+01	0.000E+00	5.135E-01
2.541848E+00	5.78219E+01	2.9488E+01	2.6217E+03	1.0389E+01	0.000E+00	4.878E-01
2.627968E+00	5.97791E+01	2.8585E+01	2.4581E+03	1.0312E+01	0.000E+00	4.718E-01
2.668192E+00	5.99427E+01	2.8039E+01	2.3748E+03	1.0274E+01	0.000E+00	4.647E-01
2.678918E+00	5.92412E+01	2.7883E+01	2.3522E+03	1.0264E+01	0.000E+00	4.628E-01
2.695008E+00	6.05194E+01	2.9476E+01	2.4717E+03	1.0249E+01	0.000E+00	4.601E-01
2.717235E+00	6.15391E+01	2.9102E+01	2.4203E+03	1.0228E+01	0.000E+00	4.563E-01
2.735232E+00	6.21052E+01	2.8793E+01	2.3789E+03	1.0211E+01	0.000E+00	4.533E-01
2.873066E+00	6.44041E+01	2.6457E+01	2.0810E+03	1.0075E+01	0.000E+00	4.315E-01
2.904724E+00	6.45409E+01	2.5964E+01	2.0200E+03	1.0043E+01	0.000E+00	4.268E-01
2.917041E+00	6.44709E+01	2.5777E+01	1.9970E+03	1.0030E+01	0.000E+00	4.250E-01
2.928768E+00	6.40293E+01	2.5601E+01	1.9754E+03	1.0018E+01	0.000E+00	4.233E-01
2.946358E+00	6.47934E+01	2.6466E+01	2.0299E+03	1.0000E+01	0.000E+00	4.208E-01
2.990334E+00	6.57137E+01	2.5828E+01	1.9519E+03	9.9551E+00	0.000E+00	4.146E-01
3.105150E+00	6.70014E+01	2.4454E+01	1.7797E+03	9.8354E+00	0.000E+00	3.993E-01
3.319406E+00	6.85761E+01	2.2207E+01	1.5119E+03	9.6074E+00	0.000E+00	3.735E-01
3.548445E+00	6.96864E+01	2.0168E+01	1.2844E+03	9.3608E+00	0.000E+00	3.494E-01
3.793288E+00	7.07040E+01	1.8309E+01	1.0908E+03	9.0976E+00	0.000E+00	3.269E-01
4.053024E+00	7.14083E+01	1.6514E+01	9.2033E+02	8.8198E+00	0.000E+00	3.058E-01
4.334821E+00	7.17402E+01	1.4900E+01	7.7679E+02	8.5296E+00	0.000E+00	2.860E-01
4.633924E+00	7.19282E+01	1.3473E+01	6.5703E+02	8.2289E+00	0.000E+00	2.676E-01
4.953664E+00	7.21291E+01	1.2166E+01	5.5499E+02	7.9199E+00	0.000E+00	2.503E-01
5.295467E+00	7.21244E+01	1.0976E+01	4.6841E+02	7.6046E+00	0.000E+00	2.341E-01
5.660855E+00	7.20909E+01	9.8947E+00	3.9500E+02	7.2848E+00	0.000E+00	2.190E-01
6.051453E+00	7.19599E+01	8.9250E+00	3.3330E+02	6.9626E+00	0.000E+00	2.049E-01
6.469004E+00	7.17499E+01	8.0579E+00	2.8149E+02	6.6396E+00	0.000E+00	1.917E-01
6.915365E+00	7.14855E+01	7.2860E+00	2.3810E+02	6.3175E+00	0.000E+00	1.793E-01
7.392525E+00	7.11651E+01	6.5978E+00	2.0169E+02	5.9980E+00	0.000E+00	1.677E-01

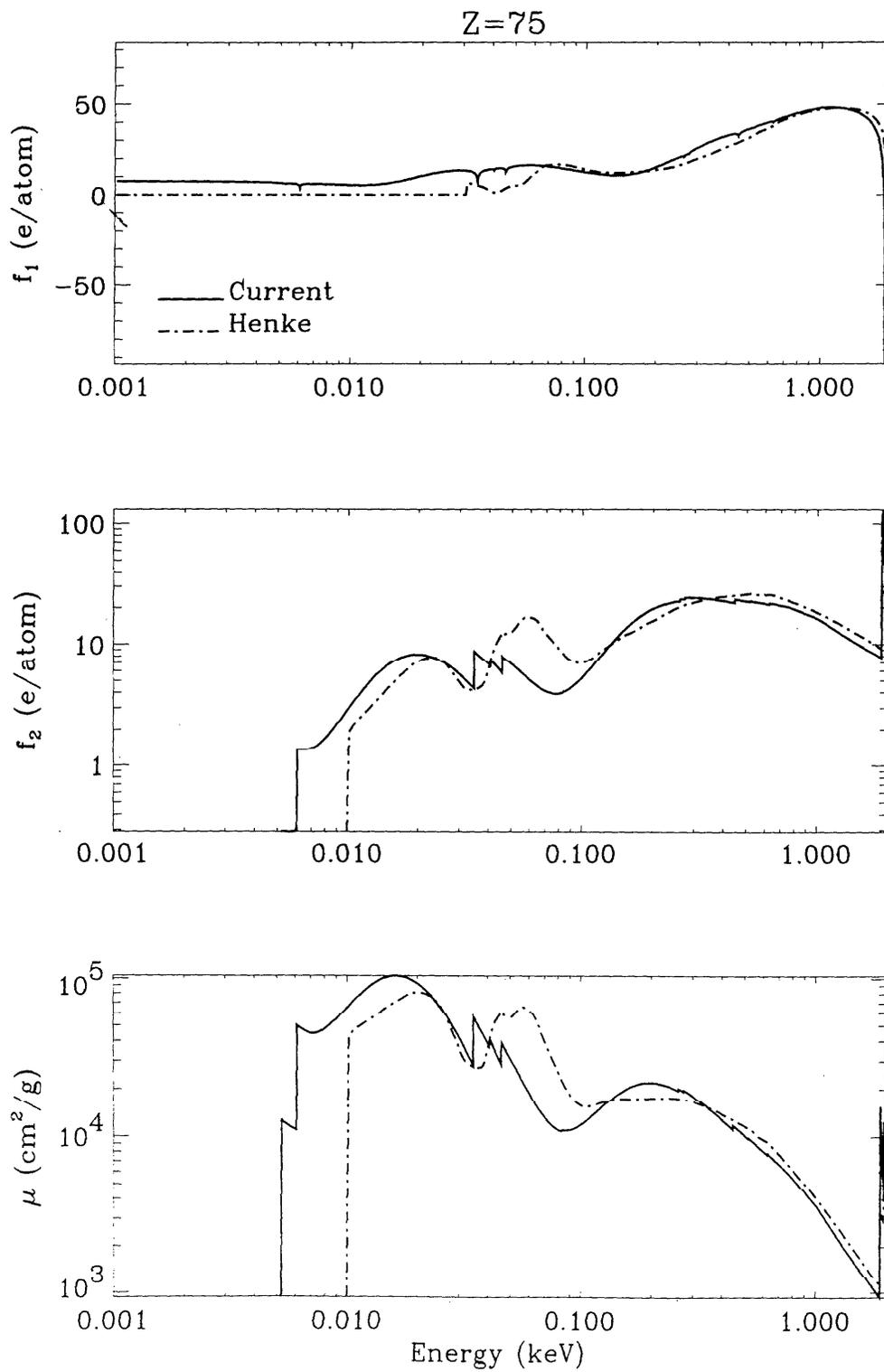
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 521

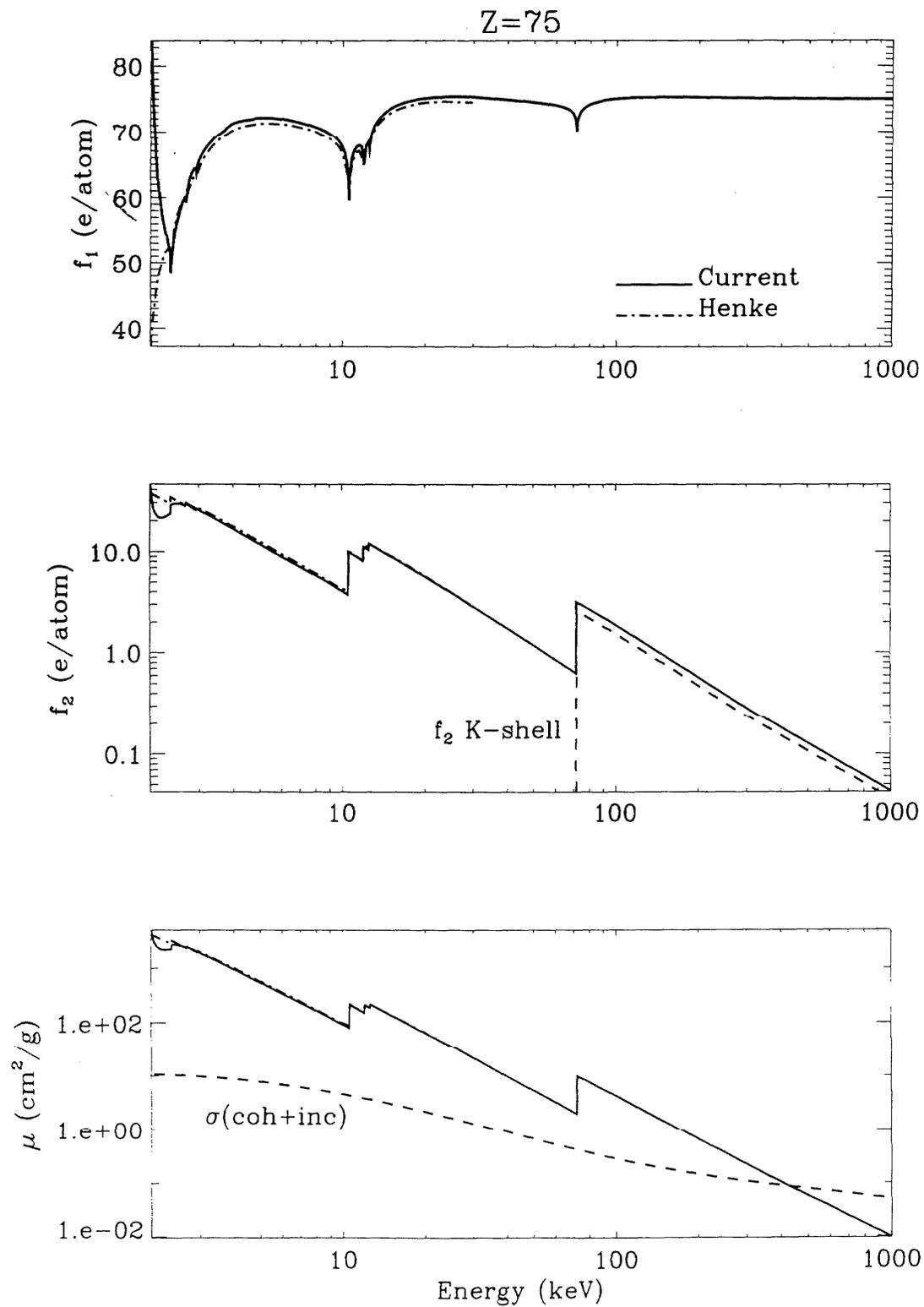
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
7.902609E+00	7.07766E+01	5.9834E+00	1.7110E+02	5.6824E+00	0.000E+00	1.569E-01
8.447890E+00	7.02902E+01	5.4254E+00	1.4513E+02	5.3721E+00	0.000E+00	1.468E-01
9.030794E+00	6.96381E+01	4.8913E+00	1.2240E+02	5.0682E+00	0.000E+00	1.373E-01
9.653919E+00	6.85353E+01	4.3617E+00	1.0210E+02	4.7719E+00	0.000E+00	1.284E-01
1.032004E+01	6.56674E+01	3.8942E+00	8.5275E+01	4.4839E+00	0.000E+00	1.201E-01
1.032459E+01	6.56244E+01	3.8912E+00	8.5171E+01	4.4821E+00	0.000E+00	1.201E-01
1.048262E+01	6.28399E+01	3.7895E+00	8.1694E+01	4.4178E+00	0.000E+00	1.183E-01
1.052476E+01	5.95870E+01	3.7631E+00	8.0801E+01	4.4009E+00	0.000E+00	1.178E-01
1.058798E+01	6.28140E+01	1.0075E+01	2.1503E+02	4.3757E+00	0.000E+00	1.171E-01
1.074601E+01	6.56471E+01	9.8178E+00	2.0647E+02	4.3138E+00	0.000E+00	1.154E-01
1.103212E+01	6.72448E+01	9.3788E+00	1.9212E+02	4.2052E+00	0.000E+00	1.124E-01
1.171953E+01	6.76542E+01	8.4363E+00	1.6268E+02	3.9612E+00	0.000E+00	1.058E-01
1.179334E+01	6.73841E+01	8.3432E+00	1.5987E+02	3.9363E+00	0.000E+00	1.051E-01
1.189891E+01	6.64793E+01	8.2128E+00	1.5598E+02	3.9012E+00	0.000E+00	1.042E-01
1.194674E+01	6.48867E+01	8.1547E+00	1.5426E+02	3.8854E+00	0.000E+00	1.038E-01
1.201849E+01	6.65730E+01	1.1272E+01	2.1196E+02	3.8620E+00	0.000E+00	1.032E-01
1.219787E+01	6.80807E+01	1.0988E+01	2.0357E+02	3.8043E+00	0.000E+00	1.016E-01
1.227617E+01	6.83474E+01	1.0867E+01	2.0005E+02	3.7796E+00	0.000E+00	1.010E-01
1.246407E+01	6.83508E+01	1.0586E+01	1.9194E+02	3.7213E+00	0.000E+00	9.947E-02
1.251417E+01	6.76623E+01	1.0513E+01	1.8986E+02	3.7060E+00	0.000E+00	9.908E-02
1.258933E+01	6.87093E+01	1.2059E+01	2.1647E+02	3.6832E+00	0.000E+00	9.848E-02
1.260708E+01	6.88899E+01	1.2033E+01	2.1570E+02	3.6779E+00	0.000E+00	9.834E-02
1.277723E+01	6.99110E+01	1.1785E+01	2.0844E+02	3.6272E+00	0.000E+00	9.704E-02
1.347697E+01	7.18024E+01	1.0844E+01	1.8184E+02	3.4302E+00	0.000E+00	9.200E-02
1.440688E+01	7.30764E+01	9.7497E+00	1.5293E+02	3.1936E+00	0.000E+00	8.606E-02
1.540095E+01	7.38716E+01	8.7608E+00	1.2855E+02	2.9683E+00	0.000E+00	8.050E-02
1.646362E+01	7.44047E+01	7.8621E+00	1.0792E+02	2.7545E+00	0.000E+00	7.531E-02
1.759961E+01	7.47592E+01	7.0514E+00	9.0543E+01	2.5520E+00	0.000E+00	7.045E-02
1.881398E+01	7.49938E+01	6.3267E+00	7.5994E+01	2.3608E+00	0.000E+00	6.590E-02
2.011215E+01	7.51456E+01	5.6795E+00	6.3816E+01	2.1809E+00	0.000E+00	6.165E-02
2.149988E+01	7.53012E+01	5.0980E+00	5.3585E+01	2.0120E+00	0.000E+00	5.767E-02
2.298338E+01	7.53469E+01	4.5723E+00	4.4958E+01	1.8537E+00	0.000E+00	5.395E-02
2.456923E+01	7.53954E+01	4.1022E+00	3.7732E+01	1.7059E+00	0.000E+00	5.046E-02
2.626450E+01	7.54193E+01	3.6772E+00	3.1639E+01	1.5681E+00	0.000E+00	4.721E-02
2.807676E+01	7.53939E+01	3.2705E+00	2.6324E+01	1.4401E+00	0.000E+00	4.416E-02
3.001405E+01	7.53316E+01	2.9034E+00	2.1860E+01	1.3213E+00	0.000E+00	4.131E-02
3.208502E+01	7.52520E+01	2.5796E+00	1.8169E+01	1.2113E+00	0.000E+00	3.864E-02
3.429889E+01	7.51615E+01	2.2939E+00	1.5114E+01	1.1098E+00	0.000E+00	3.615E-02
3.666551E+01	7.50638E+01	2.0415E+00	1.2583E+01	1.0162E+00	0.000E+00	3.381E-02
3.919543E+01	7.49608E+01	1.8183E+00	1.0484E+01	9.3016E-01	0.000E+00	3.163E-02
4.189992E+01	7.48531E+01	1.6208E+00	8.7415E+00	8.5117E-01	0.000E+00	2.959E-02
4.479101E+01	7.47403E+01	1.4457E+00	7.2943E+00	7.7881E-01	0.000E+00	2.768E-02
4.788159E+01	7.46201E+01	1.2884E+00	6.0809E+00	7.1264E-01	0.000E+00	2.589E-02
5.118542E+01	7.44871E+01	1.1483E+00	5.0699E+00	6.5223E-01	0.000E+00	2.422E-02
5.471721E+01	7.43343E+01	1.0222E+00	4.2218E+00	5.9717E-01	0.000E+00	2.266E-02
5.849270E+01	7.41439E+01	9.0681E-01	3.5035E+00	5.4707E-01	0.000E+00	2.120E-02
6.252870E+01	7.38796E+01	8.0487E-01	2.9089E+00	5.0155E-01	0.000E+00	1.983E-02
6.684318E+01	7.34235E+01	7.1433E-01	2.4151E+00	4.6025E-01	0.000E+00	1.855E-02
7.024287E+01	7.25172E+01	6.5400E-01	2.1041E+00	4.3206E-01	0.000E+00	1.765E-02
7.131802E+01	7.14235E+01	6.3662E-01	2.0173E+00	4.2384E-01	0.000E+00	1.738E-02
7.145536E+01	7.10332E+01	6.3445E-01	2.0065E+00	4.2281E-01	0.000E+00	1.735E-02
7.160472E+01	7.01142E+01	6.3211E-01	1.9949E+00	4.2170E-01	0.000E+00	1.732E-02
7.203478E+01	7.14371E+01	3.2029E+00	1.0048E+01	4.1853E-01	8.086E+00	1.721E-02
7.310993E+01	7.26320E+01	3.1325E+00	9.6829E+00	4.1080E-01	7.800E+00	1.696E-02
7.638578E+01	7.36992E+01	2.9282E+00	8.6629E+00	3.8892E-01	6.995E+00	1.623E-02
8.165640E+01	7.43552E+01	2.6232E+00	7.2598E+00	3.5827E-01	5.875E+00	1.518E-02
8.729069E+01	7.47028E+01	2.3520E+00	6.0890E+00	3.3057E-01	4.946E+00	1.420E-02
9.331374E+01	7.49250E+01	2.1121E+00	5.1151E+00	3.0556E-01	4.171E+00	1.329E-02
9.975239E+01	7.50733E+01	1.8873E+00	4.2756E+00	2.8298E-01	3.495E+00	1.243E-02
1.066353E+02	7.51704E+01	1.6866E+00	3.5744E+00	2.6260E-01	2.928E+00	1.163E-02
1.139931E+02	7.52342E+01	1.5075E+00	2.9885E+00	2.4421E-01	2.454E+00	1.088E-02
1.218587E+02	7.52751E+01	1.3476E+00	2.4991E+00	2.2761E-01	2.056E+00	1.017E-02
1.302669E+02	7.52997E+01	1.2048E+00	2.0901E+00	2.1262E-01	1.723E+00	9.518E-03
1.392553E+02	7.53128E+01	1.0772E+00	1.7482E+00	1.9907E-01	1.444E+00	8.903E-03
1.488640E+02	7.53443E+01	9.6158E-01	1.4597E+00	1.8681E-01	1.207E+00	8.329E-03

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.591356E+02	7.53404E+01	8.5722E-01	1.2173E+00	1.7571E-01	1.008E+00	7.791E-03
1.701159E+02	7.53313E+01	7.6426E-01	1.0153E+00	1.6563E-01	8.410E-01	7.288E-03
1.818539E+02	7.53187E+01	6.8146E-01	8.4684E-01	1.5647E-01	7.020E-01	6.818E-03
1.944018E+02	7.53038E+01	6.0768E-01	7.0641E-01	1.4812E-01	5.859E-01	6.378E-03
2.078156E+02	7.52875E+01	5.4194E-01	5.8933E-01	1.4049E-01	4.891E-01	5.966E-03
2.221348E+02	7.52704E+01	4.8335E-01	4.9169E-01	1.3350E-01	4.082E-01	5.581E-03
2.374835E+02	7.52530E+01	4.3114E-01	4.1027E-01	1.2706E-01	3.407E-01	5.221E-03
2.538699E+02	7.52356E+01	3.8460E-01	3.4236E-01	1.2113E-01	2.844E-01	4.884E-03
2.713869E+02	7.52184E+01	3.4311E-01	2.8571E-01	1.1564E-01	2.374E-01	4.569E-03
2.901126E+02	7.52015E+01	3.0612E-01	2.3846E-01	1.1053E-01	1.981E-01	4.274E-03
3.101304E+02	7.51849E+01	2.7314E-01	1.9903E-01	1.0576E-01	1.654E-01	3.998E-03
3.315294E+02	7.51693E+01	2.4564E-01	1.6744E-01	1.0129E-01	1.393E-01	3.740E-03
3.544049E+02	7.51553E+01	2.2097E-01	1.4090E-01	9.7090E-02	1.174E-01	3.498E-03
3.788588E+02	7.51425E+01	1.9879E-01	1.1858E-01	9.3122E-02	9.897E-02	3.273E-03
4.050001E+02	7.51308E+01	1.7886E-01	9.9800E-02	8.9361E-02	8.341E-02	3.061E-03
4.329451E+02	7.51199E+01	1.6093E-01	8.4002E-02	8.5784E-02	7.029E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 525

Os Z = 76

Atomic weight = 1.902000E+02 g/mol, nominal density ρ (g/cm³) = 2.2530E+01

μ_0 (barns/atom) = μ (cm²/g) \times 3.15835E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.21242E+05

1) edges. Edge energies (keV):

K		7.38708E+00	L	I	1.29680E+00	L	II	1.23850E+00	L	III	1.08709E+01
M	J	3.04850E+00	M	II	2.79220E+00	M	III	2.45720E+00	M	IV	2.03080E+00
M	V ^λ	1.96010E+00	N	I	6.54300E-00	N	II	5.46500E-00	N	III	4.68200E-01
N	IV	2.89400E-00	N	V	2.72800E-00	O	I	4.63000E-02	O	II	4.63000E-02
N	VI	8.37000E-02	N	VII	5.80000E-02	O	III	4.54000E-02	O	IV	7.05265E-03
O	V	6.02794E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.5563E+00, -9.1920E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.6659E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
5.907383E-03	5.43687E+00	0.0000E+00	0.0000E+00	1.5995E-05	0.000E+00	2.099E+02
5.997802E-03	5.15071E+00	0.0000E+00	0.0000E+00	1.7314E-05	0.000E+00	2.067E+02
6.021914E-03	4.85715E+00	0.0000E+00	0.0000E+00	1.7679E-05	0.000E+00	2.059E+02
6.058082E-03	5.12209E+00	5.4897E-01	2.0049E+04	1.8238E-05	0.000E+00	2.047E+02
6.148501E-03	5.31598E+00	5.4399E-01	1.9575E+04	1.9694E-05	0.000E+00	2.016E+02
6.911593E-03	4.82996E+00	5.1397E-01	1.6452E+04	3.5794E-05	0.000E+00	1.794E+02
7.017383E-03	4.35271E+00	5.1580E-01	1.6262E+04	3.8635E-05	0.000E+00	1.767E+02
7.045593E-03	3.81101E+00	5.1659E-01	1.6222E+04	3.9421E-05	0.000E+00	1.760E+02
7.087909E-03	4.34862E+00	1.5660E+00	4.8882E+04	4.0622E-05	0.000E+00	1.749E+02
7.193699E-03	4.79431E+00	1.5545E+00	4.7807E+04	4.3745E-05	0.000E+00	1.724E+02
1.069000E-02	4.06001E+00	2.8563E+00	5.9114E+04	2.8842E-04	0.000E+00	1.160E+02
1.142761E-02	3.83030E+00	3.4898E+00	6.7564E+04	3.8935E-04	0.000E+00	1.085E+02
1.221612E-02	3.67817E+00	4.2589E+00	7.7132E+04	5.2296E-04	0.000E+00	1.015E+02
1.305903E-02	3.64823E+00	5.1556E+00	8.7344E+04	6.9894E-04	0.000E+00	9.494E+01
1.396010E-02	3.78702E+00	6.1562E+00	9.7565E+04	9.2950E-04	0.000E+00	8.881E+01
1.492333E-02	4.13658E+00	7.2192E+00	1.0703E+05	1.2301E-03	0.000E+00	8.308E+01
1.595306E-02	4.72647E+00	8.2856E+00	1.1491E+05	1.6198E-03	0.000E+00	7.772E+01
1.705382E-02	5.56591E+00	9.2837E+00	1.2044E+05	2.1228E-03	0.000E+00	7.270E+01
1.823053E-02	6.66196E+00	1.0137E+01	1.2303E+05	2.7684E-03	0.000E+00	6.801E+01
1.948844E-02	7.92370E+00	1.0778E+01	1.2235E+05	3.5930E-03	0.000E+00	6.362E+01
2.083314E-02	9.30795E+00	1.1152E+01	1.1843E+05	4.6411E-03	0.000E+00	5.951E+01
2.227063E-02	1.07730E+01	1.1234E+01	1.1160E+05	5.9664E-03	0.000E+00	5.567E+01
2.380730E-02	1.21547E+01	1.1025E+01	1.0246E+05	7.6340E-03	0.000E+00	5.208E+01
2.545001E-02	1.34151E+01	1.0553E+01	9.1742E+04	9.7219E-03	0.000E+00	4.872E+01
2.720606E-02	1.44901E+01	9.8659E+00	8.0230E+04	1.2323E-02	0.000E+00	4.557E+01
2.908327E-02	1.53372E+01	9.0253E+00	6.8657E+04	1.5548E-02	0.000E+00	4.263E+01
3.109002E-02	1.59315E+01	8.0922E+00	5.7586E+04	1.9527E-02	0.000E+00	3.988E+01
3.323523E-02	1.62636E+01	7.1306E+00	4.7467E+04	2.4411E-02	0.000E+00	3.731E+01
3.552846E-02	1.63346E+01	6.1929E+00	3.8564E+04	3.0379E-02	0.000E+00	3.490E+01
3.797993E-02	1.61358E+01	5.3160E+00	3.0967E+04	3.7635E-02	0.000E+00	3.264E+01
4.060054E-02	1.56027E+01	4.5225E+00	2.4644E+04	4.6415E-02	0.000E+00	3.054E+01
4.340198E-02	1.43750E+01	3.8227E+00	1.9486E+04	5.6988E-02	0.000E+00	2.857E+01
4.449200E-02	1.32731E+01	3.5870E+00	1.7837E+04	6.1436E-02	0.000E+00	2.787E+01
4.517300E-02	1.13899E+01	3.4490E+00	1.6892E+04	6.4311E-02	0.000E+00	2.745E+01
4.537400E-02	8.51787E+00	3.4096E+00	1.6625E+04	6.5173E-02	0.000E+00	2.732E+01
4.562700E-02	1.13463E+01	7.4612E+00	3.6179E+04	6.6268E-02	0.000E+00	2.717E+01
4.606850E-02	1.25223E+01	7.2925E+00	3.5022E+04	6.8202E-02	0.000E+00	2.691E+01
4.625370E-02	1.24059E+01	7.2233E+00	3.4551E+04	6.9023E-02	0.000E+00	2.681E+01
4.630800E-02	1.19946E+01	8.0959E+00	3.8679E+04	6.9264E-02	0.000E+00	2.677E+01
4.639671E-02	1.28348E+01	8.0585E+00	3.8427E+04	6.9660E-02	0.000E+00	2.672E+01
4.653150E-02	1.32592E+01	8.0023E+00	3.8048E+04	7.0264E-02	0.000E+00	2.665E+01
4.722600E-02	1.42971E+01	7.7210E+00	3.6171E+04	7.3420E-02	0.000E+00	2.625E+01
4.959809E-02	1.55895E+01	6.8584E+00	3.0593E+04	8.4774E-02	0.000E+00	2.500E+01
5.302033E-02	1.59956E+01	5.8009E+00	2.4331E+04	1.0272E-01	0.000E+00	2.338E+01
5.667876E-02	1.53856E+01	4.9842E+00	1.9455E+04	1.2392E-01	0.000E+00	2.187E+01
5.684000E-02	1.53069E+01	4.9520E+00	1.9275E+04	1.2490E-01	0.000E+00	2.181E+01
5.771000E-02	1.44436E+01	4.7851E+00	1.8345E+04	1.3026E-01	0.000E+00	2.148E+01
5.794200E-02	1.34254E+01	4.7425E+00	1.8109E+04	1.3172E-01	0.000E+00	2.140E+01
5.829000E-02	1.44565E+01	6.6712E+00	2.5321E+04	1.3391E-01	0.000E+00	2.127E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
5.916000E-02	1.53382E+01	6.5044E+00	2.4325E+04	1.3946E-01	0.000E+00	2.096E+01
6.058959E-02	1.58224E+01	6.2525E+00	2.2831E+04	1.4885E-01	0.000E+00	2.046E+01
6.477028E-02	1.62596E+01	5.6534E+00	1.9311E+04	1.7803E-01	0.000E+00	1.914E+01
6.923942E-02	1.63067E+01	5.1344E+00	1.6406E+04	2.1202E-01	0.000E+00	1.791E+01
7.401695E-02	1.61153E+01	4.6965E+00	1.4038E+04	2.5143E-01	0.000E+00	1.675E+01
7.912411E-02	1.57335E+01	4.3797E+00	1.2246E+04	2.9692E-01	0.000E+00	1.567E+01
8.202600E-02	1.54516E+01	4.2706E+00	1.1519E+04	3.2425E-01	0.000E+00	1.512E+01
8.328150E-02	1.52980E+01	4.2389E+00	1.1261E+04	3.3639E-01	0.000E+00	1.489E+01
8.361630E-02	1.52257E+01	4.2320E+00	1.1197E+04	3.3966E-01	0.000E+00	1.483E+01
8.411850E-02	1.52156E+01	4.3005E+00	1.1311E+04	3.4459E-01	0.000E+00	1.474E+01
8.458368E-02	1.51878E+01	4.2938E+00	1.1231E+04	3.4918E-01	0.000E+00	1.466E+01
8.537400E-02	1.51242E+01	4.2852E+00	1.1105E+04	3.5704E-01	0.000E+00	1.452E+01
9.041995E-02	1.46327E+01	4.3116E+00	1.0550E+04	4.0893E-01	0.000E+00	1.371E+01
9.665893E-02	1.39803E+01	4.5235E+00	1.0354E+04	4.7694E-01	0.000E+00	1.283E+01
1.033284E-01	1.32929E+01	4.9436E+00	1.0585E+04	5.5399E-01	0.000E+00	1.200E+01
1.104581E-01	1.26108E+01	5.5827E+00	1.1182E+04	6.4087E-01	0.000E+00	1.122E+01
1.180797E-01	1.19764E+01	6.4502E+00	1.2085E+04	7.3839E-01	0.000E+00	1.050E+01
1.262272E-01	1.14366E+01	7.5436E+00	1.3222E+04	8.4735E-01	0.000E+00	9.822E+00
1.349368E-01	1.10393E+01	8.8536E+00	1.4516E+04	9.6852E-01	0.000E+00	9.188E+00
1.442475E-01	1.08266E+01	1.0362E+01	1.5893E+04	1.1027E+00	0.000E+00	8.595E+00
1.542005E-01	1.08645E+01	1.2028E+01	1.7257E+04	1.2505E+00	0.000E+00	8.040E+00
1.648404E-01	1.11817E+01	1.3805E+01	1.8528E+04	1.4126E+00	0.000E+00	7.521E+00
1.762144E-01	1.18116E+01	1.5635E+01	1.9631E+04	1.5895E+00	0.000E+00	7.036E+00
1.883732E-01	1.27716E+01	1.7455E+01	2.0500E+04	1.7818E+00	0.000E+00	6.582E+00
2.013709E-01	1.40558E+01	1.9145E+01	2.1034E+04	1.9898E+00	0.000E+00	6.157E+00
2.152655E-01	1.55949E+01	2.0628E+01	2.1201E+04	2.2136E+00	0.000E+00	5.760E+00
2.301188E-01	1.73100E+01	2.1867E+01	2.1023E+04	2.4534E+00	0.000E+00	5.388E+00
2.459970E-01	1.91095E+01	2.2842E+01	2.0543E+04	2.7091E+00	0.000E+00	5.040E+00
2.629708E-01	2.08401E+01	2.3542E+01	1.9806E+04	2.9805E+00	0.000E+00	4.715E+00
2.673440E-01	2.11921E+01	2.3659E+01	1.9580E+04	3.0499E+00	0.000E+00	4.638E+00
2.714360E-01	2.13260E+01	2.3751E+01	1.9359E+04	3.1147E+00	0.000E+00	4.568E+00
2.725272E-01	2.10971E+01	2.3772E+01	1.9299E+04	3.1319E+00	0.000E+00	4.549E+00
2.741640E-01	2.15895E+01	2.4465E+01	1.9743E+04	3.1577E+00	0.000E+00	4.522E+00
2.782560E-01	2.22684E+01	2.4553E+01	1.9522E+04	3.2221E+00	0.000E+00	4.456E+00
2.811158E-01	2.26139E+01	2.4606E+01	1.9365E+04	3.2670E+00	0.000E+00	4.410E+00
2.836120E-01	2.28744E+01	2.4646E+01	1.9226E+04	3.3061E+00	0.000E+00	4.372E+00
2.879530E-01	2.31714E+01	2.4704E+01	1.8981E+04	3.3738E+00	0.000E+00	4.306E+00
2.891106E-01	2.30454E+01	2.4717E+01	1.8915E+04	3.3918E+00	0.000E+00	4.288E+00
2.908470E-01	2.34970E+01	2.5243E+01	1.9202E+04	3.4188E+00	0.000E+00	4.263E+00
2.951880E-01	2.41977E+01	2.5291E+01	1.8956E+04	3.4860E+00	0.000E+00	4.200E+00
3.005128E-01	2.48701E+01	2.5334E+01	1.8651E+04	3.5681E+00	0.000E+00	4.126E+00
3.212482E-01	2.70645E+01	2.5351E+01	1.7459E+04	3.8829E+00	0.000E+00	3.859E+00
3.434143E-01	2.90260E+01	2.5183E+01	1.6224E+04	4.2104E+00	0.000E+00	3.610E+00
3.671099E-01	3.08046E+01	2.4870E+01	1.4988E+04	4.5493E+00	0.000E+00	3.377E+00
3.924405E-01	3.23961E+01	2.4446E+01	1.3782E+04	4.8983E+00	0.000E+00	3.159E+00
4.195189E-01	3.37687E+01	2.3940E+01	1.2625E+04	5.2556E+00	0.000E+00	2.955E+00
4.484657E-01	3.47750E+01	2.3377E+01	1.1532E+04	5.6196E+00	0.000E+00	2.765E+00
4.588360E-01	3.48718E+01	2.3174E+01	1.1174E+04	5.7455E+00	0.000E+00	2.702E+00
4.658590E-01	3.44856E+01	2.3037E+01	1.0941E+04	5.8294E+00	0.000E+00	2.661E+00
4.677318E-01	3.37681E+01	2.3000E+01	1.0879E+04	5.8516E+00	0.000E+00	2.651E+00
4.705410E-01	3.46743E+01	2.4498E+01	1.1519E+04	5.8847E+00	0.000E+00	2.635E+00
4.775640E-01	3.56373E+01	2.4371E+01	1.1290E+04	5.9668E+00	0.000E+00	2.596E+00
4.794098E-01	3.57982E+01	2.4338E+01	1.1232E+04	5.9882E+00	0.000E+00	2.586E+00
5.124891E-01	3.76595E+01	2.3750E+01	1.0253E+04	6.3593E+00	0.000E+00	2.419E+00
5.355700E-01	3.85214E+01	2.3349E+01	9.6454E+03	6.6045E+00	0.000E+00	2.315E+00
5.437675E-01	3.86776E+01	2.3208E+01	9.4428E+03	6.6890E+00	0.000E+00	2.280E+00
5.459535E-01	3.85717E+01	2.3171E+01	9.3898E+03	6.7113E+00	0.000E+00	2.271E+00
5.478508E-01	3.87467E+01	2.3505E+01	9.4923E+03	6.7306E+00	0.000E+00	2.263E+00
5.492325E-01	3.88793E+01	2.3483E+01	9.4593E+03	6.7446E+00	0.000E+00	2.257E+00
5.574300E-01	3.93353E+01	2.3349E+01	9.2671E+03	6.8268E+00	0.000E+00	2.224E+00
5.856525E-01	4.04160E+01	2.2895E+01	8.6491E+03	7.0998E+00	0.000E+00	2.117E+00
6.260625E-01	4.16025E+01	2.2262E+01	7.8672E+03	7.4645E+00	0.000E+00	1.980E+00
6.412140E-01	4.19207E+01	2.2029E+01	7.6009E+03	7.5936E+00	0.000E+00	1.934E+00
6.510285E-01	4.19624E+01	2.1880E+01	7.4355E+03	7.6751E+00	0.000E+00	1.904E+00
6.536457E-01	4.17605E+01	2.1840E+01	7.3923E+03	7.6966E+00	0.000E+00	1.897E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 527

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
6.575715E-01	4.21419E+01	2.2317E+01	7.5085E+03	7.7285E+00	0.000E+00	1.885E+00
6.673860E-01	4.26417E+01	2.2171E+01	7.3500E+03	7.8073E+00	0.000E+00	1.858E+00
6.692609E-01	4.27140E+01	2.2144E+01	7.3203E+03	7.8222E+00	0.000E+00	1.853E+00
7.154399E-01	4.40947E+01	2.1474E+01	6.6407E+03	8.1703E+00	0.000E+00	1.733E+00
7.648052E-01	4.52692E+01	2.0781E+01	6.0115E+03	8.5064E+00	0.000E+00	1.621E+00
8.175768E-01	4.63490E+01	2.0058E+01	5.4278E+03	8.8280E+00	0.000E+00	1.516E+00
8.739896E-01	4.73783E+01	1.9287E+01	4.8822E+03	9.1328E+00	0.000E+00	1.419E+00
9.342948E-01	4.82616E+01	1.8280E+01	4.3288E+03	9.4185E+00	0.000E+00	1.327E+00
9.987612E-01	4.90131E+01	1.7296E+01	3.8313E+03	9.6829E+00	0.000E+00	1.241E+00
1.067676E+00	4.94166E+01	1.6068E+01	3.3297E+03	9.9241E+00	0.000E+00	1.161E+00
1.141345E+00	4.95677E+01	1.4853E+01	2.8791E+03	1.0140E+01	0.000E+00	1.086E+00
1.220098E+00	4.94127E+01	1.3651E+01	2.4753E+03	1.0330E+01	0.000E+00	1.016E+00
1.304285E+00	4.89244E+01	1.2560E+01	2.1305E+03	1.0491E+01	0.000E+00	9.506E-01
1.394281E+00	4.80708E+01	1.1583E+01	1.8380E+03	1.0624E+01	0.000E+00	8.892E-01
1.490486E+00	4.67351E+01	1.0707E+01	1.5894E+03	1.0727E+01	0.000E+00	8.318E-01
1.593329E+00	4.46256E+01	9.9199E+00	1.3774E+03	1.0799E+01	0.000E+00	7.781E-01
1.703269E+00	4.10103E+01	9.2099E+00	1.1963E+03	1.0840E+01	0.000E+00	7.279E-01
1.820795E+00	3.32132E+01	8.5690E+00	1.0412E+03	1.0851E+01	0.000E+00	6.809E-01
1.920898E+00	9.96160E+00	8.0896E+00	9.3173E+02	1.0837E+01	0.000E+00	6.454E-01
1.946430E+00	-1.70569E+01	7.9744E+00	9.0642E+02	1.0831E+01	0.000E+00	6.370E-01
1.950300E+00	-2.69887E+01	7.9572E+00	9.0267E+02	1.0830E+01	0.000E+00	6.357E-01
1.958140E+00	-8.36092E+01	7.9228E+00	8.9516E+02	1.0827E+01	0.000E+00	6.332E-01
1.969901E+00	5.07214E+00	1.1826E+02	1.3282E+04	1.0824E+01	0.000E+00	6.294E-01
1.990184E+00	4.69482E+01	7.7856E+01	8.6550E+03	1.0817E+01	0.000E+00	6.230E-01
1.999302E+00	4.96339E+01	6.4956E+01	7.1880E+03	1.0814E+01	0.000E+00	6.201E-01
2.020646E+00	3.33941E+01	4.3374E+01	4.7491E+03	1.0806E+01	0.000E+00	6.136E-01
2.028769E+00	-5.46232E+00	3.7518E+01	4.0914E+03	1.0803E+01	0.000E+00	6.111E-01
2.040954E+00	5.51647E+01	1.0631E+02	1.1524E+04	1.0798E+01	0.000E+00	6.075E-01
2.071416E+00	8.42516E+01	6.0510E+01	6.4629E+03	1.0785E+01	0.000E+00	5.985E-01
2.080733E+00	8.45636E+01	5.2293E+01	5.5602E+03	1.0781E+01	0.000E+00	5.959E-01
2.224304E+00	6.20409E+01	2.2038E+01	2.1920E+03	1.0701E+01	0.000E+00	5.574E-01
2.377781E+00	5.51948E+01	2.2551E+01	2.0982E+03	1.0593E+01	0.000E+00	5.214E-01
2.408056E+00	5.42626E+01	2.2973E+01	2.1107E+03	1.0570E+01	0.000E+00	5.149E-01
2.444914E+00	5.21987E+01	2.3526E+01	2.1289E+03	1.0540E+01	0.000E+00	5.071E-01
2.454743E+00	4.98496E+01	2.3676E+01	2.1338E+03	1.0532E+01	0.000E+00	5.051E-01
2.469486E+00	5.23047E+01	2.8561E+01	2.5588E+03	1.0520E+01	0.000E+00	5.021E-01
2.506344E+00	5.47811E+01	2.8992E+01	2.5592E+03	1.0489E+01	0.000E+00	4.947E-01
2.541848E+00	5.61773E+01	2.9372E+01	2.5565E+03	1.0458E+01	0.000E+00	4.878E-01
2.717235E+00	6.10422E+01	2.8460E+01	2.3173E+03	1.0297E+01	0.000E+00	4.563E-01
2.736356E+00	6.13328E+01	2.8204E+01	2.2803E+03	1.0279E+01	0.000E+00	4.531E-01
2.778239E+00	6.14461E+01	2.7602E+01	2.1980E+03	1.0238E+01	0.000E+00	4.463E-01
2.789408E+00	6.07365E+01	2.7434E+01	2.1759E+03	1.0227E+01	0.000E+00	4.445E-01
2.806161E+00	6.19796E+01	2.8994E+01	2.2859E+03	1.0211E+01	0.000E+00	4.418E-01
2.848044E+00	6.34899E+01	2.8284E+01	2.1972E+03	1.0169E+01	0.000E+00	4.353E-01
2.904724E+00	6.46214E+01	2.7321E+01	2.0810E+03	1.0112E+01	0.000E+00	4.268E-01
2.987530E+00	6.55345E+01	2.6035E+01	1.9280E+03	1.0027E+01	0.000E+00	4.150E-01
3.033258E+00	6.55049E+01	2.5435E+01	1.8552E+03	9.9799E+00	0.000E+00	4.087E-01
3.045452E+00	6.50538E+01	2.5284E+01	1.8368E+03	9.9671E+00	0.000E+00	4.071E-01
3.063743E+00	6.57966E+01	2.6176E+01	1.8902E+03	9.9480E+00	0.000E+00	4.047E-01
3.105150E+00	6.66460E+01	2.5677E+01	1.8295E+03	9.9045E+00	0.000E+00	3.993E-01
3.109470E+00	6.67104E+01	2.5626E+01	1.8233E+03	9.8999E+00	0.000E+00	3.987E-01
3.319406E+00	6.87798E+01	2.3322E+01	1.5544E+03	9.6760E+00	0.000E+00	3.735E-01
3.548445E+00	7.01185E+01	2.1171E+01	1.3200E+03	9.4287E+00	0.000E+00	3.494E-01
3.793288E+00	7.10676E+01	1.9233E+01	1.1218E+03	9.1646E+00	0.000E+00	3.269E-01
4.055024E+00	7.19828E+01	1.7438E+01	9.5145E+02	8.8858E+00	0.000E+00	3.058E-01
4.334821E+00	7.25849E+01	1.5717E+01	8.0219E+02	8.5944E+00	0.000E+00	2.860E-01
4.633924E+00	7.28468E+01	1.4194E+01	6.7767E+02	8.2924E+00	0.000E+00	2.676E-01
4.953664E+00	7.30951E+01	1.2837E+01	5.7334E+02	7.9818E+00	0.000E+00	2.503E-01
5.295467E+00	7.31443E+01	1.1580E+01	4.8381E+02	7.6649E+00	0.000E+00	2.341E-01
5.660855E+00	7.31511E+01	1.0449E+01	4.0837E+02	7.3434E+00	0.000E+00	2.190E-01
6.051453E+00	7.30388E+01	9.4215E+00	3.4445E+02	7.0192E+00	0.000E+00	2.049E-01
6.469004E+00	7.28802E+01	8.5019E+00	2.9077E+02	6.6943E+00	0.000E+00	1.917E-01
6.915365E+00	7.26464E+01	7.6832E+00	2.4581E+02	6.3703E+00	0.000E+00	1.793E-01
7.392525E+00	7.23589E+01	6.9538E+00	2.0811E+02	6.0487E+00	0.000E+00	1.677E-01
7.902609E+00	7.20117E+01	6.3032E+00	1.7647E+02	5.7310E+00	0.000E+00	1.569E-01

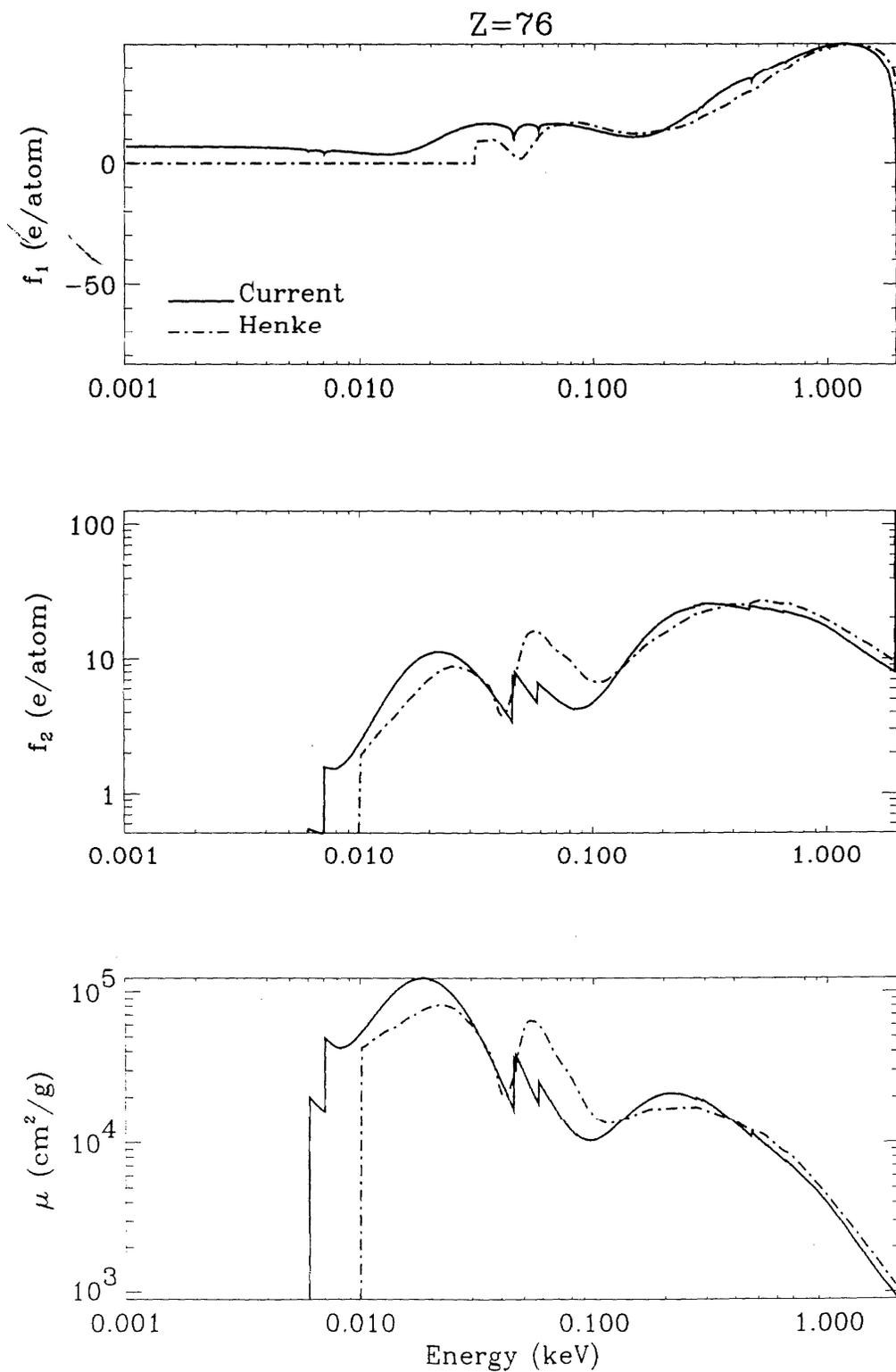
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

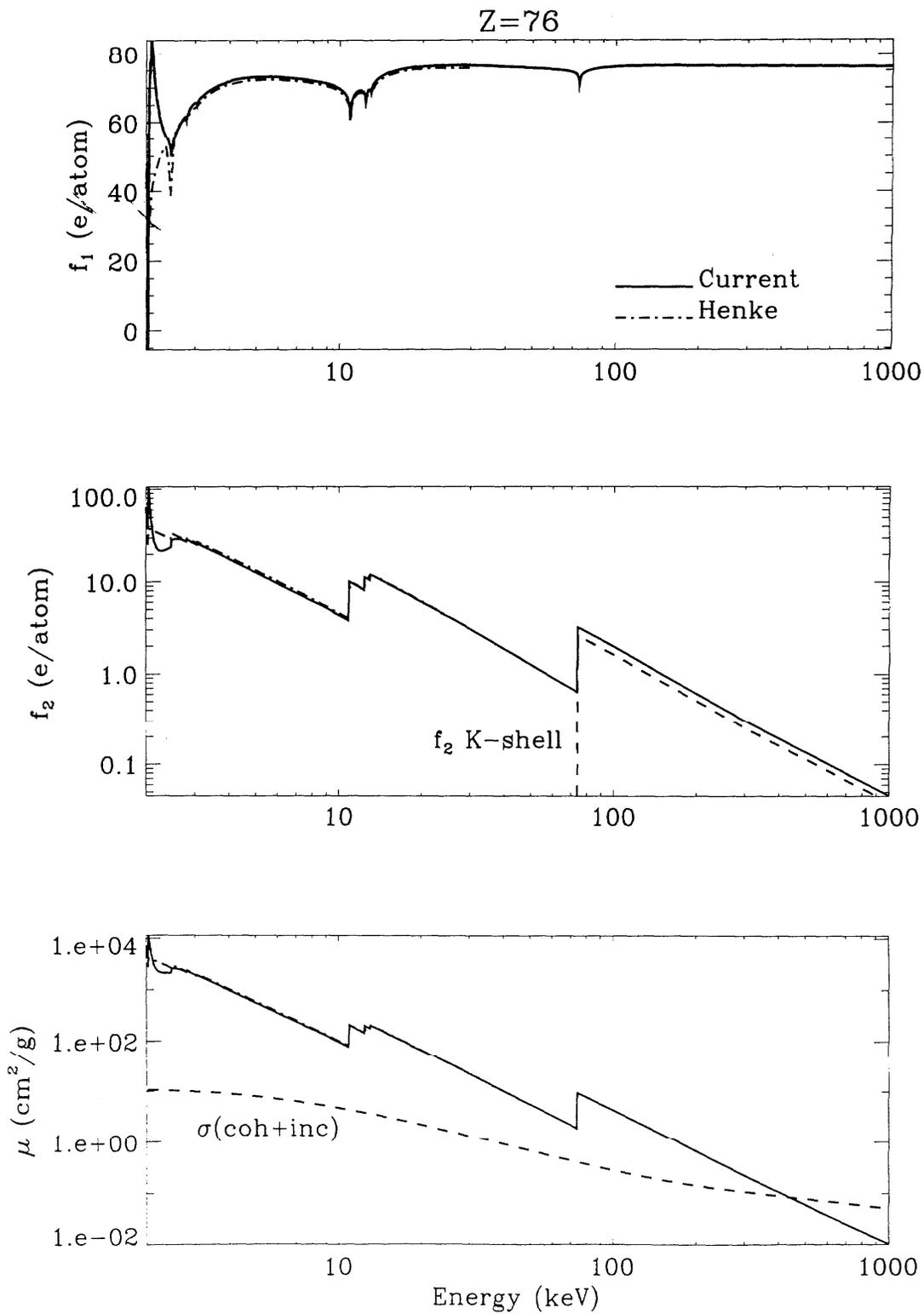
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
8.447890E+00	7.15881E+01	5.7220E+00	1.4986E+02	5.4186E+00	0.000E+00	1.468E-01
9.030794E+00	7.10612E+01	5.1662E+00	1.2656E+02	5.1126E+00	0.000E+00	1.373E-01
9.653919E+00	7.02032E+01	4.6054E+00	1.0554E+02	4.8141E+00	0.000E+00	1.284E-01
1.032004E+01	6.85702E+01	4.1140E+00	8.8196E+01	4.5240E+00	0.000E+00	1.201E-01
1.065348E+01	6.67008E+01	3.9003E+00	8.0999E+01	4.3890E+00	0.000E+00	1.164E-01
1.081655E+01	6.39315E+01	3.7989E+00	7.7703E+01	4.3252E+00	0.000E+00	1.146E-01
1.086003E+01	6.06949E+01	3.7726E+00	7.6857E+01	4.3085E+00	0.000E+00	1.142E-01
1.092525E+01	6.39065E+01	1.0054E+01	2.0360E+02	4.2835E+00	0.000E+00	1.135E-01
1.103212E+01	6.61286E+01	9.8862E+00	1.9826E+02	4.2432E+00	0.000E+00	1.124E-01
1.108832E+01	6.67292E+01	9.7998E+00	1.9553E+02	4.2222E+00	0.000E+00	1.118E-01
1.179334E+01	6.90428E+01	8.8051E+00	1.6518E+02	3.9722E+00	0.000E+00	1.051E-01
1.213730E+01	6.87669E+01	8.3732E+00	1.5263E+02	3.8586E+00	0.000E+00	1.022E-01
1.232308E+01	6.75864E+01	8.1516E+00	1.4635E+02	3.7994E+00	0.000E+00	1.006E-01
1.237262E+01	6.59983E+01	8.0940E+00	1.4473E+02	3.7839E+00	0.000E+00	1.002E-01
1.244693E+01	6.76734E+01	1.1198E+01	1.9905E+02	3.7608E+00	0.000E+00	9.961E-02
1.260708E+01	6.90535E+01	1.0954E+01	1.9223E+02	3.7117E+00	0.000E+00	9.834E-02
1.263270E+01	6.91650E+01	1.0915E+01	1.9117E+02	3.7039E+00	0.000E+00	9.815E-02
1.270864E+01	6.94128E+01	1.0803E+01	1.8807E+02	3.6811E+00	0.000E+00	9.756E-02
1.290316E+01	6.94181E+01	1.0524E+01	1.8044E+02	3.6236E+00	0.000E+00	9.609E-02
1.295503E+01	6.87330E+01	1.0451E+01	1.7848E+02	3.6085E+00	0.000E+00	9.570E-02
1.303284E+01	6.97742E+01	1.1989E+01	2.0352E+02	3.5860E+00	0.000E+00	9.513E-02
1.322736E+01	7.09684E+01	1.1716E+01	1.9596E+02	3.5308E+00	0.000E+00	9.373E-02
1.347697E+01	7.18031E+01	1.1380E+01	1.8682E+02	3.4620E+00	0.000E+00	9.200E-02
1.440688E+01	7.35317E+01	1.0243E+01	1.5730E+02	3.2235E+00	0.000E+00	8.606E-02
1.540095E+01	7.45193E+01	9.2061E+00	1.3225E+02	2.9963E+00	0.000E+00	8.050E-02
1.646362E+01	7.51662E+01	8.2709E+00	1.1115E+02	2.7806E+00	0.000E+00	7.531E-02
1.759961E+01	7.56001E+01	7.4210E+00	9.3289E+01	2.5763E+00	0.000E+00	7.045E-02
1.881398E+01	7.58884E+01	6.6588E+00	7.8304E+01	2.3835E+00	0.000E+00	6.590E-02
2.011215E+01	7.60779E+01	5.9775E+00	6.5755E+01	2.2019E+00	0.000E+00	6.165E-02
2.149988E+01	7.61991E+01	5.3686E+00	5.5245E+01	2.0314E+00	0.000E+00	5.767E-02
2.298338E+01	7.63299E+01	4.8164E+00	4.6364E+01	1.8717E+00	0.000E+00	5.395E-02
2.456923E+01	7.63600E+01	4.3229E+00	3.8927E+01	1.7225E+00	0.000E+00	5.046E-02
2.626450E+01	7.64321E+01	3.8784E+00	3.2670E+01	1.5834E+00	0.000E+00	4.721E-02
2.807676E+01	7.64168E+01	3.4496E+00	2.7183E+01	1.4541E+00	0.000E+00	4.416E-02
3.001405E+01	7.63631E+01	3.0625E+00	2.2575E+01	1.3341E+00	0.000E+00	4.131E-02
3.208502E+01	7.62893E+01	2.7212E+00	1.8764E+01	1.2230E+00	0.000E+00	3.864E-02
3.429889E+01	7.62029E+01	2.4198E+00	1.5609E+01	1.1204E+00	0.000E+00	3.615E-02
3.666551E+01	7.61083E+01	2.1537E+00	1.2995E+01	1.0259E+00	0.000E+00	3.381E-02
3.919543E+01	7.60079E+01	1.9184E+00	1.0828E+01	9.3893E-01	0.000E+00	3.163E-02
4.189992E+01	7.59027E+01	1.7101E+00	9.0297E+00	8.5910E-01	0.000E+00	2.959E-02
4.479101E+01	7.57929E+01	1.5255E+00	7.5352E+00	7.8594E-01	0.000E+00	2.768E-02
4.788159E+01	7.56773E+01	1.3611E+00	6.2892E+00	7.1904E-01	0.000E+00	2.589E-02
5.118542E+01	7.55514E+01	1.2132E+00	5.2441E+00	6.5795E-01	0.000E+00	2.422E-02
5.471721E+01	7.54097E+01	1.0816E+00	4.3734E+00	6.0226E-01	0.000E+00	2.266E-02
5.849270E+01	7.52406E+01	9.6140E-01	3.6364E+00	5.5158E-01	0.000E+00	2.120E-02
6.252870E+01	7.50181E+01	8.5345E-01	3.0197E+00	5.0552E-01	0.000E+00	1.983E-02
6.684318E+01	7.46783E+01	7.5785E-01	2.5084E+00	4.6372E-01	0.000E+00	1.855E-02
7.145536E+01	7.39039E+01	6.7312E-01	2.0841E+00	4.2583E-01	0.000E+00	1.735E-02
7.239338E+01	7.35326E+01	6.5775E-01	2.0102E+00	4.1886E-01	0.000E+00	1.713E-02
7.350144E+01	7.24458E+01	6.4032E-01	1.9274E+00	4.1090E-01	0.000E+00	1.687E-02
7.379693E+01	7.11446E+01	6.3580E-01	1.9061E+00	4.0883E-01	0.000E+00	1.680E-02
7.424015E+01	7.24596E+01	3.1906E+00	9.5082E+00	4.0576E-01	7.633E+00	1.670E-02
7.534821E+01	7.36472E+01	3.1202E+00	9.1617E+00	3.9828E-01	7.362E+00	1.645E-02
7.638578E+01	7.41160E+01	3.0566E+00	8.8532E+00	3.9153E-01	7.120E+00	1.623E-02
8.165640E+01	7.51235E+01	2.7456E+00	7.4390E+00	3.6050E-01	6.001E+00	1.518E-02
8.729069E+01	7.55687E+01	2.4600E+00	6.2350E+00	3.3245E-01	5.047E+00	1.420E-02
9.331374E+01	7.58340E+01	2.2080E+00	5.2351E+00	3.0712E-01	4.254E+00	1.329E-02
9.975239E+01	7.60122E+01	1.9780E+00	4.3871E+00	2.8425E-01	3.576E+00	1.243E-02
1.066353E+02	7.61284E+01	1.7681E+00	3.6684E+00	2.6360E-01	2.997E+00	1.163E-02
1.139931E+02	7.62052E+01	1.5807E+00	3.0679E+00	2.4497E-01	2.512E+00	1.088E-02
1.218587E+02	7.62552E+01	1.4134E+00	2.5661E+00	2.2816E-01	2.106E+00	1.017E-02
1.302669E+02	7.62863E+01	1.2639E+00	2.1466E+00	2.1297E-01	1.765E+00	9.518E-03
1.392553E+02	7.63040E+01	1.1304E+00	1.7959E+00	1.9925E-01	1.479E+00	8.903E-03
1.488640E+02	7.63392E+01	1.0107E+00	1.5022E+00	1.8684E-01	1.239E+00	8.329E-03
1.591356E+02	7.63387E+01	9.0147E-01	1.2533E+00	1.7560E-01	1.035E+00	7.791E-03

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 529

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.701159E+02	7.63318E+01	8.0410E-01	1.0458E+00	1.6540E-01	8.644E-01	7.288E-03
1.818539E+02	7.63209E+01	7.1732E-01	8.7269E-01	1.5613E-01	7.219E-01	6.818E-03
1.944018E+02	7.63072E+01	6.3996E-01	7.2832E-01	1.4769E-01	6.029E-01	6.378E-03
2.078156E+02	7.62917E+01	5.7101E-01	6.0790E-01	1.3998E-01	5.035E-01	5.966E-03
2.221548E+02	7.62751E+01	5.0952E-01	5.0743E-01	1.3292E-01	4.205E-01	5.581E-03
2.374835E+02	7.62580E+01	4.5470E-01	4.2361E-01	1.2643E-01	3.512E-01	5.221E-03
2.538699E+02	7.62408E+01	4.0581E-01	3.5366E-01	1.2046E-01	2.933E-01	4.884E-03
2.713869E+02	7.62237E+01	3.6221E-01	2.9529E-01	1.1493E-01	2.449E-01	4.569E-03
2.901126E+02	7.62068E+01	3.2332E-01	2.4657E-01	1.0979E-01	2.046E-01	4.274E-03
3.101304E+02	7.61903E+01	2.8863E-01	2.0590E-01	1.0501E-01	1.708E-01	3.998E-03
3.315294E+02	7.61742E+01	2.5880E-01	1.7271E-01	1.0053E-01	1.434E-01	3.740E-03
3.544049E+02	7.61597E+01	2.3298E-01	1.4544E-01	9.6330E-02	1.210E-01	3.498E-03
3.788588E+02	7.61466E+01	2.0976E-01	1.2250E-01	9.2368E-02	1.020E-01	3.273E-03
4.050001E+02	7.61345E+01	1.8887E-01	1.0318E-01	8.8620E-02	8.608E-02	3.061E-03
4.329451E+02	7.61234E+01	1.7007E-01	8.6910E-02	8.5062E-02	7.261E-02	2.864E-03





Ir Z = 77

Atomic weight = 1.922200E+02 g/mol, nominal density ρ (g/cm³) = 2.2390E+01 μ_a (barns/atom) = μ (cm²/g) \times 3.19189E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.18917E+05

21 edges. Edge energies (keV):

K		7.61110E+00	L	I	1.34185E+00	L	II	1.28241E+00	L	III	1.12152E+01
M	I	3.17370E+00	M	II	2.90870E+00	M	III	2.55070E+00	M	IV	2.11610E+00
M	V	2.04040E+00	N	I	6.90100E-00	N	II	5.77100E-00	N	III	4.94300E-01
N	IV	3.11400E-00	N	V	2.94900E-00	O	I	6.34000E-02	N	VI	6.05000E-02
O	II	9.52000E-02	N	VII	6.30000E-02	O	III	5.05000E-02	O	IV	8.06275E-03
O	V	6.85456E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.6105E+00, -9.4980E-01 e/atomNuclear Thomson correction f_{NT} = -1.6921E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_{κ} cm ² /g	λ nm
6.71746E-03	4.56877E+00	0.0000E+00	0.0000E+00	3.0701E-05	0.000E+00	1.846E+02
6.820284E-03	4.16587E+00	0.0000E+00	0.0000E+00	3.3158E-05	0.000E+00	1.818E+02
6.847702E-03	3.73576E+00	0.0000E+00	0.0000E+00	3.3838E-05	0.000E+00	1.811E+02
6.888830E-03	4.14282E+00	8.1569E-01	2.5921E+04	3.4878E-05	0.000E+00	1.800E+02
6.991648E-03	4.45737E+00	8.0003E 01	2.5050E+04	3.7582E 05	0.000E+00	1.773E+02
7.901491E-03	4.03188E+00	6.9950E-01	1.9380E+04	6.8946E-05	0.000E+00	1.569E+02
8.022432E-03	3.53288E+00	6.9891E-01	1.9072E+04	7.4251E-05	0.000E+00	1.545E+02
8.054683E-03	2.96880E+00	6.9931E-01	1.9006E+04	7.5716E-05	0.000E+00	1.539E+02
8.103059E-03	3.53226E+00	1.7893E+00	4.8342E+04	7.7953E-05	0.000E+00	1.530E+02
8.224000E-03	3.99314E+00	1.7635E+00	4.6942E+04	8.3762E-05	0.000E+00	1.508E+02
1.069000E-02	3.38848E+00	2.2596E+00	4.6273E+04	2.8666E-04	0.000E+00	1.160E+02
1.142761E-02	2.96561E+00	2.7630E+00	5.2931E+04	3.8716E-04	0.000E+00	1.085E+02
1.221612E-02	2.55014E+00	3.4451E+00	6.1738E+04	5.2026E-04	0.000E+00	1.015E+02
1.305903E-02	2.18886E+00	4.3234E+00	7.2476E+04	6.9563E-04	0.000E+00	9.494E+01
1.396010E-02	1.94176E+00	5.4058E+00	8.4772E+04	9.2553E-04	0.000E+00	8.881E+01
1.492335E-02	1.88002E+00	6.6815E+00	9.8015E+04	1.2253E-03	0.000E+00	8.308E+01
1.595306E-02	2.07886E+00	8.1130E+00	1.1133E+05	1.6143E-03	0.000E+00	7.772E+01
1.705382E-02	2.60570E+00	9.6315E+00	1.2364E+05	2.1165E-03	0.000E+00	7.270E+01
1.823053E-02	3.50548E+00	1.1138E+01	1.3375E+05	2.7614E-03	0.000E+00	6.801E+01
1.948844E-02	4.78653E+00	1.2515E+01	1.4058E+05	3.5854E-03	0.000E+00	6.362E+01
2.083314E-02	6.44486E+00	1.3638E+01	1.4331E+05	4.6332E-03	0.000E+00	5.951E+01
2.227063E-02	8.33051E+00	1.4402E+01	1.4157E+05	5.9588E-03	0.000E+00	5.567E+01
2.380730E-02	1.03573E+01	1.4736E+01	1.3550E+05	7.6274E-03	0.000E+00	5.208E+01
2.545001E-02	1.24238E+01	1.4616E+01	1.2572E+05	9.7174E-03	0.000E+00	4.872E+01
2.720606E-02	1.43236E+01	1.4069E+01	1.1321E+05	1.2322E-02	0.000E+00	4.557E+01
2.908327E-02	1.59807E+01	1.3163E+01	9.9084E+04	1.5553E-02	0.000E+00	4.263E+01
3.109002E-02	1.73146E+01	1.1994E+01	8.4454E+04	1.9541E-02	0.000E+00	3.988E+01
3.323523E-02	1.82867E+01	1.0670E+01	7.0284E+04	2.4439E-02	0.000E+00	3.731E+01
3.552846E-02	1.88911E+01	9.2918E+00	5.7254E+04	3.0425E-02	0.000E+00	3.490E+01
3.797993E-02	1.91469E+01	7.9469E+00	4.5806E+04	3.7706E-02	0.000E+00	3.264E+01
4.060054E-02	1.90841E+01	6.6989E+00	3.6121E+04	4.6519E-02	0.000E+00	3.054E+01
4.340198E-02	1.87149E+01	5.5846E+00	2.8168E+04	5.7137E-02	0.000E+00	2.857E+01
4.639671E-02	1.79644E+01	4.6190E+00	2.1794E+04	6.9867E-02	0.000E+00	2.672E+01
4.949000E-02	1.61569E+01	3.8261E+00	1.6925E+04	8.4518E-02	0.000E+00	2.505E+01
4.959809E-02	1.60180E+01	3.8017E+00	1.6780E+04	8.5057E-02	0.000E+00	2.500E+01
5.074750E-02	1.44719E+01	3.6588E+00	1.5941E+04	8.8337E-02	0.000E+00	2.467E+01
5.044950E-02	1.25153E+01	3.6158E+00	1.5690E+04	8.9372E-02	0.000E+00	2.458E+01
5.075250E-02	1.45315E+01	7.3654E+00	3.1770E+04	9.0935E-02	0.000E+00	2.443E+01
5.151000E-02	1.62312E+01	7.0780E+00	3.0081E+04	9.4906E-02	0.000E+00	2.407E+01
5.302035E-02	1.72269E+01	6.5492E+00	2.7041E+04	1.0310E-01	0.000E+00	2.338E+01
5.667876E-02	1.76944E+01	5.4755E+00	2.1149E+04	1.2442E-01	0.000E+00	2.187E+01
5.929000E-02	1.73548E+01	4.8462E+00	1.7894E+04	1.4091E-01	0.000E+00	2.091E+01
6.019750E-02	1.69764E+01	4.6499E+00	1.6910E+04	1.4688E-01	0.000E+00	2.060E+01
6.043950E-02	1.66584E+01	4.5994E+00	1.6660E+04	1.4849E-01	0.000E+00	2.051E+01
6.058959E-02	1.66908E+01	5.0898E+00	1.8390E+04	1.4950E-01	0.000E+00	2.046E+01
6.080250E-02	1.68392E+01	5.0424E+00	1.8155E+04	1.5093E-01	0.000E+00	2.039E+01
6.171000E-02	1.67342E+01	4.8471E+00	1.7195E+04	1.5711E-01	0.000E+00	2.009E+01
6.174000E-02	1.67231E+01	4.8408E+00	1.7164E+04	1.5732E-01	0.000E+00	2.008E+01
6.213200E-02	1.65270E+01	4.7598E+00	1.6771E+04	1.6003E-01	0.000E+00	1.995E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 533

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
6.268500E-02	1.59261E+01	4.6488E+00	1.6235E+04	1.6389E-01	0.000E+00	1.978E+01
6.293700E-02	1.49598E+01	4.5995E+00	1.5999E+04	1.6567E-01	0.000E+00	1.970E+01
6.308300E-02	1.50907E+01	6.4019E+00	2.2217E+04	1.6670E-01	0.000E+00	1.965E+01
6.333660E-02	1.57433E+01	6.3493E+00	2.1946E+04	1.6850E-01	0.000E+00	1.958E+01
6.371700E-02	1.63888E+01	6.6245E+00	2.2760E+04	1.7122E-01	0.000E+00	1.946E+01
6.426000E-02	1.68506E+01	6.5117E+00	2.2184E+04	1.7514E-01	0.000E+00	1.929E+01
6.466800E-02	1.70671E+01	6.4291E+00	2.1764E+04	1.7812E-01	0.000E+00	1.917E+01
6.477028E-02	1.71121E+01	6.4087E+00	2.1661E+04	1.7887E-01	0.000E+00	1.914E+01
6.923942E-02	1.79097E+01	5.6306E+00	1.7803E+04	2.1309E-01	0.000E+00	1.791E+01
7.401695E-02	1.80316E+01	4.9850E+00	1.4744E+04	2.5279E-01	0.000E+00	1.675E+01
7.912411E-02	1.78796E+01	4.4354E+00	1.2272E+04	2.9863E-01	0.000E+00	1.567E+01
8.458368E-02	1.75331E+01	3.9991E+00	1.0350E+04	3.5130E-01	0.000E+00	1.466E+01
9.041995E-02	1.70275E+01	3.6960E+00	8.9484E+03	4.1155E-01	0.000E+00	1.371E+01
9.329600E-02	1.67328E+01	3.6047E+00	8.4583E+03	4.4265E-01	0.000E+00	1.329E+01
9.472400E-02	1.65559E+01	3.5729E+00	8.2573E+03	4.5842E-01	0.000E+00	1.309E+01
9.510480E-02	1.64751E+01	3.5659E+00	8.2081E+03	4.6267E-01	0.000E+00	1.304E+01
9.567600E-02	1.64603E+01	3.6404E+00	8.3298E+03	4.6906E-01	0.000E+00	1.296E+01
9.665893E-02	1.63907E+01	3.6286E+00	8.2181E+03	4.8014E-01	0.000E+00	1.283E+01
9.710400E-02	1.63524E+01	3.6245E+00	8.1713E+03	4.8519E-01	0.000E+00	1.277E+01
1.033284E-01	1.57408E+01	3.6506E+00	7.7343E+03	5.5788E-01	0.000E+00	1.200E+01
1.104581E-01	1.49948E+01	3.8583E+00	7.6468E+03	6.4557E-01	0.000E+00	1.122E+01
1.180797E-01	1.41999E+01	4.2715E+00	7.9193E+03	7.4403E-01	0.000E+00	1.050E+01
1.262272E-01	1.33897E+01	4.9107E+00	8.5168E+03	8.5407E-01	0.000E+00	9.822E+00
1.349368E-01	1.26056E+01	5.7993E+00	9.4086E+03	9.7649E-01	0.000E+00	9.188E+00
1.442475E-01	1.18996E+01	6.9456E+00	1.0541E+04	1.1121E+00	0.000E+00	8.595E+00
1.542005E-01	1.13326E+01	8.3499E+00	1.1854E+04	1.2615E+00	0.000E+00	8.040E+00
1.648404E-01	1.09631E+01	9.9997E+00	1.3280E+04	1.4254E+00	0.000E+00	7.521E+00
1.762144E-01	1.08566E+01	1.1853E+01	1.4726E+04	1.6044E+00	0.000E+00	7.036E+00
1.883732E-01	1.11168E+01	1.3856E+01	1.6103E+04	1.7990E+00	0.000E+00	6.582E+00
2.013709E-01	1.17275E+01	1.5936E+01	1.7325E+04	2.0095E+00	0.000E+00	6.157E+00
2.152655E-01	1.26646E+01	1.8011E+01	1.8317E+04	2.2362E+00	0.000E+00	5.760E+00
2.301188E-01	1.39679E+01	1.9993E+01	1.9020E+04	2.4791E+00	0.000E+00	5.388E+00
2.459970E-01	1.56081E+01	2.1797E+01	1.9397E+04	2.7382E+00	0.000E+00	5.040E+00
2.629708E-01	1.75168E+01	2.3315E+01	1.9409E+04	3.0132E+00	0.000E+00	4.715E+00
2.811158E-01	1.95218E+01	2.4462E+01	1.9050E+04	3.3037E+00	0.000E+00	4.410E+00
2.890020E-01	2.02676E+01	2.4820E+01	1.8801E+04	3.4285E+00	0.000E+00	4.290E+00
2.934255E-01	2.04939E+01	2.4987E+01	1.8642E+04	3.4981E+00	0.000E+00	4.225E+00
2.946051E-01	2.03212E+01	2.5027E+01	1.8598E+04	3.5167E+00	0.000E+00	4.208E+00
2.963745E-01	2.07932E+01	2.5669E+01	1.8961E+04	3.5444E+00	0.000E+00	4.183E+00
3.005128E-01	2.14565E+01	2.5820E+01	1.8809E+04	3.6090E+00	0.000E+00	4.126E+00
3.007980E-01	2.14938E+01	2.5829E+01	1.8798E+04	3.6135E+00	0.000E+00	4.122E+00
3.051720E-01	2.20091E+01	2.5968E+01	1.8628E+04	3.6815E+00	0.000E+00	4.063E+00
3.098430E-01	2.23954E+01	2.6095E+01	1.8437E+04	3.7537E+00	0.000E+00	4.002E+00
3.110886E-01	2.23178E+01	2.6126E+01	1.8385E+04	3.7729E+00	0.000E+00	3.985E+00
3.129570E-01	2.27603E+01	2.6615E+01	1.8617E+04	3.8016E+00	0.000E+00	3.962E+00
3.176280E-01	2.34958E+01	2.6729E+01	1.8422E+04	3.8732E+00	0.000E+00	3.903E+00
3.212482E-01	2.39718E+01	2.6805E+01	1.8267E+04	3.9284E+00	0.000E+00	3.859E+00
3.434143E-01	2.65060E+01	2.7073E+01	1.7258E+04	4.2607E+00	0.000E+00	3.610E+00
3.671099E-01	2.88296E+01	2.7057E+01	1.6135E+04	4.6048E+00	0.000E+00	3.377E+00
3.924405E-01	3.09648E+01	2.6807E+01	1.4954E+04	4.9592E+00	0.000E+00	3.159E+00
4.195189E-01	3.28844E+01	2.6369E+01	1.3760E+04	5.3222E+00	0.000E+00	2.955E+00
4.484657E-01	3.45337E+01	2.5788E+01	1.2589E+04	5.6921E+00	0.000E+00	2.765E+00
4.794098E-01	3.56763E+01	2.5103E+01	1.1463E+04	6.0668E+00	0.000E+00	2.586E+00
4.844140E-01	3.57171E+01	2.4989E+01	1.1293E+04	6.1254E+00	0.000E+00	2.559E+00
4.918285E-01	3.53653E+01	2.4819E+01	1.1047E+04	6.2112E+00	0.000E+00	2.521E+00
4.938057E-01	3.46352E+01	2.4774E+01	1.0983E+04	6.2339E+00	0.000E+00	2.511E+00
4.967715E-01	3.55910E+01	2.6311E+01	1.1595E+04	6.2677E+00	0.000E+00	2.496E+00
5.041860E-01	3.66303E+01	2.6149E+01	1.1354E+04	6.3516E+00	0.000E+00	2.459E+00
5.124891E-01	3.72998E+01	2.5967E+01	1.1092E+04	6.4441E+00	0.000E+00	2.419E+00
5.478508E-01	3.91988E+01	2.5196E+01	1.0068E+04	6.8218E+00	0.000E+00	2.263E+00
5.655580E-01	3.98738E+01	2.4815E+01	9.6053E+03	7.0014E+00	0.000E+00	2.192E+00
5.742145E-01	4.00609E+01	2.4629E+01	9.3899E+03	7.0868E+00	0.000E+00	2.159E+00
5.765229E-01	3.99602E+01	2.4580E+01	9.3336E+03	7.1094E+00	0.000E+00	2.151E+00
5.799855E-01	4.02834E+01	2.4881E+01	9.3913E+03	7.1430E+00	0.000E+00	2.138E+00
5.856525E-01	4.06253E+01	2.4764E+01	9.2568E+03	7.1976E+00	0.000E+00	2.117E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
5.886420E-01	4.07709E+01	2.4703E+01	9.1870E+03	7.2261E+00	0.000E+00	2.106E+00
6.260625E-01	4.21852E+01	2.3949E+01	8.3744E+03	7.5688E+00	0.000E+00	1.980E+00
6.692609E-01	4.33640E+01	2.3113E+01	7.5603E+03	7.9331E+00	0.000E+00	1.853E+00
6.762980E-01	4.34936E+01	2.2980E+01	7.4387E+03	7.9894E+00	0.000E+00	1.833E+00
6.866495E-01	4.35397E+01	2.2787E+01	7.2649E+03	8.0707E+00	0.000E+00	1.806E+00
6.894099E-01	4.33370E+01	2.2735E+01	7.2195E+03	8.0921E+00	0.000E+00	1.798E+00
6.935505E-01	4.37221E+01	2.3199E+01	7.3227E+03	8.1239E+00	0.000E+00	1.788E+00
7.039020E-01	4.42262E+01	2.3011E+01	7.1567E+03	8.2024E+00	0.000E+00	1.761E+00
7.154399E-01	4.46162E+01	2.2805E+01	6.9780E+03	8.2878E+00	0.000E+00	1.733E+00
7.648052E-01	4.59038E+01	2.1951E+01	6.2831E+03	8.6304E+00	0.000E+00	1.621E+00
8.175768E-01	4.69914E+01	2.1088E+01	5.6466E+03	8.9584E+00	0.000E+00	1.516E+00
8.739896E-01	4.79478E+01	2.0212E+01	5.0627E+03	9.2694E+00	0.000E+00	1.419E+00
9.342948E-01	4.88033E+01	1.9331E+01	4.5295E+03	9.5611E+00	0.000E+00	1.327E+00
9.987612E-01	4.95382E+01	1.8454E+01	4.0448E+03	9.8313E+00	0.000E+00	1.241E+00
1.067676E+00	5.02308E+01	1.7329E+01	3.5532E+03	1.0078E+01	0.000E+00	1.161E+00
1.141345E+00	5.06511E+01	1.6255E+01	3.1178E+03	1.0299E+01	0.000E+00	1.086E+00
1.220098E+00	5.08336E+01	1.5060E+01	2.7021E+03	1.0494E+01	0.000E+00	1.016E+00
1.304285E+00	5.06688E+01	1.3822E+01	2.3199E+03	1.0659E+01	0.000E+00	9.506E-01
1.394281E+00	5.01226E+01	1.2695E+01	1.9932E+03	1.0796E+01	0.000E+00	8.892E-01
1.490486E+00	4.91604E+01	1.1689E+01	1.7169E+03	1.0902E+01	0.000E+00	8.318E-01
1.593329E+00	4.76193E+01	1.0789E+01	1.4824E+03	1.0977E+01	0.000E+00	7.781E-01
1.703269E+00	4.51149E+01	9.9820E+00	1.2830E+03	1.1021E+01	0.000E+00	7.279E-01
1.820795E+00	4.05332E+01	9.2563E+00	1.1129E+03	1.1033E+01	0.000E+00	6.809E-01
1.946430E+00	2.85840E+01	8.6020E+00	9.6747E+02	1.1014E+01	0.000E+00	6.370E-01
1.999592E+00	1.27740E+01	8.3518E+00	9.1437E+02	1.0998E+01	0.000E+00	6.200E-01
2.030198E+00	-2.26719E+01	8.2119E+00	8.8550E+02	1.0987E+01	0.000E+00	6.107E-01
2.038360E+00	-7.68356E+01	8.1755E+00	8.7804E+02	1.0983E+01	0.000E+00	6.083E-01
2.050602E+00	7.65240E+00	1.1386E+02	1.2155E+04	1.0978E+01	0.000E+00	6.046E-01
2.073778E+00	4.92210E+01	7.2821E+01	7.6874E+03	1.0968E+01	0.000E+00	5.979E-01
2.080733E+00	5.10250E+01	6.3996E+01	6.7332E+03	1.0965E+01	0.000E+00	5.959E-01
2.081208E+00	5.10524E+01	6.3440E+01	6.6732E+03	1.0965E+01	0.000E+00	5.957E-01
2.105520E+00	3.47380E+01	4.1321E+01	4.2963E+03	1.0953E+01	0.000E+00	5.889E-01
2.113984E+00	-2.67086E+00	3.5975E+01	3.7203E+03	1.0949E+01	0.000E+00	5.865E-01
2.126681E+00	5.52137E+01	1.0232E+02	1.0532E+04	1.0942E+01	0.000E+00	5.830E-01
2.158422E+00	8.34816E+01	5.9333E+01	6.0178E+03	1.0925E+01	0.000E+00	5.744E-01
2.224304E+00	7.40946E+01	2.7411E+01	2.6978E+03	1.0886E+01	0.000E+00	5.574E-01
2.377781E+00	5.96008E+01	2.2102E+01	2.0349E+03	1.0777E+01	0.000E+00	5.214E-01
2.499686E+00	5.57276E+01	2.3178E+01	2.0299E+03	1.0678E+01	0.000E+00	4.960E-01
2.537946E+00	5.36714E+01	2.3675E+01	2.0421E+03	1.0645E+01	0.000E+00	4.885E-01
2.541848E+00	5.31402E+01	2.3726E+01	2.0434E+03	1.0641E+01	0.000E+00	4.878E-01
2.548149E+00	5.12987E+01	2.3809E+01	2.0454E+03	1.0636E+01	0.000E+00	4.866E-01
2.563453E+00	5.38033E+01	2.8729E+01	2.4535E+03	1.0622E+01	0.000E+00	4.837E-01
2.601714E+00	5.63253E+01	2.9072E+01	2.4462E+03	1.0588E+01	0.000E+00	4.765E-01
2.717235E+00	6.01416E+01	2.9268E+01	2.3580E+03	1.0479E+01	0.000E+00	4.563E-01
2.850526E+00	6.29291E+01	2.7803E+01	2.1352E+03	1.0347E+01	0.000E+00	4.350E-01
2.894156E+00	6.29433E+01	2.7151E+01	2.0537E+03	1.0303E+01	0.000E+00	4.284E-01
2.904724E+00	6.23671E+01	2.6990E+01	2.0341E+03	1.0292E+01	0.000E+00	4.268E-01
2.905791E+00	6.22022E+01	2.6973E+01	2.0321E+03	1.0291E+01	0.000E+00	4.267E-01
2.923243E+00	6.34138E+01	2.8526E+01	2.1362E+03	1.0273E+01	0.000E+00	4.241E-01
2.966874E+00	6.47903E+01	2.7772E+01	2.0492E+03	1.0228E+01	0.000E+00	4.179E-01
3.105150E+00	6.64341E+01	2.5836E+01	1.8215E+03	1.0082E+01	0.000E+00	3.993E-01
3.110226E+00	6.64660E+01	2.5774E+01	1.8141E+03	1.0076E+01	0.000E+00	3.986E-01
3.157832E+00	6.64977E+01	2.5205E+01	1.7473E+03	1.0025E+01	0.000E+00	3.926E-01
3.170526E+00	6.60588E+01	2.5057E+01	1.7301E+03	1.0012E+01	0.000E+00	3.911E-01
3.189569E+00	6.68111E+01	2.5948E+01	1.7810E+03	9.9910E+00	0.000E+00	3.887E-01
3.237174E+00	6.77416E+01	2.5408E+01	1.7183E+03	9.9395E+00	0.000E+00	3.830E-01
3.319406E+00	6.87048E+01	2.4519E+01	1.6170E+03	9.8502E+00	0.000E+00	3.735E-01
3.548445E+00	7.04365E+01	2.2260E+01	1.3733E+03	9.5995E+00	0.000E+00	3.494E-01
3.793288E+00	7.15876E+01	2.0195E+01	1.1655E+03	9.3317E+00	0.000E+00	3.269E-01
4.055024E+00	7.24156E+01	1.8361E+01	9.9126E+02	9.0488E+00	0.000E+00	3.058E-01
4.334821E+00	7.33710E+01	1.6588E+01	8.3772E+02	8.7528E+00	0.000E+00	2.860E-01
4.633924E+00	7.37302E+01	1.4961E+01	7.0680E+02	8.4461E+00	0.000E+00	2.676E-01
4.953664E+00	7.39313E+01	1.3521E+01	5.9756E+02	8.1306E+00	0.000E+00	2.503E-01
5.295467E+00	7.41353E+01	1.2216E+01	5.0500E+02	7.8084E+00	0.000E+00	2.341E-01
5.660855E+00	7.41393E+01	1.1031E+01	4.2659E+02	7.4816E+00	0.000E+00	2.190E-01

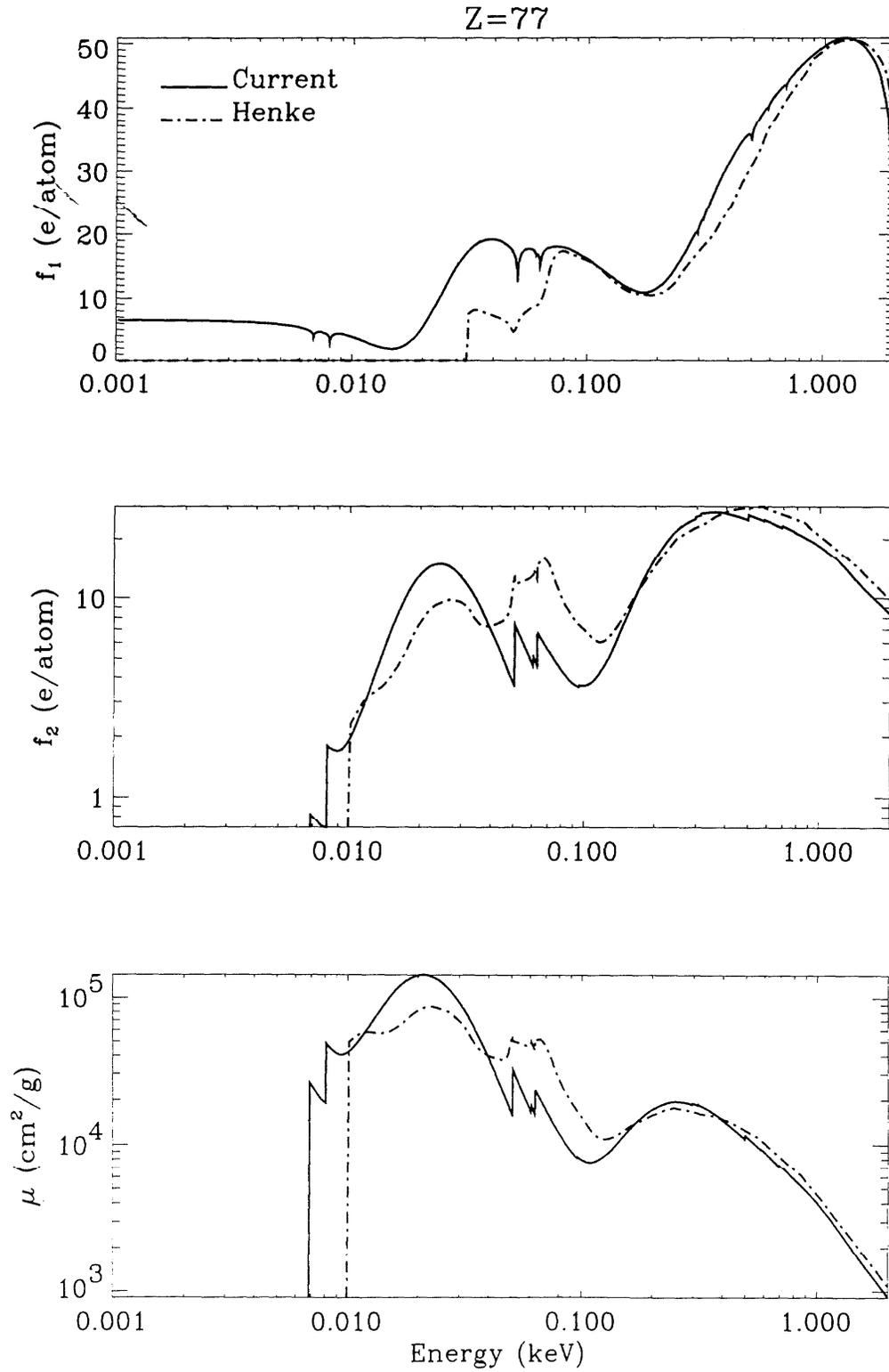
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 535

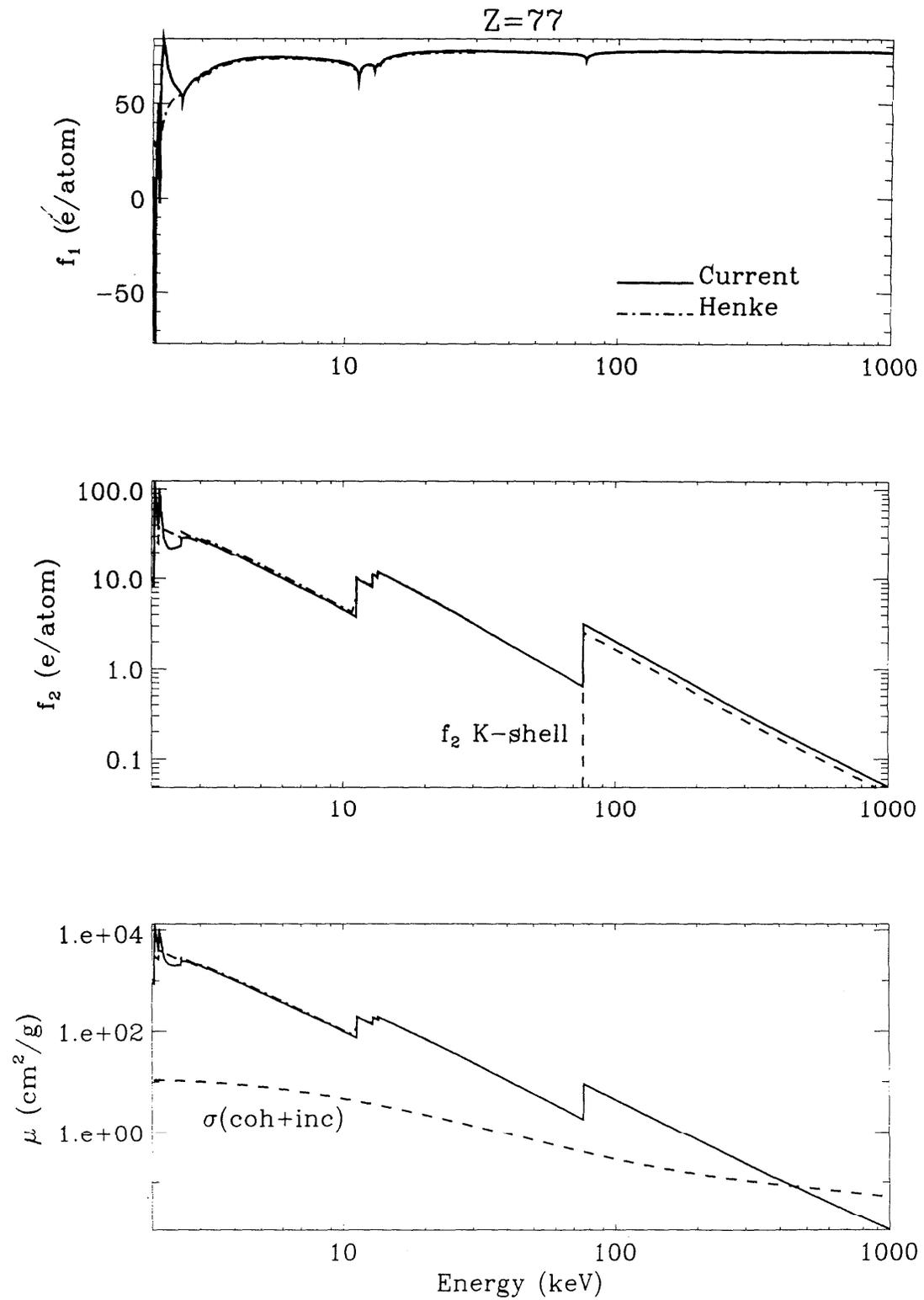
TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
6.051453E+00	7.41150E+01	9.9528E+00	3.6005E+02	7.1519E+00	0.000E+00	2.049E-01
6.469004E+00	7.39918E+01	8.9802E+00	3.0390E+02	6.8214E+00	0.000E+00	1.917E-01
6.915365E+00	7.37906E+01	8.1107E+00	2.5676E+02	6.4917E+00	0.000E+00	1.793E-01
7.392525E+00	7.35347E+01	7.3369E+00	2.1727E+02	6.1644E+00	0.000E+00	1.677E-01
7.902609E+00	7.32237E+01	6.6471E+00	1.8414E+02	5.8411E+00	0.000E+00	1.569E-01
8.447890E+00	7.28479E+01	6.0315E+00	1.5630E+02	5.5230E+00	0.000E+00	1.468E-01
9.030794E+00	7.23985E+01	5.4576E+00	1.3279E+02	5.2114E+00	0.000E+00	1.373E-01
9.653919E+00	7.17147E+01	4.8670E+00	1.1057E+02	4.9074E+00	0.000E+00	1.284E-01
1.032004E+01	7.05598E+01	4.3460E+00	9.2191E+01	4.6119E+00	0.000E+00	1.201E-01
1.099090E+01	6.77771E+01	3.9125E+00	7.7929E+01	4.3416E+00	0.000E+00	1.128E-01
1.103212E+01	6.57379E+01	3.8882E+00	7.7156E+01	4.3258E+00	0.000E+00	1.124E-01
1.115912E+01	6.50235E+01	3.8127E+00	7.4796E+01	4.2777E+00	0.000E+00	1.111E-01
1.120399E+01	6.18030E+01	3.7864E+00	7.3984E+01	4.2609E+00	0.000E+00	1.107E-01
1.127128E+01	6.50010E+01	1.0038E+01	1.9496E+02	4.2359E+00	0.000E+00	1.100E-01
1.143950E+01	6.78144E+01	9.7835E+00	1.8723E+02	4.1743E+00	0.000E+00	1.084E-01
1.179334E+01	6.95633E+01	9.2813E+00	1.7229E+02	4.0497E+00	0.000E+00	1.051E-01
1.256762E+01	6.98713E+01	8.3062E+00	1.4469E+02	3.7965E+00	0.000E+00	9.865E-02
1.260708E+01	6.97514E+01	8.2608E+00	1.4345E+02	3.7842E+00	0.000E+00	9.834E-02
1.275998E+01	6.86840E+01	8.0870E+00	1.3875E+02	3.7374E+00	0.000E+00	9.717E-02
1.281128E+01	6.71004E+01	8.0300E+00	1.3722E+02	3.7219E+00	0.000E+00	9.678E-02
1.288822E+01	6.87619E+01	1.1120E+01	1.8888E+02	3.6989E+00	0.000E+00	9.620E-02
1.308058E+01	7.02336E+01	1.0842E+01	1.8145E+02	3.6422E+00	0.000E+00	9.478E-02
1.315013E+01	7.04517E+01	1.0744E+01	1.7886E+02	3.6221E+00	0.000E+00	9.428E-02
1.335141E+01	7.04642E+01	1.0468E+01	1.7164E+02	3.5648E+00	0.000E+00	9.286E-02
1.340508E+01	6.97841E+01	1.0396E+01	1.6978E+02	3.5497E+00	0.000E+00	9.249E-02
1.347697E+01	7.07259E+01	1.1938E+01	1.9391E+02	3.5298E+00	0.000E+00	9.200E-02
1.348559E+01	7.08202E+01	1.1926E+01	1.9360E+02	3.5274E+00	0.000E+00	9.194E-02
1.368687E+01	7.20088E+01	1.1656E+01	1.8643E+02	3.4724E+00	0.000E+00	9.059E-02
1.440688E+01	7.38230E+01	1.0762E+01	1.6353E+02	3.2866E+00	0.000E+00	8.606E-02
1.540095E+01	7.50940E+01	9.6762E+00	1.3754E+02	3.0550E+00	0.000E+00	8.050E-02
1.646362E+01	7.58828E+01	8.6962E+00	1.1563E+02	2.8351E+00	0.000E+00	7.531E-02
1.759961E+01	7.64106E+01	7.8074E+00	9.7114E+01	2.6269E+00	0.000E+00	7.045E-02
1.881398E+01	7.67621E+01	7.0052E+00	8.1511E+01	2.4302E+00	0.000E+00	6.590E-02
2.011215E+01	7.69951E+01	6.2881E+00	6.8445E+01	2.2450E+00	0.000E+00	6.165E-02
2.149988E+01	7.71466E+01	5.6474E+00	5.7503E+01	2.0711E+00	0.000E+00	5.767E-02
2.298338E+01	7.73024E+01	5.0712E+00	4.8304E+01	1.9082E+00	0.000E+00	5.395E-02
2.456923E+01	7.73502E+01	4.5513E+00	4.0554E+01	1.7560E+00	0.000E+00	5.046E-02
2.626450E+01	7.74048E+01	4.0864E+00	3.4061E+01	1.6141E+00	0.000E+00	4.721E-02
2.807676E+01	7.74354E+01	3.6367E+00	2.8356E+01	1.4821E+00	0.000E+00	4.416E-02
3.001405E+01	7.73918E+01	3.2288E+00	2.3550E+01	1.3597E+00	0.000E+00	4.131E-02
3.208502E+01	7.73244E+01	2.8690E+00	1.9575E+01	1.2464E+00	0.000E+00	3.864E-02
3.429889E+01	7.72424E+01	2.5514E+00	1.6285E+01	1.1417E+00	0.000E+00	3.615E-02
3.666551E+01	7.71510E+01	2.2709E+00	1.3559E+01	1.0452E+00	0.000E+00	3.381E-02
3.919543E+01	7.70532E+01	2.0228E+00	1.1298E+01	9.5642E-01	0.000E+00	3.163E-02
4.189992E+01	7.69504E+01	1.8034E+00	9.4223E+00	8.7493E-01	0.000E+00	2.959E-02
4.479101E+01	7.68433E+01	1.6090E+00	7.8640E+00	8.0026E-01	0.000E+00	2.768E-02
4.788159E+01	7.67310E+01	1.4365E+00	6.5679E+00	7.3196E-01	0.000E+00	2.589E-02
5.118542E+01	7.66111E+01	1.2811E+00	5.4793E+00	6.6959E-01	0.000E+00	2.422E-02
5.471721E+01	7.64779E+01	1.1430E+00	4.5729E+00	6.1274E-01	0.000E+00	2.266E-02
5.849270E+01	7.63242E+01	1.0186E+00	3.8121E+00	5.6100E-01	0.000E+00	2.120E-02
6.252870E+01	7.61313E+01	9.0442E-01	3.1664E+00	5.1398E-01	0.000E+00	1.983E-02
6.684318E+01	7.58591E+01	8.0341E-01	2.6312E+00	4.7130E-01	0.000E+00	1.855E-02
7.145536E+01	7.53720E+01	7.1368E-01	2.1865E+00	4.3261E-01	0.000E+00	1.735E-02
7.458878E+01	7.45466E+01	6.6151E-01	1.9415E+00	4.0968E-01	0.000E+00	1.662E-02
7.573045E+01	7.34668E+01	6.4402E-01	1.8617E+00	4.0191E-01	0.000E+00	1.637E-02
7.603489E+01	7.21743E+01	6.3949E-01	1.8412E+00	3.9989E-01	0.000E+00	1.631E-02
7.638578E+01	7.32084E+01	3.1835E+00	9.1237E+00	3.9758E-01	7.306E+00	1.623E-02
7.649156E+01	7.34802E+01	3.1769E+00	9.0923E+00	3.9689E-01	7.281E+00	1.621E-02
7.763322E+01	7.46592E+01	3.1075E+00	8.7628E+00	3.8960E-01	7.024E+00	1.597E-02
8.165640E+01	7.58030E+01	2.8740E+00	7.7050E+00	3.6590E-01	6.196E+00	1.518E-02
8.729069E+01	7.64034E+01	2.5766E+00	6.4619E+00	3.3726E-01	5.216E+00	1.420E-02
9.331374E+01	7.67318E+01	2.3102E+00	5.4198E+00	3.1140E-01	4.390E+00	1.329E-02
9.975239E+01	7.69419E+01	2.0719E+00	4.5469E+00	2.8805E-01	3.695E+00	1.243E-02
1.066353E+02	7.70807E+01	1.8524E+00	3.8029E+00	2.6699E-01	3.098E+00	1.163E-02
1.139931E+02	7.71722E+01	1.6564E+00	3.1810E+00	2.4797E-01	2.598E+00	1.088E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.218587E+02	7.72324E+01	1.4813E+00	2.6612E+00	2.3081E-01	2.178E+00	1.017E-02
1.302669E+02	7.72708E+01	1.3250E+00	2.2267E+00	2.1532E-01	1.826E+00	9.518E-03
1.392553E+02	7.72938E+01	1.1853E+00	1.8633E+00	2.0133E-01	1.531E+00	8.903E-03
1.488640E+02	7.73058E+01	1.0604E+00	1.5594E+00	1.8867E-01	1.283E+00	8.329E-03
1.591356E+02	7.73357E+01	9.4708E-01	1.3029E+00	1.7721E-01	1.074E+00	7.791E-03
1.701159E+02	7.73314E+01	8.4519E-01	1.0876E+00	1.6682E-01	8.971E-01	7.288E-03
1.818539E+02	7.73223E+01	7.5434E-01	9.0808E-01	1.5738E-01	7.497E-01	6.818E-03
1.944018E+02	7.73099E+01	6.7332E-01	7.5823E-01	1.4879E-01	6.264E-01	6.378E-03
2.078156E+02	7.72953E+01	6.0105E-01	6.3316E-01	1.4095E-01	5.235E-01	5.966E-03
2.221548E+02	7.72794E+01	5.3660E-01	5.2878E-01	1.3377E-01	4.374E-01	5.581E-03
2.374835E+02	7.72627E+01	4.7910E-01	4.4164E-01	1.2718E-01	3.655E-01	5.221E-03
2.538699E+02	7.72457E+01	4.2779E-01	3.6890E-01	1.2112E-01	3.054E-01	4.884E-03
2.713869E+02	7.72287E+01	3.8202E-01	3.0816E-01	1.1551E-01	2.552E-01	4.569E-03
2.901126E+02	7.72119E+01	3.4117E-01	2.5744E-01	1.1031E-01	2.133E-01	4.274E-03
3.101304E+02	7.71954E+01	3.0471E-01	2.1509E-01	1.0547E-01	1.782E-01	3.998E-03
3.315294E+02	7.71791E+01	2.7235E-01	1.7984E-01	1.0094E-01	1.490E-01	3.740E-03
3.544049E+02	7.71640E+01	2.4539E-01	1.5158E-01	9.6700E-02	1.258E-01	3.498E-03
3.788588E+02	7.71505E+01	2.2112E-01	1.2777E-01	9.2704E-02	1.063E-01	3.273E-03
4.050001E+02	7.71381E+01	1.9926E-01	1.0771E-01	8.8928E-02	8.971E-02	3.061E-03
4.329451E+02	7.71268E+01	1.7958E-01	9.0804E-02	8.5347E-02	7.575E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 539

Pt Z = 78

Atomic weight = 1.950800E+02 g/mol, nominal density ρ (g/cm³) = 2.1410E+01

μ_0 (barns/atom) = $\mu_0(\text{cm}^2/\text{g}) \times 3.23938\text{E}+02$, E (eV) $\mu_0(\text{cm}^2/\text{g}) = f_2(\text{e}/\text{atom}) \times 2.15708\text{E}+05$

21 edges. Edge energies (keV):

K		7.83948E+00	L	I	1.38799E+00	L	II	1.32726E+00	L	III	1.15637E+01
M	I	3.29600E+00	M	II	3.02650E+00	M	III	2.64540E+00	M	IV	2.20190E+00
M	V	2.12160E+00	N	I	7.22000E-00	N	II	6.09200E-00	N	III	5.19000E-01
N	IV	3.30860E-00	N	V	3.13300E-00	O	I	7.43000E-02	N	VI	7.11000E-02
N	VII	1.01700E-00	O	II	6.53000E-02	O	III	5.17000E-02	O	IV	7.43991E-03
O	V	6.12538E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.6659E+00, -9.8160E-01 e/atom

Nuclear Thomson correction f_{NT} = -1.7109E-02 e/atom

<i>E</i> keV	<i>f</i> ₁ e/atom	<i>f</i> ₂ e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.002872E-03	3.45968E+00	0.0000E+00	0.0000E+00	1.6617E-05	0.000E+00	2.065E+02
6.094753E-03	2.90784E+00	0.0000E+00	0.0000E+00	1.7989E-05	0.000E+00	2.034E+02
6.119254E-03	2.30428E+00	0.0000E+00	0.0000E+00	1.8369E-05	0.000E+00	2.026E+02
6.156007E-03	2.88178E+00	1.1551E+00	4.0474E+04	1.8950E-05	0.000E+00	2.014E+02
6.247887E-03	3.34662E+00	1.1481E+00	3.9638E+04	2.0465E-05	0.000E+00	1.984E+02
7.291108E-03	3.09785E+00	1.1299E+00	3.3428E+04	4.4924E-05	0.000E+00	1.700E+02
7.402706E-03	2.65794E+00	1.1443E+00	3.3345E+04	4.8462E-05	0.000E+00	1.675E+02
7.432466E-03	2.16631E+00	1.1487E+00	3.3339E+04	4.9441E-05	0.000E+00	1.668E+02
7.477105E-03	2.64967E+00	2.1018E+00	6.0636E+04	5.0935E-05	0.000E+00	1.658E+02
7.588704E-03	3.04264E+00	2.1026E+00	5.9765E+04	5.4821E-05	0.000E+00	1.634E+02
1.069000E-02	2.24208E+00	3.6800E+00	7.4256E+04	2.7959E-04	0.000E+00	1.160E+02
1.142761E-02	1.99002E+00	4.4201E+00	8.3433E+04	3.7801E-04	0.000E+00	1.085E+02
1.221612E-02	1.81942E+00	5.3113E+00	9.3785E+04	5.0851E-04	0.000E+00	1.015E+02
1.305903E-02	1.77552E+00	6.3469E+00	1.0484E+05	6.8064E-04	0.000E+00	9.494E+01
1.396010E-02	1.90630E+00	7.5068E+00	1.1599E+05	9.0651E-04	0.000E+00	8.881E+01
1.492335E-02	2.25771E+00	8.7543E+00	1.2654E+05	1.2014E-03	0.000E+00	8.308E+01
1.595306E-02	2.86702E+00	1.0035E+01	1.3569E+05	1.5843E-03	0.000E+00	7.772E+01
1.705382E-02	3.75549E+00	1.1280E+01	1.4268E+05	2.0792E-03	0.000E+00	7.270E+01
1.823053E-02	4.92172E+00	1.2411E+01	1.4685E+05	2.7153E-03	0.000E+00	6.801E+01
1.948844E-02	6.40179E+00	1.3349E+01	1.4775E+05	3.5290E-03	0.000E+00	6.362E+01
2.083314E-02	8.01344E+00	1.4024E+01	1.4520E+05	4.5645E-03	0.000E+00	5.951E+01
2.227063E-02	9.74487E+00	1.4387E+01	1.3935E+05	5.8757E-03	0.000E+00	5.567E+01
2.380730E-02	1.15501E+01	1.4416E+01	1.3062E+05	7.5277E-03	0.000E+00	5.208E+01
2.545001E-02	1.32561E+01	1.4117E+01	1.1965E+05	9.5989E-03	0.000E+00	4.872E+01
2.720606E-02	1.48194E+01	1.3517E+01	1.0717E+05	1.2183E-02	0.000E+00	4.557E+01
2.908327E-02	1.61720E+01	1.2675E+01	9.4012E+04	1.5390E-02	0.000E+00	4.263E+01
3.109002E-02	1.72718E+01	1.1661E+01	8.0908E+04	1.9351E-02	0.000E+00	3.988E+01
3.323523E-02	1.80957E+01	1.0543E+01	6.8426E+04	2.4221E-02	0.000E+00	3.731E+01
3.552846E-02	1.86414E+01	9.3903E+00	5.7012E+04	3.0178E-02	0.000E+00	3.490E+01
3.797993E-02	1.89220E+01	8.2613E+00	4.6920E+04	3.7429E-02	0.000E+00	3.264E+01
4.060054E-02	1.89530E+01	7.1971E+00	3.8238E+04	4.6214E-02	0.000E+00	3.054E+01
4.340198E-02	1.87355E+01	6.2238E+00	3.0932E+04	5.6804E-02	0.000E+00	2.857E+01
4.639671E-02	1.82131E+01	5.3545E+00	2.4894E+04	6.9511E-02	0.000E+00	2.672E+01
4.959809E-02	1.70219E+01	4.5923E+00	1.9973E+04	8.4684E-02	0.000E+00	2.500E+01
5.066600E-02	1.61027E+01	4.3714E+00	1.8611E+04	9.0111E-02	0.000E+00	2.447E+01
5.144150E-02	1.42792E+01	4.2200E+00	1.7696E+04	9.4166E-02	0.000E+00	2.410E+01
5.164830E-02	1.21130E+01	4.1809E+00	1.7462E+04	9.5263E-02	0.000E+00	2.401E+01
5.195850E-02	1.43873E+01	8.3732E+00	3.4762E+04	9.6922E-02	0.000E+00	2.386E+01
5.273400E-02	1.63401E+01	8.0731E+00	3.3023E+04	1.0114E-01	0.000E+00	2.351E+01
5.302035E-02	1.66791E+01	7.9662E+00	3.2410E+04	1.0272E-01	0.000E+00	2.338E+01
5.667876E-02	1.82365E+01	6.7610E+00	2.5731E+04	1.2404E-01	0.000E+00	2.187E+01
6.058959E-02	1.83622E+01	5.7339E+00	2.0414E+04	1.4915E-01	0.000E+00	2.046E+01
6.399400E-02	1.76527E+01	5.0073E+00	1.6838E+04	1.7291E-01	0.000E+00	1.931E+01
6.477028E-02	1.70874E+01	4.8606E+00	1.6187E+04	1.7857E-01	0.000E+00	1.914E+01
6.497350E-02	1.67849E+01	4.8232E+00	1.6013E+04	1.8007E-01	0.000E+00	1.908E+01
6.523470E-02	1.57840E+01	4.7758E+00	1.5792E+04	1.8200E-01	0.000E+00	1.901E+01
6.562650E-02	1.67772E+01	6.6487E+00	2.1854E+04	1.8492E-01	0.000E+00	1.889E+01
6.606000E-02	1.76018E+01	6.4648E+00	2.0937E+04	1.9231E-01	0.000E+00	1.861E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.923942E-02	1.80672E+01	6.0159E+00	1.8742E+04	2.1288E-01	0.000E+00	1.791E+01
6.967800E-02	1.80661E+01	5.9470E+00	1.8411E+04	2.1640E-01	0.000E+00	1.779E+01
7.074450E-02	1.78893E+01	5.7860E+00	1.7642E+04	2.2508E-01	0.000E+00	1.753E+01
7.102890E-02	1.75907E+01	5.7446E+00	1.7446E+04	2.2742E-01	0.000E+00	1.746E+01
7.145550E-02	1.79428E+01	6.3025E+00	1.9026E+04	2.3095E-01	0.000E+00	1.735E+01
7.252200E-02	1.82507E+01	6.1304E+00	1.8234E+04	2.3989E-01	0.000E+00	1.710E+01
7.281400E-02	1.82857E+01	6.0840E+00	1.8023E+04	2.4237E-01	0.000E+00	1.703E+01
7.392850E-02	1.82725E+01	5.9091E+00	1.7241E+04	2.5193E-01	0.000E+00	1.677E+01
7.401695E-02	1.82476E+01	5.8954E+00	1.7181E+04	2.5269E-01	0.000E+00	1.675E+01
7.422570E-02	1.80963E+01	5.8631E+00	1.7039E+04	2.5451E-01	0.000E+00	1.670E+01
7.467150E-02	1.83595E+01	6.2059E+00	1.7927E+04	2.5839E-01	0.000E+00	1.660E+01
7.578600E-02	1.86350E+01	6.0247E+00	1.7148E+04	2.6823E-01	0.000E+00	1.636E+01
7.912411E-02	1.89032E+01	5.5118E+00	1.5026E+04	2.9869E-01	0.000E+00	1.567E+01
8.458368E-02	1.88750E+01	4.8128E+00	1.2274E+04	3.5159E-01	0.000E+00	1.466E+01
9.041995E-02	1.85797E+01	4.2658E+00	1.0177E+04	4.1213E-01	0.000E+00	1.371E+01
9.665893E-02	1.81081E+01	3.8676E+00	8.6311E+03	4.8110E-01	0.000E+00	1.283E+01
9.966600E-02	1.78325E+01	3.7348E+00	8.0833E+03	5.1581E-01	0.000E+00	1.244E+01
1.011915E-01	1.76603E+01	3.6809E+00	7.8465E+03	5.3376E-01	0.000E+00	1.225E+01
1.015983E-01	1.75791E+01	3.6680E+00	7.7876E+03	5.3859E-01	0.000E+00	1.220E+01
1.022085E-01	1.75688E+01	3.7376E+00	7.8881E+03	5.4586E-01	0.000E+00	1.213E+01
1.033284E-01	1.74993E+01	3.7087E+00	7.7422E+03	5.5930E-01	0.000E+00	1.200E+01
1.037340E-01	1.74683E+01	3.6993E+00	7.6924E+03	5.6420E-01	0.000E+00	1.195E+01
1.104581E-01	1.68687E+01	3.6250E+00	7.0791E+03	6.4757E-01	0.000E+00	1.122E+01
1.180797E-01	1.61244E+01	3.7183E+00	6.7926E+03	7.4673E-01	0.000E+00	1.050E+01
1.262272E-01	1.53098E+01	4.0106E+00	6.8537E+03	8.5762E-01	0.000E+00	9.822E+00
1.349368E-01	1.44497E+01	4.5188E+00	7.2236E+03	9.8105E-01	0.000E+00	9.188E+00
1.442475E-01	1.35764E+01	5.2758E+00	7.8894E+03	1.1178E+00	0.000E+00	8.595E+00
1.542005E-01	1.27388E+01	6.3070E+00	8.8227E+03	1.2686E+00	0.000E+00	8.040E+00
1.648404E-01	1.20002E+01	7.6233E+00	9.9757E+03	1.4341E+00	0.000E+00	7.521E+00
1.762144E-01	1.14223E+01	9.2248E+00	1.1292E+04	1.6150E+00	0.000E+00	7.036E+00
1.883732E-01	1.10854E+01	1.1089E+01	1.2699E+04	1.8117E+00	0.000E+00	6.582E+00
2.013709E-01	1.10666E+01	1.3170E+01	1.4107E+04	2.0245E+00	0.000E+00	6.157E+00
2.152655E-01	1.14312E+01	1.5392E+01	1.5424E+04	2.2538E+00	0.000E+00	5.760E+00
2.301188E-01	1.21856E+01	1.7665E+01	1.6559E+04	2.4997E+00	0.000E+00	5.388E+00
2.459970E-01	1.33649E+01	1.9883E+01	1.7435E+04	2.7620E+00	0.000E+00	5.040E+00
2.629708E-01	1.49325E+01	2.1941E+01	1.7997E+04	3.0406E+00	0.000E+00	4.715E+00
2.811158E-01	1.68186E+01	2.3742E+01	1.8218E+04	3.3350E+00	0.000E+00	4.410E+00
3.005128E-01	1.88722E+01	2.5194E+01	1.8084E+04	3.6445E+00	0.000E+00	4.126E+00
3.070340E-01	1.94815E+01	2.5567E+01	1.7962E+04	3.7472E+00	0.000E+00	4.038E+00
3.111733E-01	1.97467E+01	2.5802E+01	1.7854E+04	3.8208E+00	0.000E+00	3.977E+00
3.129867E-01	1.95919E+01	2.5860E+01	1.7822E+04	3.8403E+00	0.000E+00	3.961E+00
3.148665E-01	2.00670E+01	2.6509E+01	1.8161E+04	3.8696E+00	0.000E+00	3.938E+00
3.195660E-01	2.07951E+01	2.6733E+01	1.8045E+04	3.9424E+00	0.000E+00	3.880E+00
3.212482E-01	2.10057E+01	2.6807E+01	1.8000E+04	3.9684E+00	0.000E+00	3.859E+00
3.241840E-01	2.13431E+01	2.6930E+01	1.7919E+04	4.0136E+00	0.000E+00	3.825E+00
3.291460E-01	2.17758E+01	2.7116E+01	1.7771E+04	4.0897E+00	0.000E+00	3.767E+00
3.304692E-01	2.17179E+01	2.7161E+01	1.7729E+04	4.1099E+00	0.000E+00	3.752E+00
3.324540E-01	2.21665E+01	2.7655E+01	1.7944E+04	4.1401E+00	0.000E+00	3.729E+00
3.374160E-01	2.29359E+01	2.7824E+01	1.7788E+04	4.2153E+00	0.000E+00	3.675E+00
3.434143E-01	2.37157E+01	2.8001E+01	1.7588E+04	4.3056E+00	0.000E+00	3.610E+00
3.671099E-01	2.64497E+01	2.8433E+01	1.6707E+04	4.6548E+00	0.000E+00	3.377E+00
3.924405E-01	2.90098E+01	2.8517E+01	1.5674E+04	5.0147E+00	0.000E+00	3.159E+00
4.195189E-01	3.13791E+01	2.8305E+01	1.4554E+04	5.3834E+00	0.000E+00	2.955E+00
4.484657E-01	3.35086E+01	2.7854E+01	1.3398E+04	5.7592E+00	0.000E+00	2.765E+00
4.794098E-01	3.53128E+01	2.7220E+01	1.2248E+04	6.1401E+00	0.000E+00	2.586E+00
5.086200E-01	3.62971E+01	2.6543E+01	1.1257E+04	6.4801E+00	0.000E+00	2.438E+00
5.124891E-01	3.62545E+01	2.6450E+01	1.1133E+04	6.5238E+00	0.000E+00	2.419E+00
5.164050E-01	3.59697E+01	2.6355E+01	1.1009E+04	6.5676E+00	0.000E+00	2.401E+00
5.184810E-01	3.52238E+01	2.6305E+01	1.0944E+04	6.5907E+00	0.000E+00	2.391E+00
5.215950E-01	3.62272E+01	2.7890E+01	1.1534E+04	6.6252E+00	0.000E+00	2.377E+00
5.293800E-01	3.73362E+01	2.7708E+01	1.1290E+04	6.7106E+00	0.000E+00	2.342E+00
5.478508E-01	3.87147E+01	2.7271E+01	1.0738E+04	6.9080E+00	0.000E+00	2.263E+00
5.856525E-01	4.06076E+01	2.6375E+01	9.7144E+03	7.2903E+00	0.000E+00	2.117E+00
5.970160E-01	4.10302E+01	2.6107E+01	9.4329E+03	7.3997E+00	0.000E+00	2.077E+00
6.061540E-01	4.12415E+01	2.5894E+01	9.2146E+03	7.4859E+00	0.000E+00	2.045E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 541

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
6.085908E-01	4.11447E+01	2.5837E+01	9.1576E+03	7.5086E+00	0.000E+00	2.037E+00
6.122460E-01	4.14807E+01	2.6131E+01	9.2066E+03	7.5425E+00	0.000E+00	2.025E+00
6.213840E-01	4.19941E+01	2.5925E+01	8.9996E+03	7.6261E+00	0.000E+00	1.995E+00
6.260625E-01	4.22047E+01	2.5820E+01	8.8962E+03	7.6683E+00	0.000E+00	1.980E+00
6.692609E-01	4.37522E+01	2.4872E+01	8.0165E+03	8.0392E+00	0.000E+00	1.853E+00
7.075600E-01	4.47128E+01	2.4068E+01	7.3374E+03	8.3413E+00	0.000E+00	1.752E+00
7.154399E-01	4.47980E+01	2.3907E+01	7.2081E+03	8.4005E+00	0.000E+00	1.733E+00
7.183900E-01	4.47765E+01	2.3847E+01	7.1605E+03	8.4225E+00	0.000E+00	1.726E+00
7.212780E-01	4.45797E+01	2.3789E+01	7.1144E+03	8.4438E+00	0.000E+00	1.719E+00
7.256100E-01	4.49684E+01	2.4238E+01	7.2054E+03	8.4755E+00	0.000E+00	1.709E+00
7.364400E-01	4.54842E+01	2.4024E+01	7.0369E+03	8.5536E+00	0.000E+00	1.684E+00
7.648052E-01	4.63523E+01	2.3479E+01	6.6222E+03	8.7497E+00	0.000E+00	1.621E+00
8.175768E-01	4.75945E+01	2.2516E+01	5.9407E+03	9.0842E+00	0.000E+00	1.516E+00
8.739896E-01	4.86630E+01	2.1556E+01	5.3201E+03	9.4014E+00	0.000E+00	1.419E+00
9.342948E-01	4.96065E+01	2.0591E+01	4.7539E+03	9.6991E+00	0.000E+00	1.327E+00
9.987612E-01	5.06849E+01	1.9637E+01	4.2412E+03	9.9750E+00	0.000E+00	1.241E+00
1.067676E+00	5.15823E+01	1.8405E+01	3.7184E+03	1.0227E+01	0.000E+00	1.161E+00
1.141345E+00	5.19997E+01	1.7235E+01	3.2574E+03	1.0453E+01	0.000E+00	1.086E+00
1.220098E+00	5.22102E+01	1.6143E+01	2.8543E+03	1.0632E+01	0.000E+00	1.016E+00
1.304285E+00	5.22314E+01	1.5054E+01	2.4896E+03	1.0822E+01	0.000E+00	9.506E-01
1.394281E+00	5.19673E+01	1.3892E+01	2.1493E+03	1.0962E+01	0.000E+00	8.892E-01
1.490486E+00	5.13123E+01	1.2745E+01	1.8444E+03	1.1071E+01	0.000E+00	8.318E-01
1.593329E+00	5.01859E+01	1.1722E+01	1.5869E+03	1.1149E+01	0.000E+00	7.781E-01
1.703269E+00	4.83657E+01	1.0808E+01	1.3688E+03	1.1194E+01	0.000E+00	7.279E-01
1.820795E+00	4.52984E+01	9.9909E+00	1.1836E+03	1.1208E+01	0.000E+00	6.809E-01
1.946430E+00	3.91171E+01	9.2574E+00	1.0259E+03	1.1190E+01	0.000E+00	6.370E-01
2.080733E+00	1.46829E+01	8.5963E+00	8.9117E+02	1.1141E+01	0.000E+00	5.959E-01
2.110992E+00	-1.88242E+01	8.4569E+00	8.6415E+02	1.1126E+01	0.000E+00	5.873E-01
2.119478E+00	-7.12447E+01	8.4187E+00	8.5680E+02	1.1122E+01	0.000E+00	5.850E-01
2.132208E+00	1.04274E+01	1.1086E+02	1.1215E+04	1.1115E+01	0.000E+00	5.815E-01
2.157862E+00	5.18687E+01	6.9501E+01	6.9475E+03	1.1101E+01	0.000E+00	5.746E-01
2.164032E+00	5.32839E+01	6.2390E+01	6.2190E+03	1.1098E+01	0.000E+00	5.729E-01
2.190891E+00	3.80129E+01	3.9963E+01	3.9346E+03	1.1082E+01	0.000E+00	5.659E-01
2.199698E+00	3.74032E+00	3.4875E+01	3.4199E+03	1.1077E+01	0.000E+00	5.636E-01
2.212910E+00	5.77720E+01	9.5443E+01	9.3035E+03	1.1069E+01	0.000E+00	5.603E-01
2.224304E+00	7.30782E+01	7.8178E+01	7.5815E+03	1.1061E+01	0.000E+00	5.574E-01
2.245938E+00	8.17530E+01	5.7096E+01	5.4837E+03	1.1047E+01	0.000E+00	5.520E-01
2.377781E+00	6.59294E+01	2.3582E+01	2.1393E+03	1.0952E+01	0.000E+00	5.214E-01
2.541848E+00	5.83316E+01	2.2986E+01	1.9506E+03	1.0815E+01	0.000E+00	4.878E-01
2.592492E+00	5.70214E+01	2.3507E+01	1.9559E+03	1.0769E+01	0.000E+00	4.782E-01
2.632173E+00	5.50447E+01	2.3949E+01	1.9627E+03	1.0732E+01	0.000E+00	4.710E-01
2.642755E+00	5.27253E+01	2.4066E+01	1.9644E+03	1.0722E+01	0.000E+00	4.691E-01
2.658627E+00	5.51866E+01	2.8877E+01	2.3429E+03	1.0707E+01	0.000E+00	4.663E-01
2.698308E+00	5.76883E+01	2.9180E+01	2.3327E+03	1.0669E+01	0.000E+00	4.595E-01
2.717235E+00	5.84097E+01	2.9305E+01	2.3264E+03	1.0650E+01	0.000E+00	4.563E-01
2.904724E+00	6.35241E+01	2.8370E+01	2.1068E+03	1.0461E+01	0.000E+00	4.268E-01
2.965970E+00	6.43351E+01	2.7469E+01	1.9978E+03	1.0396E+01	0.000E+00	4.180E-01
3.011367E+00	6.42496E+01	2.6800E+01	1.9197E+03	1.0348E+01	0.000E+00	4.117E-01
3.023473E+00	6.35100E+01	2.6630E+01	1.8999E+03	1.0335E+01	0.000E+00	4.101E-01
3.041632E+00	6.46389E+01	2.8139E+01	1.9956E+03	1.0316E+01	0.000E+00	4.076E-01
3.087030E+00	6.59512E+01	2.7483E+01	1.9204E+03	1.0267E+01	0.000E+00	4.016E-01
3.105150E+00	6.62830E+01	2.7228E+01	1.8915E+03	1.0248E+01	0.000E+00	3.993E-01
3.230080E+00	6.76616E+01	2.5595E+01	1.7092E+03	1.0111E+01	0.000E+00	3.838E-01
3.279520E+00	6.76913E+01	2.5008E+01	1.6449E+03	1.0057E+01	0.000E+00	3.781E-01
3.292704E+00	6.72548E+01	2.4856E+01	1.6283E+03	1.0042E+01	0.000E+00	3.765E-01
3.312480E+00	6.79967E+01	2.5730E+01	1.6755E+03	1.0020E+01	0.000E+00	3.743E-01
3.319406E+00	6.81819E+01	2.5651E+01	1.6669E+03	1.0013E+01	0.000E+00	3.735E-01
3.361920E+00	6.89051E+01	2.5178E+01	1.6155E+03	9.9656E+00	0.000E+00	3.688E-01
3.548445E+00	7.06289E+01	2.3279E+01	1.4151E+03	9.7583E+00	0.000E+00	3.494E-01
3.793288E+00	7.19837E+01	2.1170E+01	1.2039E+03	9.4863E+00	0.000E+00	3.269E-01
4.055024E+00	7.29709E+01	1.9274E+01	1.0253E+03	9.1988E+00	0.000E+00	3.058E-01
4.334821E+00	7.39184E+01	1.7512E+01	8.7143E+02	8.8982E+00	0.000E+00	2.860E-01
4.633924E+00	7.45573E+01	1.5801E+01	7.3554E+02	8.5864E+00	0.000E+00	2.676E-01
4.953664E+00	7.48455E+01	1.4266E+01	6.2120E+02	8.2656E+00	0.000E+00	2.503E-01
5.295467E+00	7.51028E+01	1.2901E+01	5.2552E+02	7.9381E+00	0.000E+00	2.341E-01

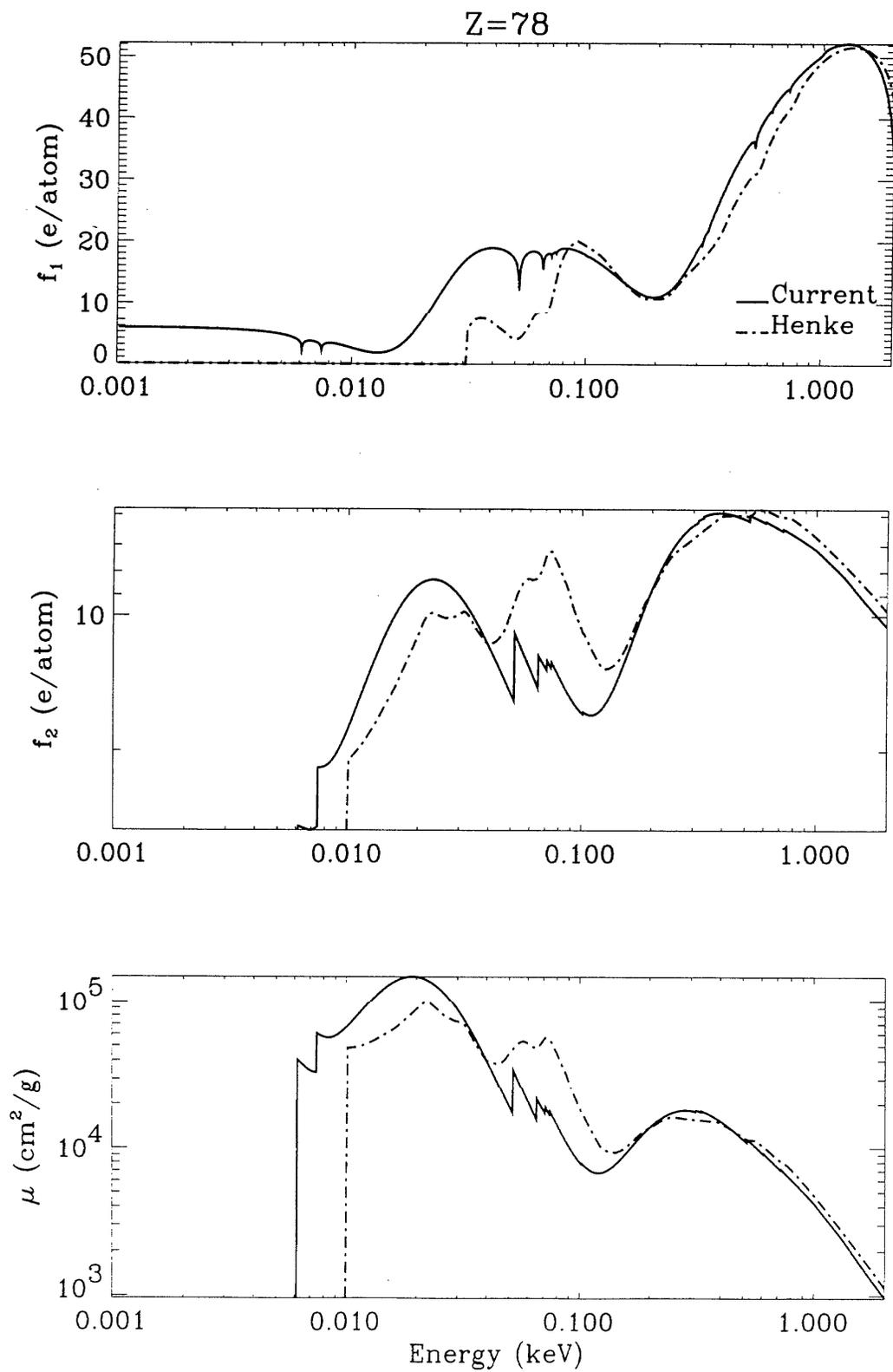
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

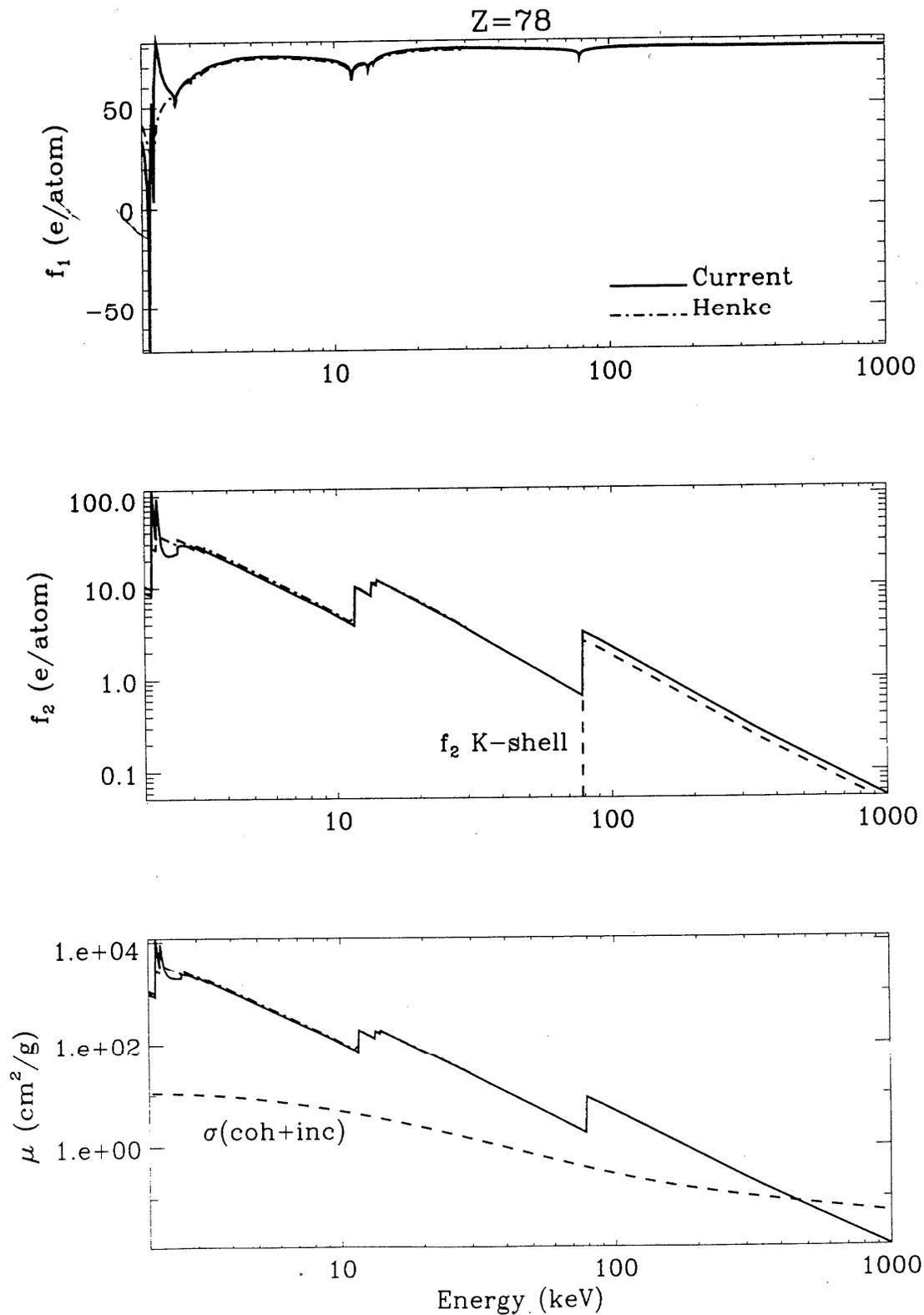
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
5.660855E+00	7.51606E+01	1.1640E+01	4.4353E+02	7.6057E+00	0.000E+00	2.190E-01
6.051453E+00	7.51264E+01	1.0515E+01	3.7481E+02	7.2705E+00	0.000E+00	2.049E-01
6.469004E+00	7.50659E+01	9.4878E+00	3.1637E+02	6.9344E+00	0.000E+00	1.917E-01
6.915365E+00	7.49142E+01	8.5675E+00	2.6724E+02	6.5990E+00	0.000E+00	1.793E-01
7.392525E+00	7.46892E+01	7.7469E+00	2.2605E+02	6.2661E+00	0.000E+00	1.677E-01
7.902609E+00	7.44114E+01	7.0160E+00	1.9151E+02	5.9372E+00	0.000E+00	1.569E-01
8.447890E+00	7.40777E+01	6.3639E+00	1.6250E+02	5.6136E+00	0.000E+00	1.468E-01
9.030794E+00	7.36951E+01	5.7619E+00	1.3763E+02	5.2966E+00	0.000E+00	1.373E-01
9.653919E+00	7.31300E+01	5.1487E+00	1.1504E+02	4.9873E+00	0.000E+00	1.284E-01
1.032004E+01	7.22348E+01	4.5951E+00	9.6047E+01	4.6867E+00	0.000E+00	1.201E-01
1.103212E+01	7.05039E+01	4.1092E+00	8.0347E+01	4.3957E+00	0.000E+00	1.124E-01
1.133243E+01	6.88504E+01	3.9307E+00	7.4820E+01	4.2813E+00	0.000E+00	1.094E-01
1.150588E+01	6.61079E+01	3.8327E+00	7.1853E+01	4.2174E+00	0.000E+00	1.078E-01
1.155214E+01	6.28977E+01	3.8063E+00	7.1074E+01	4.2007E+00	0.000E+00	1.073E-01
1.162152E+01	6.60884E+01	1.0039E+01	1.8634E+02	4.1757E+00	0.000E+00	1.067E-01
1.179334E+01	6.88841E+01	9.7860E+00	1.7899E+02	4.1148E+00	0.000E+00	1.051E-01
1.179497E+01	6.88982E+01	9.7837E+00	1.7892E+02	4.1142E+00	0.000E+00	1.051E-01
1.260708E+01	7.13032E+01	8.7112E+00	1.4905E+02	3.8447E+00	0.000E+00	9.834E-02
1.300715E+01	7.09797E+01	8.2482E+00	1.3679E+02	3.7221E+00	0.000E+00	9.532E-02
1.320624E+01	6.97834E+01	8.0311E+00	1.3118E+02	3.6634E+00	0.000E+00	9.388E-02
1.325933E+01	6.81990E+01	7.9745E+00	1.2973E+02	3.6480E+00	0.000E+00	9.351E-02
1.333896E+01	6.98565E+01	1.1061E+01	1.7888E+02	3.6250E+00	0.000E+00	9.295E-02
1.347697E+01	7.10542E+01	1.0866E+01	1.7391E+02	3.5858E+00	0.000E+00	9.200E-02
1.353805E+01	7.13171E+01	1.0781E+01	1.7178E+02	3.5687E+00	0.000E+00	9.158E-02
1.360230E+01	7.15115E+01	1.0693E+01	1.6957E+02	3.5508E+00	0.000E+00	9.115E-02
1.381050E+01	7.15297E+01	1.0415E+01	1.6267E+02	3.4939E+00	0.000E+00	8.978E-02
1.386602E+01	7.08526E+01	1.0343E+01	1.6090E+02	3.4789E+00	0.000E+00	8.942E-02
1.394930E+01	7.18848E+01	1.1865E+01	1.8348E+02	3.4567E+00	0.000E+00	8.888E-02
1.415750E+01	7.30669E+01	1.1594E+01	1.7665E+02	3.4021E+00	0.000E+00	8.757E-02
1.440688E+01	7.38451E+01	1.1283E+01	1.6893E+02	3.3385E+00	0.000E+00	8.606E-02
1.540095E+01	7.55654E+01	1.0156E+01	1.4224E+02	3.1029E+00	0.000E+00	8.050E-02
1.646362E+01	7.65401E+01	9.1308E+00	1.1963E+02	2.8792E+00	0.000E+00	7.531E-02
1.759961E+01	7.71783E+01	8.2076E+00	1.0060E+02	2.6674E+00	0.000E+00	7.045E-02
1.881398E+01	7.76070E+01	7.3678E+00	8.4474E+01	2.4674E+00	0.000E+00	6.590E-02
2.011215E+01	7.78921E+01	6.6140E+00	7.0936E+01	2.2791E+00	0.000E+00	6.165E-02
2.149988E+01	7.80801E+01	5.9398E+00	5.9594E+01	2.1022E+00	0.000E+00	5.767E-02
2.298338E+01	7.82008E+01	5.3372E+00	5.0091E+01	1.9366E+00	0.000E+00	5.395E-02
2.456923E+01	7.83316E+01	4.7908E+00	4.2061E+01	1.7818E+00	0.000E+00	5.046E-02
2.626450E+01	7.83662E+01	4.3029E+00	3.5340E+01	1.6375E+00	0.000E+00	4.721E-02
2.807676E+01	7.84496E+01	3.8346E+00	2.9461E+01	1.5033E+00	0.000E+00	4.416E-02
3.001405E+01	7.84172E+01	3.4044E+00	2.4467E+01	1.3789E+00	0.000E+00	4.131E-02
3.208502E+01	7.83568E+01	3.0249E+00	2.0337E+01	1.2637E+00	0.000E+00	3.864E-02
3.429889E+01	7.82796E+01	2.6899E+00	1.6917E+01	1.1573E+00	0.000E+00	3.615E-02
3.666551E+01	7.81915E+01	2.3940E+00	1.4084E+01	1.0592E+00	0.000E+00	3.381E-02
3.919543E+01	7.80962E+01	2.1323E+00	1.1735E+01	9.6900E-01	0.000E+00	3.163E-02
4.189992E+01	7.79955E+01	1.9008E+00	9.7858E+00	8.8619E-01	0.000E+00	2.959E-02
4.479101E+01	7.78905E+01	1.6959E+00	8.1670E+00	8.1032E-01	0.000E+00	2.768E-02
4.788159E+01	7.77808E+01	1.5140E+00	6.8207E+00	7.4093E-01	0.000E+00	2.589E-02
5.118542E+01	7.76651E+01	1.3516E+00	5.6960E+00	6.7758E-01	0.000E+00	2.422E-02
5.471721E+01	7.75387E+01	1.2057E+00	4.7532E+00	6.1983E-01	0.000E+00	2.266E-02
5.849270E+01	7.73958E+01	1.0758E+00	3.9674E+00	5.6728E-01	0.000E+00	2.120E-02
6.252870E+01	7.72241E+01	9.5706E-01	3.3016E+00	5.1953E-01	0.000E+00	1.983E-02
6.684318E+01	7.69955E+01	8.5033E-01	2.7441E+00	4.7620E-01	0.000E+00	1.855E-02
7.145536E+01	7.66375E+01	7.5579E-01	2.2816E+00	4.3692E-01	0.000E+00	1.735E-02
7.638578E+01	7.57414E+01	6.7191E-01	1.8974E+00	4.0137E-01	0.000E+00	1.623E-02
7.682690E+01	7.55554E+01	6.6514E-01	1.8675E+00	3.9847E-01	0.000E+00	1.614E-02
7.800282E+01	7.44831E+01	6.4764E-01	1.7910E+00	3.9092E-01	0.000E+00	1.589E-02
7.831640E+01	7.31997E+01	6.4310E-01	1.7713E+00	3.8896E-01	0.000E+00	1.583E-02
7.878677E+01	7.44981E+01	3.1616E+00	8.6561E+00	3.8605E-01	6.914E+00	1.574E-02
7.996269E+01	7.56651E+01	3.0867E+00	8.3267E+00	3.7897E-01	6.654E+00	1.551E-02
8.165640E+01	7.62943E+01	2.9959E+00	7.9141E+00	3.6922E-01	6.339E+00	1.518E-02
8.729069E+01	7.71764E+01	2.7112E+00	6.6997E+00	3.4016E-01	5.399E+00	1.420E-02
9.331374E+01	7.76103E+01	2.4374E+00	5.6344E+00	3.1392E-01	4.559E+00	1.329E-02
9.975239E+01	7.78719E+01	2.1733E+00	4.6996E+00	2.9024E-01	3.810E+00	1.243E-02
1.066353E+02	7.80302E+01	1.9395E+00	3.9234E+00	2.6888E-01	3.187E+00	1.163E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 543

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.139931E+02	7.81365E+01	1.7348E+00	3.2827E+00	2.4960E-01	2.673E+00	1.088E-02
1.218587E+02	7.82074E+01	1.5519E+00	2.7470E+00	2.3221E-01	2.241E+00	1.017E-02
1.302669E+02	7.82536E+01	1.3884E+00	2.2991E+00	2.1651E-01	1.880E+00	9.518E-03
1.392553E+02	7.82822E+01	1.2424E+00	1.9244E+00	2.0234E-01	1.576E+00	8.903E-03
1.488640E+02	7.82982E+01	1.1118E+00	1.6110E+00	1.8952E-01	1.322E+00	8.329E-03
1.591356E+02	7.83315E+01	9.9455E-01	1.3481E+00	1.7793E-01	1.108E+00	7.791E-03
1.701159E+02	7.83300E+01	8.8804E-01	1.1260E+00	1.6742E-01	9.263E-01	7.288E-03
1.818539E+02	7.83228E+01	7.9302E-01	9.4065E-01	1.5787E-01	7.745E-01	6.818E-03
1.944018E+02	7.83119E+01	7.0825E-01	7.8587E-01	1.4919E-01	6.476E-01	6.378E-03
2.078156E+02	7.82983E+01	6.3260E-01	6.5662E-01	1.4126E-01	5.414E-01	5.966E-03
2.221548E+02	7.82831E+01	5.6508E-01	5.4868E-01	1.3402E-01	4.527E-01	5.581E-03
2.374835E+02	7.82669E+01	5.0482E-01	4.5853E-01	1.2737E-01	3.785E-01	5.221E-03
2.538699E+02	7.82503E+01	4.5103E-01	3.8323E-01	1.2126E-01	3.165E-01	4.884E-03
2.713869E+02	7.82334E+01	4.0300E-01	3.2032E-01	1.1561E-01	2.646E-01	4.569E-03
2.901126E+02	7.82167E+01	3.6012E-01	2.6776E-01	1.1038E-01	2.212E-01	4.274E-03
3.101304E+02	7.82003E+01	3.2183E-01	2.2384E-01	1.0551E-01	1.850E-01	3.998E-03
3.315294E+02	7.81841E+01	2.8763E-01	1.8715E-01	1.0096E-01	1.547E-01	3.740E-03
3.544049E+02	7.81683E+01	2.5855E-01	1.5737E-01	9.6697E-02	1.302E-01	3.498E-03
3.788588E+02	7.81543E+01	2.3320E-01	1.3277E-01	9.2687E-02	1.101E-01	3.273E-03
4.050001E+02	7.81417E+01	2.1035E-01	1.1203E-01	8.8901E-02	9.302E-02	3.061E-03
4.329451E+02	7.81300E+01	1.8975E-01	9.4541E-02	8.5313E-02	7.862E-02	2.864E-03





Au Z = 79

Atomic weight = 1.969665E+02 g/mol, nominal density ρ (g/cm³) = 1.8850E+01 μ_a (barns/atom) = μ (cm²/g) \times 3.27071E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.13642E+05

21 edges. Edge energies (keV):

K		8.07249E+00	L	I	1.43528E+00	L	II	1.37336E+00	L	III	1.19187E+01
M	I	3.42490E+00	M	II	3.14780E+00	M	III	2.74300E+00	M	IV	2.29110E+00
M	V	2.20570E+00	N	I	7.58800E-00	N	II	6.43700E-00	N	III	5.45400E-01
N	IV	3.52000E-00	N	V	3.33900E-00	O	I	8.64000E-02	N	VI	8.28000E-02
N	VII	1.07800E-00	O	II	7.17000E-02	O	III	5.37000E-02	O	IV	8.30838E-03
O	V	6.79032E-03									

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.7226E+00, -1.0134E+00 e/atomNuclear Thomson correction f_{NT} = -1.7382E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
6.654510E-03	2.88762E+00	0.0000E+00	0.0000E+00	2.6831E-05	0.000E+00	1.863E+02
6.756365E-03	2.24634E+00	0.0000E+00	0.0000E+00	2.9003E-05	0.000E+00	1.835E+02
6.783526E-03	1.53627E+00	0.0000E+00	0.0000E+00	2.9604E-05	0.000E+00	1.828E+02
6.824268E-03	2.22782E+00	1.3641E+00	4.2705E+04	3.0524E-05	0.000E+00	1.817E+02
6.926123E-03	2.79003E+00	1.3448E+00	4.1481E+04	3.2916E-05	0.000E+00	1.790E+02
8.142217E-03	2.53588E+00	1.2374E+00	3.2469E+04	7.3788E-05	0.000E+00	1.523E+02
8.266843E-03	2.06540E+00	1.2519E+00	3.2352E+04	7.9474E-05	0.000E+00	1.500E+02
8.300076E-03	1.54542E+00	1.2564E+00	3.2341E+04	8.1043E-05	0.000E+00	1.494E+02
8.349926E-03	2.05749E+00	2.2605E+00	5.7837E+04	8.3441E-05	0.000E+00	1.485E+02
8.474552E-03	2.46605E+00	2.2498E+00	5.6718E+04	8.9667E-05	0.000E+00	1.463E+02
1.069000E-02	1.80913E+00	2.9953E+00	5.9861E+04	2.6797E-04	0.000E+00	1.160E+02
1.142761E-02	1.37655E+00	3.6048E+00	6.7392E+04	3.6283E-04	0.000E+00	1.085E+02
1.221612E-02	9.65328E-01	4.4060E+00	7.7054E+04	4.8880E-04	0.000E+00	1.015E+02
1.305903E-02	6.24303E-01	5.4098E+00	8.8504E+04	6.5520E-04	0.000E+00	9.494E+01
1.396010E-02	4.11793E-01	6.6185E+00	1.0129E+05	8.7386E-04	0.000E+00	8.881E+01
1.492335E-02	3.94079E-01	8.0179E+00	1.1478E+05	1.1597E-03	0.000E+00	8.308E+01
1.595306E-02	6.39962E-01	9.5717E+00	1.2818E+05	1.5315E-03	0.000E+00	7.772E+01
1.705382E-02	1.21194E+00	1.1217E+01	1.4053E+05	2.0125E-03	0.000E+00	7.270E+01
1.823053E-02	2.15504E+00	1.2867E+01	1.5079E+05	2.6317E-03	0.000E+00	6.801E+01
1.948844E-02	3.48533E+00	1.4413E+01	1.5801E+05	3.4248E-03	0.000E+00	6.362E+01
2.083314E-02	5.25490E+00	1.5740E+01	1.6141E+05	4.4354E-03	0.000E+00	5.951E+01
2.227063E-02	7.25321E+00	1.6739E+01	1.6058E+05	5.7168E-03	0.000E+00	5.567E+01
2.380730E-02	9.45427E+00	1.7327E+01	1.5549E+05	7.3332E-03	0.000E+00	5.208E+01
2.545001E-02	1.17727E+01	1.7457E+01	1.4655E+05	9.3622E-03	0.000E+00	4.872E+01
2.720606E-02	1.39985E+01	1.7130E+01	1.3452E+05	1.1896E-02	0.000E+00	4.557E+01
2.908327E-02	1.60474E+01	1.6382E+01	1.2034E+05	1.5046E-02	0.000E+00	4.263E+01
3.109002E-02	1.78149E+01	1.5290E+01	1.0507E+05	1.8941E-02	0.000E+00	3.988E+01
3.323523E-02	1.92362E+01	1.3958E+01	8.9725E+04	2.3734E-02	0.000E+00	3.731E+01
3.52846E-02	2.02840E+01	1.2491E+01	7.5109E+04	2.9605E-02	0.000E+00	3.490E+01
3.797993E-02	2.09586E+01	1.0985E+01	6.1791E+04	3.6758E-02	0.000E+00	3.264E+01
4.060054E-02	2.12841E+01	9.5736E+00	5.0114E+04	4.5434E-02	0.000E+00	3.054E+01
4.340198E-02	2.12906E+01	8.1647E+00	4.0190E+04	5.5905E-02	0.000E+00	2.857E+01
4.639671E-02	2.09863E+01	6.9419E+00	3.1965E+04	6.8482E-02	0.000E+00	2.672E+01
4.959809E-02	2.02798E+01	5.8697E+00	2.5284E+04	8.3515E-02	0.000E+00	2.500E+01
5.262600E-02	1.86073E+01	5.0440E+00	2.0477E+04	9.9244E-02	0.000E+00	2.356E+01
5.302035E-02	1.80425E+01	4.9482E+00	1.9938E+04	1.0140E-01	0.000E+00	2.338E+01
5.343150E-02	1.68898E+01	4.8509E+00	1.9396E+04	1.0367E-01	0.000E+00	2.320E+01
5.364630E-02	1.48645E+01	4.8011E+00	1.9120E+04	1.0487E-01	0.000E+00	2.311E+01
5.396850E-02	1.69775E+01	8.6930E+00	3.4412E+04	1.0668E-01	0.000E+00	2.297E+01
5.477400E-02	1.87833E+01	8.3716E+00	3.2653E+04	1.1129E-01	0.000E+00	2.264E+01
5.667876E-02	2.00123E+01	7.6750E+00	2.8930E+04	1.2257E-01	0.000E+00	2.187E+01
6.058959E-02	2.06579E+01	6.4803E+00	2.2850E+04	1.4753E-01	0.000E+00	2.046E+01
6.477028E-02	2.05746E+01	5.4680E+00	1.8036E+04	1.7679E-01	0.000E+00	1.914E+01
6.923942E-02	1.98937E+01	4.6215E+00	1.4260E+04	2.1095E-01	0.000E+00	1.791E+01
7.026600E-02	1.95410E+01	4.4554E+00	1.3546E+04	2.1920E-01	0.000E+00	1.764E+01
7.134150E-02	1.86908E+01	4.2912E+00	1.2851E+04	2.2801E-01	0.000E+00	1.738E+01
7.162830E-02	1.77435E+01	4.2490E+00	1.2673E+04	2.3039E-01	0.000E+00	1.731E+01
7.205850E-02	1.86642E+01	6.0093E+00	1.7817E+04	2.3398E-01	0.000E+00	1.721E+01
7.313400E-02	1.94156E+01	5.8445E+00	1.7073E+04	2.4306E-01	0.000E+00	1.695E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 547

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
7.401695E-02	1.96412E+01	5.7157E+00	1.6498E+04	2.5063E-01	0.000E+00	1.675E+01
7.912411E-02	1.98939E+01	5.0728E+00	1.3697E+04	2.9652E-01	0.000E+00	1.567E+01
8.114400E-02	1.97664E+01	4.8498E+00	1.2769E+04	3.1562E-01	0.000E+00	1.528E+01
8.238600E-02	1.94939E+01	4.7156E+00	1.2228E+04	3.2762E-01	0.000E+00	1.505E+01
8.271720E-02	1.91793E+01	4.6802E+00	1.2088E+04	3.3086E-01	0.000E+00	1.499E+01
8.321400E-02	1.94857E+01	5.2303E+00	1.3428E+04	3.3573E-01	0.000E+00	1.490E+01
8.445600E-02	1.97029E+01	5.0814E+00	1.2854E+04	3.4806E-01	0.000E+00	1.468E+01
8.458368E-02	1.97089E+01	5.0663E+00	1.2797E+04	3.4934E-01	0.000E+00	1.466E+01
8.467200E-02	1.97120E+01	5.0559E+00	1.2757E+04	3.5022E-01	0.000E+00	1.464E+01
8.596800E-02	1.96317E+01	4.9054E+00	1.2191E+04	3.6332E-01	0.000E+00	1.442E+01
8.631360E-02	1.94433E+01	4.8660E+00	1.2044E+04	3.6685E-01	0.000E+00	1.436E+01
8.683200E-02	1.96712E+01	5.2064E+00	1.2810E+04	3.7216E-01	0.000E+00	1.428E+01
8.812800E-02	1.98761E+01	5.0542E+00	1.2253E+04	3.8560E-01	0.000E+00	1.407E+01
9.041995E-02	1.99742E+01	4.7971E+00	1.1335E+04	4.0984E-01	0.000E+00	1.371E+01
9.665893E-02	1.98306E+01	4.2015E+00	9.2864E+03	4.7882E-01	0.000E+00	1.283E+01
1.033284E-01	1.94054E+01	3.7598E+00	7.7738E+03	5.5712E-01	0.000E+00	1.200E+01
1.056440E-01	1.92152E+01	3.6471E+00	7.3755E+03	5.8532E-01	0.000E+00	1.174E+01
1.072610E-01	1.90492E+01	3.5794E+00	7.1294E+03	6.0532E-01	0.000E+00	1.156E+01
1.076922E-01	1.89666E+01	3.5628E+00	7.0680E+03	6.1069E-01	0.000E+00	1.151E+01
1.083390E-01	1.89635E+01	3.6344E+00	7.1669E+03	6.1878E-01	0.000E+00	1.144E+01
1.099560E-01	1.88743E+01	3.5821E+00	6.9598E+03	6.3918E-01	0.000E+00	1.128E+01
1.104581E-01	1.88392E+01	3.5674E+00	6.9000E+03	6.4555E-01	0.000E+00	1.122E+01
1.180797E-01	1.82190E+01	3.4351E+00	6.2151E+03	7.4499E-01	0.000E+00	1.050E+01
1.262272E-01	1.74805E+01	3.4634E+00	5.8618E+03	8.5628E-01	0.000E+00	9.822E+00
1.349368E-01	1.66550E+01	3.6848E+00	5.8341E+03	9.8026E-01	0.000E+00	9.188E+00
1.442475E-01	1.57662E+01	4.1139E+00	6.0930E+03	1.1177E+00	0.000E+00	8.595E+00
1.542005E-01	1.48392E+01	4.7809E+00	6.6238E+03	1.2694E+00	0.000E+00	8.040E+00
1.648404E-01	1.39200E+01	5.7275E+00	7.4232E+03	1.4361E+00	0.000E+00	7.521E+00
1.762144E-01	1.30583E+01	6.9748E+00	8.4563E+03	1.6183E+00	0.000E+00	7.036E+00
1.883732E-01	1.23320E+01	8.5341E+00	9.6789E+03	1.8166E+00	0.000E+00	6.582E+00
2.013709E-01	1.18252E+01	1.0395E+01	1.1029E+04	2.0313E+00	0.000E+00	6.157E+00
2.152655E-01	1.16285E+01	1.2519E+01	1.2425E+04	2.2628E+00	0.000E+00	5.760E+00
2.301188E-01	1.18101E+01	1.4836E+01	1.3774E+04	2.5112E+00	0.000E+00	5.388E+00
2.459970E-01	1.24275E+01	1.7247E+01	1.4979E+04	2.7765E+00	0.000E+00	5.040E+00
2.629708E-01	1.35101E+01	1.9637E+01	1.5954E+04	3.0583E+00	0.000E+00	4.715E+00
2.811158E-01	1.50151E+01	2.1884E+01	1.6631E+04	3.3564E+00	0.000E+00	4.410E+00
3.005128E-01	1.68766E+01	2.3873E+01	1.6972E+04	3.6700E+00	0.000E+00	4.126E+00
3.212482E-01	1.89208E+01	2.5508E+01	1.6964E+04	3.9983E+00	0.000E+00	3.859E+00
3.272220E-01	1.94424E+01	2.5888E+01	1.6902E+04	4.0915E+00	0.000E+00	3.789E+00
3.322305E-01	1.97143E+01	2.6177E+01	1.6833E+04	4.1690E+00	0.000E+00	3.732E+00
3.335661E-01	1.95627E+01	2.6249E+01	1.6812E+04	4.1896E+00	0.000E+00	3.717E+00
3.355695E-01	2.00379E+01	2.6917E+01	1.7137E+04	4.2204E+00	0.000E+00	3.695E+00
3.405780E-01	2.07741E+01	2.7197E+01	1.7061E+04	4.2972E+00	0.000E+00	3.640E+00
3.434143E-01	2.11074E+01	2.7345E+01	1.7011E+04	4.3404E+00	0.000E+00	3.610E+00
3.449600E-01	2.12760E+01	2.7421E+01	1.6983E+04	4.3639E+00	0.000E+00	3.594E+00
3.502400E-01	2.17325E+01	2.7665E+01	1.6876E+04	4.4437E+00	0.000E+00	3.540E+00
3.516480E-01	2.16840E+01	2.7726E+01	1.6845E+04	4.4649E+00	0.000E+00	3.526E+00
3.537600E-01	2.21370E+01	2.8234E+01	1.7051E+04	4.4966E+00	0.000E+00	3.505E+00
3.590400E-01	2.29277E+01	2.8458E+01	1.6934E+04	4.5755E+00	0.000E+00	3.453E+00
3.671099E-01	2.39458E+01	2.8755E+01	1.6734E+04	4.6949E+00	0.000E+00	3.377E+00
3.924405E-01	2.68316E+01	2.9359E+01	1.5983E+04	5.0603E+00	0.000E+00	3.159E+00
4.195189E-01	2.95822E+01	2.9557E+01	1.5052E+04	5.4351E+00	0.000E+00	2.955E+00
4.484657E-01	3.21468E+01	2.9402E+01	1.4006E+04	5.8173E+00	0.000E+00	2.765E+00
4.794098E-01	3.44526E+01	2.8958E+01	1.2905E+04	6.2049E+00	0.000E+00	2.586E+00
5.124891E-01	3.63689E+01	2.8289E+01	1.1793E+04	6.5956E+00	0.000E+00	2.419E+00
5.344920E-01	3.70910E+01	2.7778E+01	1.1103E+04	6.8423E+00	0.000E+00	2.320E+00
5.426730E-01	3.67881E+01	2.7580E+01	1.0858E+04	6.9314E+00	0.000E+00	2.285E+00
5.448546E-01	3.60273E+01	2.7527E+01	1.0793E+04	6.9550E+00	0.000E+00	2.276E+00
5.478508E-01	3.70041E+01	2.9167E+01	1.1374E+04	6.9871E+00	0.000E+00	2.263E+00
5.481270E-01	3.70768E+01	2.9161E+01	1.1366E+04	6.9901E+00	0.000E+00	2.262E+00
5.563080E-01	3.82543E+01	2.8965E+01	1.1123E+04	7.0769E+00	0.000E+00	2.229E+00
5.856525E-01	4.03462E+01	2.8246E+01	1.0304E+04	7.3770E+00	0.000E+00	2.117E+00
6.260625E-01	4.22591E+01	2.7245E+01	9.2972E+03	7.7626E+00	0.000E+00	1.980E+00
6.308260E-01	4.24297E+01	2.7127E+01	9.1872E+03	7.8060E+00	0.000E+00	1.965E+00
6.404815E-01	4.26667E+01	2.6890E+01	8.9695E+03	7.8927E+00	0.000E+00	1.936E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.430563E-01	4.25748E+01	2.6827E+01	8.9126E+03	7.9156E+00	0.000E+00	1.928E+00
6.469185E-01	4.29232E+01	2.7116E+01	8.9549E+03	7.9496E+00	0.000E+00	1.917E+00
6.565740E-01	4.34632E+01	2.6886E+01	8.7485E+03	8.0335E+00	0.000E+00	1.888E+00
6.692609E-01	4.40085E+01	2.6587E+01	8.4872E+03	8.1413E+00	0.000E+00	1.853E+00
7.154399E-01	4.55715E+01	2.5529E+01	7.6234E+03	8.5105E+00	0.000E+00	1.733E+00
7.436240E-01	4.62542E+01	2.4910E+01	7.1565E+03	8.7190E+00	0.000E+00	1.667E+00
7.550060E-01	4.63380E+01	2.4666E+01	6.9795E+03	8.7997E+00	0.000E+00	1.642E+00
7.580412E-01	4.61462E+01	2.4601E+01	6.9334E+03	8.8209E+00	0.000E+00	1.636E+00
7.625940E-01	4.65430E+01	2.5041E+01	7.0154E+03	8.8524E+00	0.000E+00	1.626E+00
7.648052E-01	4.66801E+01	2.4995E+01	6.9823E+03	8.8676E+00	0.000E+00	1.621E+00
7.739760E-01	4.70777E+01	2.4806E+01	6.8472E+03	8.9299E+00	0.000E+00	1.602E+00
8.175768E-01	4.83521E+01	2.3937E+01	6.2550E+03	9.2099E+00	0.000E+00	1.516E+00
8.739896E-01	4.96262E+01	2.2887E+01	5.5945E+03	9.5348E+00	0.000E+00	1.419E+00
9.342948E-01	5.07715E+01	2.1848E+01	4.9959E+03	9.8401E+00	0.000E+00	1.327E+00
9.987612E-01	5.18869E+01	2.0821E+01	4.4537E+03	1.0123E+01	0.000E+00	1.241E+00
1.067676E+00	5.26329E+01	1.9479E+01	3.8978E+03	1.0382E+01	0.000E+00	1.161E+00
1.141345E+00	5.31084E+01	1.8210E+01	3.4087E+03	1.0615E+01	0.000E+00	1.086E+00
1.220098E+00	5.33870E+01	1.7025E+01	2.9811E+03	1.0820E+01	0.000E+00	1.016E+00
1.304285E+00	5.34880E+01	1.5925E+01	2.6085E+03	1.0996E+01	0.000E+00	9.506E-01
1.394281E+00	5.33947E+01	1.4830E+01	2.2724E+03	1.1141E+01	0.000E+00	8.892E-01
1.490486E+00	5.30061E+01	1.3730E+01	1.9681E+03	1.1255E+01	0.000E+00	8.318E-01
1.593329E+00	5.22444E+01	1.2694E+01	1.7020E+03	1.1337E+01	0.000E+00	7.781E-01
1.703269E+00	5.09668E+01	1.1680E+01	1.4650E+03	1.1386E+01	0.000E+00	7.279E-01
1.820795E+00	4.88362E+01	1.0762E+01	1.2628E+03	1.1402E+01	0.000E+00	6.809E-01
1.946430E+00	4.50301E+01	9.9424E+00	1.0913E+03	1.1386E+01	0.000E+00	6.370E-01
2.080733E+00	3.60919E+01	9.2074E+00	9.4538E+02	1.1339E+01	0.000E+00	5.959E-01
2.161586E+00	1.87393E+01	8.8214E+00	8.7187E+02	1.1297E+01	0.000E+00	5.736E-01
2.194671E+00	-1.30669E+01	8.6717E+00	8.4415E+02	1.1278E+01	0.000E+00	5.649E-01
2.203494E+00	-6.12130E+01	8.6318E+00	8.3691E+02	1.1273E+01	0.000E+00	5.627E-01
2.216728E+00	1.28463E+01	1.0285E+02	9.9127E+03	1.1265E+01	0.000E+00	5.593E-01
2.224304E+00	3.27742E+01	9.0444E+01	8.6870E+03	1.1260E+01	0.000E+00	5.574E-01
2.245278E+00	5.19600E+01	6.4061E+01	6.0955E+03	1.1246E+01	0.000E+00	5.522E-01
2.249814E+00	5.28533E+01	5.9600E+01	5.6596E+03	1.1243E+01	0.000E+00	5.511E-01
2.279645E+00	3.81906E+01	3.8025E+01	3.5636E+03	1.1223E+01	0.000E+00	5.439E-01
2.288809E+00	5.73360E+00	3.3454E+01	3.1227E+03	1.1217E+01	0.000E+00	5.417E-01
2.302556E+00	5.48213E+01	9.1244E+01	8.4660E+03	1.1207E+01	0.000E+00	5.385E-01
2.336922E+00	8.00961E+01	5.5917E+01	5.1120E+03	1.1182E+01	0.000E+00	5.305E-01
2.377781E+00	7.85725E+01	3.5565E+01	3.1955E+03	1.1151E+01	0.000E+00	5.214E-01
2.541848E+00	6.22389E+01	2.3047E+01	1.9371E+03	1.1013E+01	0.000E+00	4.878E-01
2.688140E+00	5.82047E+01	2.3895E+01	1.8991E+03	1.0876E+01	0.000E+00	4.612E-01
2.717235E+00	5.71776E+01	2.4165E+01	1.9000E+03	1.0847E+01	0.000E+00	4.563E-01
2.729285E+00	5.63349E+01	2.4275E+01	1.9002E+03	1.0835E+01	0.000E+00	4.543E-01
2.740257E+00	5.41109E+01	2.4373E+01	1.9002E+03	1.0824E+01	0.000E+00	4.525E-01
2.756715E+00	5.64571E+01	2.8977E+01	2.2457E+03	1.0808E+01	0.000E+00	4.498E-01
2.797860E+00	5.88235E+01	2.9274E+01	2.2354E+03	1.0766E+01	0.000E+00	4.431E-01
2.904724E+00	6.23644E+01	2.9487E+01	2.1688E+03	1.0656E+01	0.000E+00	4.268E-01
3.084844E+00	6.56231E+01	2.7174E+01	1.8820E+03	1.0462E+01	0.000E+00	4.019E-01
3.105150E+00	6.57043E+01	2.6892E+01	1.8502E+03	1.0440E+01	0.000E+00	3.993E-01
3.132061E+00	6.55180E+01	2.6524E+01	1.8093E+03	1.0410E+01	0.000E+00	3.959E-01
3.144652E+00	6.47895E+01	2.6355E+01	1.7905E+03	1.0396E+01	0.000E+00	3.943E-01
3.163539E+00	6.58906E+01	2.7835E+01	1.8798E+03	1.0376E+01	0.000E+00	3.919E-01
3.210756E+00	6.71633E+01	2.7191E+01	1.8093E+03	1.0323E+01	0.000E+00	3.862E-01
3.319406E+00	6.85273E+01	2.5807E+01	1.6610E+03	1.0202E+01	0.000E+00	3.735E-01
3.356402E+00	6.87847E+01	2.5375E+01	1.6151E+03	1.0161E+01	0.000E+00	3.694E-01
3.407776E+00	6.88081E+01	2.4797E+01	1.5546E+03	1.0103E+01	0.000E+00	3.638E-01
3.421475E+00	6.83757E+01	2.4647E+01	1.5390E+03	1.0087E+01	0.000E+00	3.624E-01
3.442025E+00	6.91048E+01	2.5511E+01	1.5834E+03	1.0064E+01	0.000E+00	3.602E-01
3.493398E+00	5.99971E+01	2.4970E+01	1.5271E+03	1.0006E+01	0.000E+00	3.549E-01
3.548445E+00	7.05989E+01	2.4416E+01	1.4700E+03	9.9440E+00	0.000E+00	3.494E-01
3.793288E+00	7.23254E+01	2.2181E+01	1.2493E+03	9.6680E+00	0.000E+00	3.269E-01
4.055024E+00	7.34745E+01	2.0191E+01	1.0638E+03	9.3761E+00	0.000E+00	3.058E-01
4.334821E+00	7.43307E+01	1.8378E+01	9.0577E+02	9.0705E+00	0.000E+00	2.860E-01
4.633924E+00	7.53000E+01	1.5646E+01	7.6745E+02	8.7535E+00	0.000E+00	2.676E-01
4.953664E+00	7.56887E+01	1.5017E+01	6.4767E+02	8.4272E+00	0.000E+00	2.503E-01
5.295467E+00	7.59056E+01	1.3571E+01	5.4752E+02	8.0938E+00	0.000E+00	2.341E-01

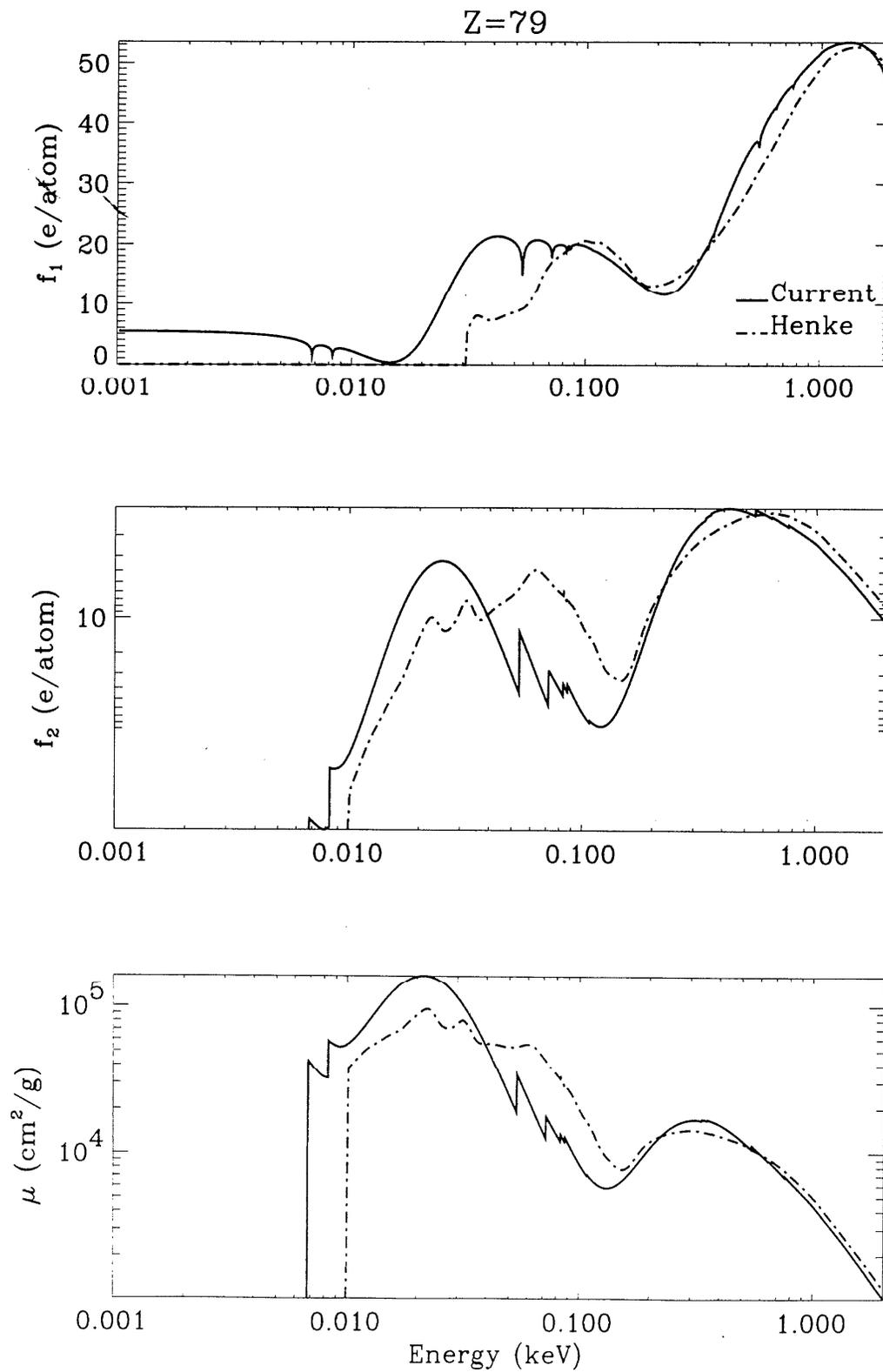
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 549

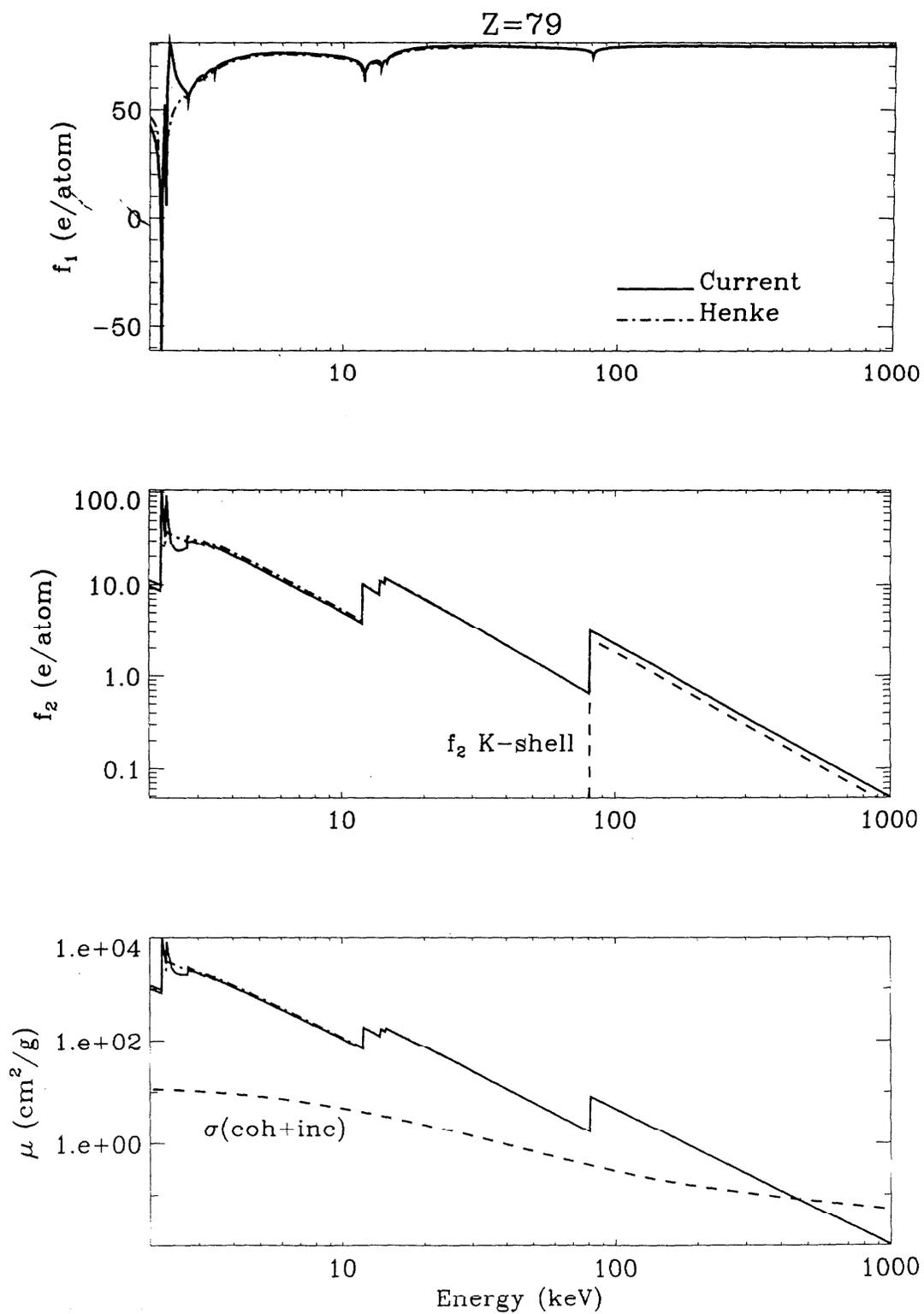
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
5.660855E+00	7.61153E+01	1.2263E+01	4.6282E+02	7.7554E+00	0.000E+00	2.190E-01
6.051453E+00	7.61238E+01	1.1077E+01	3.9108E+02	7.4140E+00	0.000E+00	2.049E-01
6.469004E+00	7.61007E+01	1.0011E+01	3.3063E+02	7.0716E+00	0.000E+00	1.917E-01
6.915365E+00	7.59864E+01	9.0427E+00	2.7936E+02	6.7299E+00	0.000E+00	1.793E-01
7.392523E+00	7.57960E+01	8.1733E+00	2.3621E+02	6.3905E+00	0.000E+00	1.677E-01
7.902609E+00	7.55519E+01	7.3994E+00	2.0004E+02	6.0552E+00	0.000E+00	1.569E-01
8.447890E+00	7.52575E+01	6.7094E+00	1.6968E+02	5.7253E+00	0.000E+00	1.468E-01
9.030794E+00	7.49382E+01	6.0726E+00	1.4366E+02	5.4020E+00	0.000E+00	1.373E-01
9.653919E+00	7.44523E+01	5.4359E+00	1.2030E+02	5.0866E+00	0.000E+00	1.284E-01
1.032004E+01	7.3729E+01	4.8556E+00	1.0052E+02	4.7799E+00	0.000E+00	1.201E-01
1.103212E+01	7.25078E+01	4.3394E+00	8.4034E+01	4.4830E+00	0.000E+00	1.124E-01
1.168033E+01	6.98967E+01	3.9480E+00	7.2211E+01	4.2371E+00	0.000E+00	1.061E-01
1.179334E+01	6.86327E+01	3.8861E+00	7.0399E+01	4.1964E+00	0.000E+00	1.051E-01
1.185911E+01	6.71655E+01	3.8509E+00	6.9374E+01	4.1730E+00	0.000E+00	1.045E-01
1.190678E+01	6.39647E+01	3.8253E+00	6.8636E+01	4.1562E+00	0.000E+00	1.041E-01
1.197829E+01	6.71528E+01	1.0042E+01	1.7911E+02	4.1312E+00	0.000E+00	1.035E-01
1.215707E+01	6.99622E+01	9.7808E+00	1.7188E+02	4.0696E+00	0.000E+00	1.020E-01
1.260708E+01	7.18985E+01	9.1691E+00	1.5538E+02	3.9208E+00	0.000E+00	9.834E-02
1.345893E+01	7.20537E+01	8.1755E+00	1.2977E+02	3.6619E+00	0.000E+00	9.212E-02
1.347697E+01	7.20042E+01	8.1564E+00	1.2930E+02	3.6567E+00	0.000E+00	9.200E-02
1.366493E+01	7.08490E+01	7.9615E+00	1.2447E+02	3.6033E+00	0.000E+00	9.073E-02
1.371987E+01	6.92676E+01	7.9054E+00	1.2310E+02	3.5879E+00	0.000E+00	9.037E-02
1.380227E+01	7.09132E+01	1.0981E+01	1.6997E+02	3.5651E+00	0.000E+00	8.983E-02
1.400827E+01	7.23549E+01	1.0704E+01	1.6325E+02	3.5089E+00	0.000E+00	8.851E-02
1.406574E+01	7.25220E+01	1.0629E+01	1.6145E+02	3.4935E+00	0.000E+00	8.815E-02
1.428104E+01	7.25469E+01	1.0355E+01	1.5491E+02	3.4368E+00	0.000E+00	8.682E-02
1.433845E+01	7.18746E+01	1.0284E+01	1.5323E+02	3.4219E+00	0.000E+00	8.647E-02
1.440688E+01	7.27129E+01	1.1821E+01	1.7529E+02	3.4043E+00	0.000E+00	8.606E-02
1.442456E+01	7.29020E+01	1.1798E+01	1.7474E+02	3.3997E+00	0.000E+00	8.595E-02
1.463986E+01	7.40777E+01	1.1530E+01	1.6827E+02	3.3454E+00	0.000E+00	8.469E-02
1.540095E+01	7.58488E+01	1.0657E+01	1.4784E+02	3.1638E+00	0.000E+00	8.050E-02
1.646362E+01	7.70993E+01	9.5849E+00	1.2438E+02	2.9355E+00	0.000E+00	7.531E-02
1.759961E+01	7.78742E+01	8.6190E+00	1.0463E+02	2.7193E+00	0.000E+00	7.045E-02
1.881398E+01	7.83937E+01	7.7427E+00	8.7922E+01	2.5152E+00	0.000E+00	6.590E-02
2.011215E+01	7.87403E+01	6.9510E+00	7.3837E+01	2.3230E+00	0.000E+00	6.165E-02
2.149988E+01	7.89707E+01	6.2427E+00	6.2033E+01	2.1424E+00	0.000E+00	5.767E-02
2.298338E+01	7.91216E+01	5.6095E+00	5.2143E+01	1.9734E+00	0.000E+00	5.395E-02
2.456923E+01	7.92758E+01	5.0398E+00	4.3824E+01	1.8154E+00	0.000E+00	5.046E-02
2.626450E+01	7.93291E+01	4.5271E+00	3.6825E+01	1.6681E+00	0.000E+00	4.721E-02
2.807676E+01	7.94002E+01	4.0394E+00	3.0736E+01	1.5312E+00	0.000E+00	4.416E-02
3.001405E+01	7.94096E+01	3.5892E+00	2.5548E+01	1.4042E+00	0.000E+00	4.131E-02
3.208502E+01	7.93581E+01	3.1891E+00	2.1235E+01	1.2866E+00	0.000E+00	3.864E-02
3.429889E+01	7.92868E+01	2.8358E+00	1.7664E+01	1.1780E+00	0.000E+00	3.615E-02
3.666551E+01	7.92030E+01	2.5237E+00	1.4705E+01	1.0779E+00	0.000E+00	3.381E-02
3.919543E+01	7.91108E+01	2.2477E+00	1.2252E+01	9.8588E-01	0.000E+00	3.163E-02
4.189992E+01	7.90127E+01	2.0036E+00	1.0216E+01	9.0139E-01	0.000E+00	2.959E-02
4.479101E+01	7.89100E+01	1.7874E+00	8.5253E+00	8.2398E-01	0.000E+00	2.768E-02
4.788159E+01	7.88030E+01	1.5957E+00	7.1200E+00	7.5319E-01	0.000E+00	2.589E-02
5.118542E+01	7.86909E+01	1.4256E+00	5.9502E+00	6.8857E-01	0.000E+00	2.422E-02
5.471721E+01	7.85707E+01	1.2719E+00	4.9660E+00	6.2967E-01	0.000E+00	2.266E-02
5.849270E+01	7.84367E+01	1.1355E+00	4.1473E+00	5.7608E-01	0.000E+00	2.120E-02
6.252870E+01	7.82813E+01	1.0126E+00	3.4596E+00	5.2739E-01	0.000E+00	1.983E-02
6.684318E+01	7.80842E+01	8.9999E-01	2.8765E+00	4.8321E-01	0.000E+00	1.855E-02
7.145536E+01	7.78014E+01	8.0018E-01	2.3924E+00	4.4317E-01	0.000E+00	1.735E-02
7.638578E+01	7.72704E+01	7.1163E-01	1.9904E+00	4.0693E-01	0.000E+00	1.623E-02
7.911040E+01	7.65488E+01	6.6924E-01	1.8073E+00	3.8931E-01	0.000E+00	1.567E-02
8.032127E+01	7.54855E+01	6.5138E-01	1.7326E+00	3.8195E-01	0.000E+00	1.544E-02
8.064417E+01	7.42123E+01	6.4651E-01	1.7127E+00	3.8004E-01	0.000E+00	1.537E-02
8.112852E+01	7.55407E+01	3.1459E+00	8.2842E+00	3.7720E-01	6.601E+00	1.528E-02
8.165640E+01	7.62370E+01	3.1142E+00	8.1479E+00	3.7416E-01	6.495E+00	1.518E-02
8.233940E+01	7.67032E+01	3.0740E+00	7.9759E+00	3.7030E-01	6.362E+00	1.506E-02
8.729069E+01	7.79164E+01	2.8038E+00	6.8623E+00	3.4456E-01	5.497E+00	1.420E-02
9.331374E+01	7.84584E+01	2.5207E+00	5.7711E+00	3.1783E-01	4.642E+00	1.329E-02
9.975239E+01	7.87653E+01	2.2620E+00	4.8446E+00	2.9371E-01	3.911E+00	1.243E-02
1.066353E+02	7.89609E+01	2.0288E+00	4.0647E+00	2.7196E-01	3.292E+00	1.163E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.139931E+02	7.90922E+01	1.8193E+00	3.4096E+00	2.5234E-01	2.769E+00	1.088E-02
1.218587E+02	7.91810E+01	1.6277E+00	2.8537E+00	2.3464E-01	2.323E+00	1.017E-02
1.302669E+02	7.92389E+01	1.4560E+00	2.3879E+00	2.1867E-01	1.947E+00	9.518E-03
1.392553E+02	7.92755E+01	1.3024E+00	1.9980E+00	2.0425E-01	1.632E+00	8.903E-03
1.488440E+02	7.92969E+01	1.1649E+00	1.6718E+00	1.9123E-01	1.368E+00	8.329E-03
1.591356E+02	7.93074E+01	1.0421E+00	1.3990E+00	1.7944E-01	1.147E+00	7.791E-03
1.701159E+02	7.93102E+01	9.3205E-01	1.1705E+00	1.6877E-01	9.607E-01	7.288E-03
1.818539E+02	7.93069E+01	8.3281E-01	9.7838E-01	1.5908E-01	8.038E-01	6.818E-03
1.944018E+02	7.92990E+01	7.4421E-01	8.1787E-01	1.5027E-01	6.725E-01	6.378E-03
2.078156E+02	7.92880E+01	6.6511E-01	6.8376E-01	1.4223E-01	5.627E-01	5.966E-03
2.221548E+02	7.92750E+01	5.9448E-01	5.7170E-01	1.3489E-01	4.708E-01	5.581E-03
2.374835E+02	7.92607E+01	5.3140E-01	4.7805E-01	1.2816E-01	3.939E-01	5.221E-03
2.538699E+02	7.92457E+01	4.7505E-01	3.9978E-01	1.2197E-01	3.296E-01	4.884E-03
2.713869E+02	7.92304E+01	4.2472E-01	3.3435E-01	1.1625E-01	2.757E-01	4.569E-03
2.901126E+02	7.92152E+01	3.7976E-01	2.7966E-01	1.1096E-01	2.307E-01	4.274E-03
3.101304E+02	7.92002E+01	3.3958E-01	2.3393E-01	1.0604E-01	1.930E-01	3.998E-03
3.315294E+02	7.91857E+01	3.0368E-01	1.9570E-01	1.0145E-01	1.615E-01	3.740E-03
3.544049E+02	7.91718E+01	2.7160E-01	1.6372E-01	9.7148E-02	1.351E-01	3.498E-03
3.788588E+02	7.91585E+01	2.4292E-01	1.3699E-01	9.3105E-02	1.131E-01	3.273E-03
4.050001E+02	7.91459E+01	2.1729E-01	1.1462E-01	8.9290E-02	9.459E-02	3.061E-03
4.329451E+02	7.91340E+01	1.9438E-01	9.5918E-02	8.5677E-02	7.914E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 553

Hg Z = 80

Atomic weight = 2.005900E+02 g/mol, nominal density ρ (g/cm³) = 1.3522E+01

μ_0 (barns/atom) = μ (cm²/g) \times 3.33088E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.09783E+05

22 edges. Edge energies (keV):

K		8.31023E+00	L	I	1.48393E+00	L	II	1.42087E+00	L	III	1.22839E+01
M	I	3.56160E+00	M	II	3.27850E+00	M	III	2.84710E+00	M	IV	2.38490E+00
M	V	2.29490E+00	N	I	8.00300E-00	N	II	6.76900E-00	N	III	5.71000E-01
N	IV	3.78300E-00	N	V	3.59800E-00	O	I	1.02200E-00	N	VI	9.85000E-02
N	VII	1.20300E-00	O	II	8.05000E-02	O	III	5.76000E-02	O	IV	6.40000E-03
O	V	6.40000E-03	P	I	7.71361E-03						

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.7805E+00, -1.0458E+00 e/atom

Nuclear Thomson correction f_{NT} = -1.7503E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
6.272000E-03	2.49501E+00	0.0000E+00	0.0000E+00	1.8668E-05	0.000E+00	1.977E+02
6.368000E-03	1.42832E+00	0.0000E+00	0.0000E+00	2.0206E-05	0.000E+00	1.947E+02
6.393600E-03	2.00589E-01	0.0000E+00	0.0000E+00	2.0632E-05	0.000E+00	1.939E+02
6.432000E-03	1.44193E+00	2.3873E+00	7.7863E+04	2.1285E-05	0.000E+00	1.928E+02
6.528000E-03	2.48802E+00	2.3365E+00	7.5086E+04	2.2984E-05	0.000E+00	1.899E+02
7.559334E-03	3.10590E+00	1.9852E+00	5.5092E+04	4.8476E-05	0.000E+00	1.640E+02
7.675038E-03	2.74244E+00	1.9863E+00	5.4292E+04	5.2294E-05	0.000E+00	1.615E+02
7.705893E-03	2.33399E+00	1.9879E+00	5.4117E+04	5.3350E-05	0.000E+00	1.609E+02
7.752174E-03	2.73258E+00	2.7770E+00	7.5150E+04	5.4963E-05	0.000E+00	1.599E+02
7.867878E-03	3.05471E+00	2.7791E+00	7.4100E+04	5.9156E-05	0.000E+00	1.576E+02
1.069000E-02	2.45759E+00	4.1468E+00	8.1377E+04	2.5564E-04	0.000E+00	1.160E+02
1.142761E-02	2.16853E+00	4.8442E+00	8.8928E+04	3.4654E-04	0.000E+00	1.085E+02
1.221612E-02	1.93957E+00	5.7226E+00	9.8272E+04	4.6739E-04	0.000E+00	1.015E+02
1.305903E-02	1.82849E+00	6.7781E+00	1.0889E+05	6.2720E-04	0.000E+00	9.494E+01
1.396010E-02	1.89424E+00	7.9896E+00	1.2006E+05	8.3744E-04	0.000E+00	8.881E+01
1.492335E-02	2.19117E+00	9.3163E+00	1.3096E+05	1.1126E-03	0.000E+00	8.308E+01
1.595306E-02	2.76201E+00	1.0699E+01	1.4069E+05	1.4708E-03	0.000E+00	7.772E+01
1.705382E-02	3.63080E+00	1.2063E+01	1.4839E+05	1.9349E-03	0.000E+00	7.270E+01
1.823053E-02	4.79730E+00	1.3327E+01	1.5335E+05	2.5329E-03	0.000E+00	6.801E+01
1.948844E-02	6.38775E+00	1.4409E+01	1.5510E+05	3.2996E-03	0.000E+00	6.362E+01
2.083314E-02	8.04416E+00	1.5239E+01	1.5345E+05	4.2776E-03	0.000E+00	5.951E+01
2.227063E-02	9.84804E+00	1.5767E+01	1.4852E+05	5.5189E-03	0.000E+00	5.567E+01
2.380730E-02	1.17169E+01	1.5967E+01	1.4070E+05	7.0864E-03	0.000E+00	5.208E+01
2.545001E-02	1.35693E+01	1.5841E+01	1.3057E+05	9.0560E-03	0.000E+00	4.872E+01
2.770606E-02	1.53789E+01	1.5400E+01	1.1875E+05	1.1518E-02	0.000E+00	4.557E+01
2.908327E-02	1.69150E+01	1.4680E+01	1.0589E+05	1.4582E-02	0.000E+00	4.263E+01
3.109002E-02	1.82727E+01	1.3750E+01	9.2780E+04	1.8374E-02	0.000E+00	3.988E+01
3.323523E-02	1.93757E+01	1.2683E+01	8.0058E+04	2.3045E-02	0.000E+00	3.731E+01
3.552846E-02	2.02196E+01	1.1547E+01	6.8179E+04	2.8771E-02	0.000E+00	3.490E+01
3.797993E-02	2.08155E+01	1.0396E+01	5.7425E+04	3.5756E-02	0.000E+00	3.264E+01
4.060054E-02	2.11830E+01	9.2771E+00	4.7935E+04	4.4234E-02	0.000E+00	3.054E+01
4.340198E-02	2.13436E+01	8.2200E+00	3.9731E+04	5.4476E-02	0.000E+00	2.857E+01
4.639671E-02	2.13123E+01	7.2453E+00	3.2760E+04	6.6789E-02	0.000E+00	2.672E+01
4.959809E-02	2.10827E+01	6.3634E+00	2.6915E+04	8.1520E-02	0.000E+00	2.500E+01
5.302035E-02	2.05739E+01	5.5774E+00	2.2068E+04	9.9060E-02	0.000E+00	2.338E+01
5.644800E-02	1.92513E+01	4.9250E+00	1.8303E+04	1.1847E-01	0.000E+00	2.196E+01
5.667876E-02	1.90360E+01	4.8852E+00	1.8082E+04	1.1984E-01	0.000E+00	2.187E+01
5.731200E-02	1.79046E+01	4.7787E+00	1.7492E+04	1.2365E-01	0.000E+00	2.163E+01
5.754240E-02	1.63099E+01	4.7409E+00	1.7284E+04	1.2506E-01	0.000E+00	2.155E+01
5.788800E-02	1.79732E+01	7.8113E+00	2.8308E+04	1.2717E-01	0.000E+00	2.142E+01
5.875200E-02	1.94028E+01	5.739E+00	2.7044E+04	1.3255E-01	0.000E+00	2.110E+01
6.058959E-02	2.03418E+01	7.1042E+00	2.4597E+04	1.4436E-01	0.000E+00	2.046E+01
6.477028E-02	2.09820E+01	6.1885E+00	2.0044E+04	1.7313E-01	0.000E+00	1.914E+01
6.923942E-02	2.10514E+01	5.3921E+00	1.6337E+04	2.0674E-01	0.000E+00	1.791E+01
7.401695E-02	2.07897E+01	4.7069E+00	1.3341E+04	2.4583E-01	0.000E+00	1.675E+01
7.889000E-02	2.00015E+01	4.1481E+00	1.1030E+04	2.8891E-01	0.000E+00	1.572E+01
7.912411E-02	1.99183E+01	4.1242E+00	1.0935E+04	2.9106E-01	0.000E+00	1.567E+01
8.009750E-02	1.92918E+01	4.0276E+00	1.0549E+04	3.0007E-01	0.000E+00	1.548E+01
8.041950E-02	1.84995E+01	3.9966E+00	1.0426E+04	3.0307E-01	0.000E+00	1.542E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
8.090250E-02	1.92719E+01	5.4765E+00	1.4201E+04	3.0761E-01	0.000E+00	1.533E+01
8.211000E-02	1.99056E+01	5.3527E+00	1.3676E+04	3.1908E-01	0.000E+00	1.510E+01
8.458368E-02	2.02531E+01	5.1173E+00	1.2692E+04	3.4315E-01	0.000E+00	1.466E+01
9.041995E-02	2.03692E+01	4.6406E+00	1.0767E+04	4.0288E-01	0.000E+00	1.371E+01
9.653000E-02	2.00752E+01	4.1848E+00	9.0945E+03	4.6958E-01	0.000E+00	1.284E+01
9.665893E-02	2.00607E+01	4.1755E+00	9.0623E+03	4.7103E-01	0.000E+00	1.283E+01
9.800750E-02	1.98095E+01	4.0799E+00	8.7329E+03	4.8632E-01	0.000E+00	1.265E+01
9.840150E-02	1.95494E+01	4.0524E+00	8.6393E+03	4.9082E-01	0.000E+00	1.260E+01
9.899250E-02	1.97596E+01	4.4825E+00	9.4993E+03	4.9760E-01	0.000E+00	1.252E+01
1.001560E-01	1.98640E+01	4.4029E+00	9.2222E+03	5.1106E-01	0.000E+00	1.238E+01
1.004700E-01	1.98637E+01	4.3818E+00	9.1492E+03	5.1471E-01	0.000E+00	1.234E+01
1.016890E-01	1.97713E+01	4.3008E+00	8.8724E+03	5.2900E-01	0.000E+00	1.219E+01
1.020978E-01	1.96098E+01	4.2740E+00	8.7820E+03	5.3382E-01	0.000E+00	1.214E+01
1.027110E-01	1.97752E+01	4.5570E+00	9.3074E+03	5.4109E-01	0.000E+00	1.207E+01
1.033284E-01	1.98528E+01	4.5185E+00	9.1736E+03	5.4844E-01	0.000E+00	1.200E+01
1.042444E-01	1.99021E+01	4.4623E+00	8.9801E+03	5.5941E-01	0.000E+00	1.189E+01
1.104581E-01	1.98318E+01	4.1148E+00	7.8148E+03	6.3595E-01	0.000E+00	1.122E+01
1.178940E-01	1.94244E+01	3.8128E+00	6.7846E+03	7.3196E-01	0.000E+00	1.052E+01
1.180797E-01	1.94106E+01	3.8071E+00	6.7638E+03	7.3441E-01	0.000E+00	1.050E+01
1.196985E-01	1.92669E+01	3.7608E+00	6.5912E+03	7.5593E-01	0.000E+00	1.036E+01
1.201797E-01	1.91823E+01	3.7483E+00	6.5430E+03	7.6236E-01	0.000E+00	1.032E+01
1.209015E-01	1.91886E+01	3.8387E+00	6.6608E+03	7.7205E-01	0.000E+00	1.025E+01
1.227060E-01	1.91141E+01	3.8085E+00	6.5111E+03	7.9643E-01	0.000E+00	1.010E+01
1.262272E-01	1.88983E+01	3.7697E+00	6.2651E+03	8.4469E-01	0.000E+00	9.822E+00
1.349368E-01	1.82729E+01	3.7829E+00	5.8812E+03	9.6762E-01	0.000E+00	9.188E+00
1.442475E-01	1.75385E+01	3.9599E+00	5.7590E+03	1.1040E+00	0.000E+00	8.595E+00
1.542005E-01	1.67188E+01	4.3288E+00	5.8891E+03	1.2547E+00	0.000E+00	8.040E+00
1.648404E-01	1.58389E+01	4.9248E+00	6.2675E+03	1.4203E+00	0.000E+00	7.521E+00
1.762144E-01	1.49425E+01	5.7859E+00	6.8881E+03	1.6015E+00	0.000E+00	7.036E+00
1.883732E-01	1.40719E+01	6.9460E+00	7.7355E+03	1.7988E+00	0.000E+00	6.582E+00
2.013709E-01	1.33063E+01	8.4265E+00	8.7785E+03	2.0127E+00	0.000E+00	6.157E+00
2.152655E-01	1.27330E+01	1.0226E+01	9.9659E+03	2.2434E+00	0.000E+00	5.760E+00
2.301188E-01	1.24451E+01	1.2315E+01	1.1226E+04	2.4911E+00	0.000E+00	5.388E+00
2.459970E-01	1.25328E+01	1.4627E+01	1.2473E+04	2.7557E+00	0.000E+00	5.040E+00
2.629708E-01	1.30524E+01	1.7066E+01	1.3614E+04	3.0371E+00	0.000E+00	4.715E+00
2.811158E-01	1.40382E+01	1.9513E+01	1.4562E+04	3.3349E+00	0.000E+00	4.410E+00
3.005128E-01	1.54764E+01	2.1838E+01	1.5245E+04	3.6485E+00	0.000E+00	4.126E+00
3.212482E-01	1.72942E+01	2.3915E+01	1.5617E+04	3.9770E+00	0.000E+00	3.859E+00
3.434143E-01	1.93207E+01	2.5639E+01	1.5662E+04	4.3194E+00	0.000E+00	3.610E+00
3.526040E-01	2.00658E+01	2.6205E+01	1.5591E+04	4.4585E+00	0.000E+00	3.516E+00
3.580010E-01	2.03115E+01	2.6499E+01	1.5528E+04	4.5394E+00	0.000E+00	3.463E+00
3.594402E-01	2.01357E+01	2.6573E+01	1.5509E+04	4.5609E+00	0.000E+00	3.449E+00
3.615990E-01	2.06264E+01	2.7286E+01	1.5830E+04	4.5930E+00	0.000E+00	3.429E+00
3.671099E-01	2.13794E+01	2.7585E+01	1.5763E+04	4.6745E+00	0.000E+00	3.377E+00
3.707340E-01	2.17622E+01	2.7768E+01	1.5713E+04	4.7278E+00	0.000E+00	3.344E+00
3.764085E-01	2.22111E+01	2.8033E+01	1.5623E+04	4.8106E+00	0.000E+00	3.294E+00
3.779217E-01	2.21524E+01	2.8099E+01	1.5598E+04	4.8326E+00	0.000E+00	3.281E+00
3.801915E-01	2.26131E+01	2.8637E+01	1.5801E+04	4.8655E+00	0.000E+00	3.261E+00
3.858660E-01	2.34096E+01	2.8891E+01	1.5707E+04	4.9471E+00	0.000E+00	3.213E+00
3.924405E-01	2.41932E+01	2.9159E+01	1.5587E+04	5.0409E+00	0.000E+00	3.159E+00
4.195189E-01	2.71474E+01	2.9963E+01	1.4983E+04	5.4168E+00	0.000E+00	2.955E+00
4.484657E-01	3.00221E+01	3.0316E+01	1.4181E+04	5.8004E+00	0.000E+00	2.765E+00
4.794098E-01	3.27346E+01	3.0258E+01	1.3241E+04	6.1897E+00	0.000E+00	2.586E+00
5.124891E-01	3.51754E+01	2.9858E+01	1.2222E+04	6.5825E+00	0.000E+00	2.419E+00
5.478508E-01	3.71185E+01	2.9185E+01	1.1176E+04	6.9763E+00	0.000E+00	2.263E+00
5.595800E-01	3.74501E+01	2.8926E+01	1.0844E+04	7.1011E+00	0.000E+00	2.216E+00
5.681450E-01	3.71756E+01	2.8729E+01	1.0608E+04	7.1905E+00	0.000E+00	2.182E+00
5.704290E-01	3.64011E+01	2.8675E+01	1.0546E+04	7.2141E+00	0.000E+00	2.174E+00
5.738550E-01	3.74982E+01	3.0361E+01	1.1099E+04	7.2493E+00	0.000E+00	2.161E+00
5.824200E-01	3.87480E+01	3.0161E+01	1.0864E+04	7.3363E+00	0.000E+00	2.129E+00
5.856525E-01	3.90611E+01	3.0085E+01	1.0776E+04	7.3687E+00	0.000E+00	2.117E+00
6.260625E-01	4.17474E+01	2.9090E+01	9.7477E+03	7.7571E+00	0.000E+00	1.980E+00
6.633620E-01	4.34334E+01	2.8147E+01	8.9012E+03	8.0888E+00	0.000E+00	1.869E+00
6.692609E-01	4.36199E+01	2.7997E+01	8.7759E+03	8.1390E+00	0.000E+00	1.853E+00
6.735155E-01	4.36995E+01	2.7890E+01	8.6870E+03	8.1748E+00	0.000E+00	1.841E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 555

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
6.762231E-01	4.36130E+01	2.7821E+01	8.6310E+03	8.1974E+00	0.000E+00	1.833E+00
6.802845E-01	4.39759E+01	2.8108E+01	8.6678E+03	8.2311E+00	0.000E+00	1.823E+00
6.904380E-01	4.45465E+01	2.7858E+01	8.4645E+03	8.3142E+00	0.000E+00	1.796E+00
7.154399E-01	4.55796E+01	2.7250E+01	7.9903E+03	8.5115E+00	0.000E+00	1.733E+00
7.648052E-01	4.71400E+01	2.6089E+01	7.1560E+03	8.8721E+00	0.000E+00	1.621E+00
7.842940E-01	4.75813E+01	2.5647E+01	6.8601E+03	9.0044E+00	0.000E+00	1.581E+00
7.962985E-01	4.76760E+01	2.5380E+01	6.6864E+03	9.0833E+00	0.000E+00	1.557E+00
7.994997E-01	4.74839E+01	2.5310E+01	6.6411E+03	9.1039E+00	0.000E+00	1.551E+00
8.043015E-01	4.78898E+01	2.5749E+01	6.7159E+03	9.1347E+00	0.000E+00	1.542E+00
8.163060E-01	4.84397E+01	2.5491E+01	6.5508E+03	9.2102E+00	0.000E+00	1.519E+00
8.175768E-01	4.84850E+01	2.5464E+01	6.5337E+03	9.2181E+00	0.000E+00	1.516E+00
8.739896E-01	5.00290E+01	2.4308E+01	5.8347E+03	9.5469E+00	0.000E+00	1.419E+00
9.342948E-01	5.12853E+01	2.3171E+01	5.2027E+03	9.8561E+00	0.000E+00	1.327E+00
9.987612E-01	5.24080E+01	2.2055E+01	4.6325E+03	1.0143E+01	0.000E+00	1.241E+00
1.067676E+00	5.33098E+01	2.0588E+01	4.0452E+03	1.0407E+01	0.000E+00	1.161E+00
1.141345E+00	5.39457E+01	1.9215E+01	3.5318E+03	1.0644E+01	0.000E+00	1.086E+00
1.220098E+00	5.43299E+01	1.7929E+01	3.0827E+03	1.0853E+01	0.000E+00	1.016E+00
1.304285E+00	5.45090E+01	1.6739E+01	2.6923E+03	1.1033E+01	0.000E+00	9.506E-01
1.394281E+00	5.44987E+01	1.5637E+01	2.3527E+03	1.1182E+01	0.000E+00	8.892E-01
1.490486E+00	5.42797E+01	1.4563E+01	2.0498E+03	1.1299E+01	0.000E+00	8.318E-01
1.593329E+00	5.37446E+01	1.3482E+01	1.7751E+03	1.1385E+01	0.000E+00	7.781E-01
1.703269E+00	5.27840E+01	1.2486E+01	1.5378E+03	1.1437E+01	0.000E+00	7.279E-01
1.820795E+00	5.12332E+01	1.1581E+01	1.3343E+03	1.1457E+01	0.000E+00	6.809E-01
1.946430E+00	4.86179E+01	1.0710E+01	1.1543E+03	1.1445E+01	0.000E+00	6.370E-01
2.080733E+00	4.35370E+01	9.8874E+00	9.9686E+02	1.1400E+01	0.000E+00	5.959E-01
2.224304E+00	2.77165E+01	9.1517E+00	8.6313E+02	1.1323E+01	0.000E+00	5.574E-01
2.249002E+00	1.99052E+01	9.0375E+00	8.4300E+02	1.1308E+01	0.000E+00	5.513E-01
2.283425E+00	-1.16318E+01	8.8836E+00	8.1615E+02	1.1285E+01	0.000E+00	5.430E-01
2.292605E+00	-5.92850E+01	8.8421E+00	8.0909E+02	1.1278E+01	0.000E+00	5.408E-01
2.306374E+00	1.39125E+01	1.0209E+02	9.2854E+03	1.1269E+01	0.000E+00	5.376E-01
2.337202E+00	5.29137E+01	6.2712E+01	5.6289E+03	1.1247E+01	0.000E+00	5.305E-01
2.340798E+00	5.35253E+01	5.9387E+01	5.3222E+03	1.1244E+01	0.000E+00	5.297E-01
2.372976E+00	3.81090E+01	3.7457E+01	3.3114E+03	1.1220E+01	0.000E+00	5.225E-01
2.377781E+00	2.83192E+01	3.5127E+01	3.0991E+03	1.1216E+01	0.000E+00	5.214E-01
2.382515E+00	4.85257E+00	3.3016E+01	2.9071E+03	1.1213E+01	0.000E+00	5.204E-01
2.396825E+00	5.52892E+01	9.2397E+01	8.0870E+03	1.1201E+01	0.000E+00	5.173E-01
2.432598E+00	8.11860E+01	5.6480E+01	4.8707E+03	1.1173E+01	0.000E+00	5.097E-01
2.541848E+00	6.96203E+01	2.5714E+01	2.1222E+03	1.1080E+01	0.000E+00	4.878E-01
2.717235E+00	6.09630E+01	2.4096E+01	1.8603E+03	1.0916E+01	0.000E+00	4.563E-01
2.790158E+00	5.94034E+01	2.4711E+01	1.8580E+03	1.0843E+01	0.000E+00	4.444E-01
2.832865E+00	5.76423E+01	2.5198E+01	1.8660E+03	1.0800E+01	0.000E+00	4.377E-01
2.844253E+00	5.54458E+01	2.5312E+01	1.8669E+03	1.0788E+01	0.000E+00	4.359E-01
2.861336E+00	5.79072E+01	2.9973E+01	2.1975E+03	1.0771E+01	0.000E+00	4.333E-01
2.904724E+00	6.05959E+01	3.0192E+01	2.1805E+03	1.0726E+01	0.000E+00	4.268E-01
3.105150E+00	6.63560E+01	2.8327E+01	1.9138E+03	1.0511E+01	0.000E+00	3.993E-01
3.212930E+00	6.74386E+01	2.6827E+01	1.7516E+03	1.0392E+01	0.000E+00	3.859E-01
3.262108E+00	6.72353E+01	2.6187E+01	1.6840E+03	1.0338E+01	0.000E+00	3.801E-01
3.275222E+00	6.64680E+01	2.6020E+01	1.6666E+03	1.0323E+01	0.000E+00	3.786E-01
3.294893E+00	6.75720E+01	2.7543E+01	1.7536E+03	1.0301E+01	0.000E+00	3.763E-01
3.319406E+00	6.83277E+01	2.7214E+01	1.7199E+03	1.0274E+01	0.000E+00	3.735E-01
3.344070E+00	6.88083E+01	2.6890E+01	1.6869E+03	1.0246E+01	0.000E+00	3.708E-01
3.490368E+00	7.02522E+01	2.5120E+01	1.5098E+03	1.0081E+01	0.000E+00	3.552E-01
3.543792E+00	7.02425E+01	2.4545E+01	1.4530E+03	1.0021E+01	0.000E+00	3.499E-01
3.548445E+00	7.01763E+01	2.4496E+01	1.4482E+03	1.0016E+01	0.000E+00	3.494E-01
3.558038E+00	6.98032E+01	2.4396E+01	1.4384E+03	1.0005E+01	0.000E+00	3.485E-01
3.579408E+00	7.05190E+01	2.5257E+01	1.4803E+03	9.9808E+00	0.000E+00	3.464E-01
3.632832E+00	7.13818E+01	2.4719E+01	1.4274E+03	9.9205E+00	0.000E+00	3.413E-01
3.793288E+00	7.27328E+01	2.3218E+01	1.2840E+03	9.7396E+00	0.000E+00	3.269E-01
4.055024E+00	7.40664E+01	2.1115E+01	1.0924E+03	9.4473E+00	0.000E+00	3.058E-01
4.334821E+00	7.50256E+01	1.9737E+01	9.3099E+02	9.1410E+00	0.000E+00	2.860E-01
4.633924E+00	7.59463E+01	1.7504E+01	7.9243E+02	8.8230E+00	0.000E+00	2.676E-01
4.953664E+00	7.65841E+01	1.5812E+01	6.6962E+02	8.4956E+00	0.000E+00	2.503E-01
5.295467E+00	7.68720E+01	1.4279E+01	5.6566E+02	8.1608E+00	0.000E+00	2.341E-01
5.660855E+00	7.70240E+01	1.2915E+01	4.7863E+02	7.8207E+00	0.000E+00	2.190E-01
6.051453E+00	7.71770E+01	1.1662E+01	4.0427E+02	7.4775E+00	0.000E+00	2.049E-01

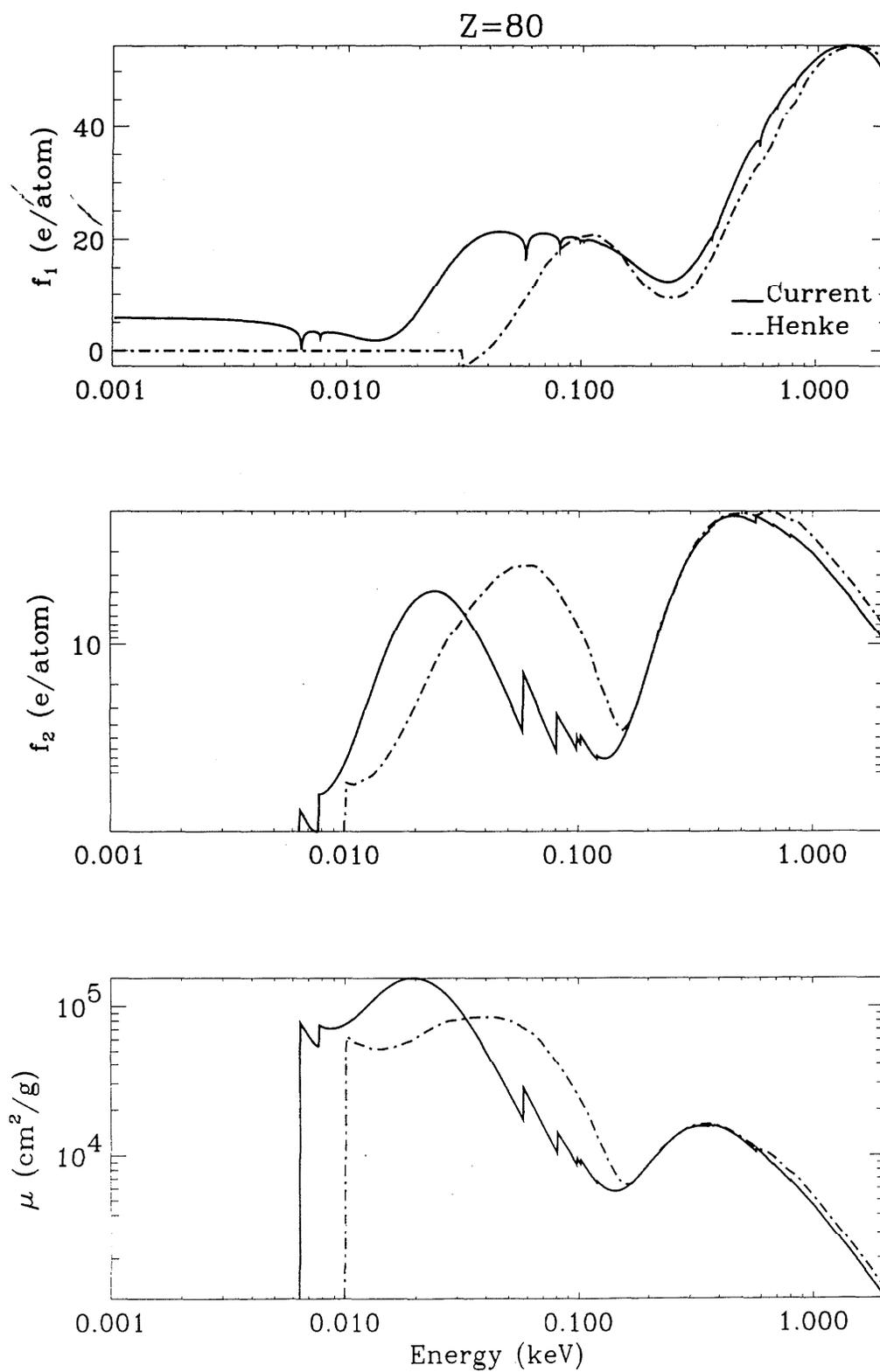
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

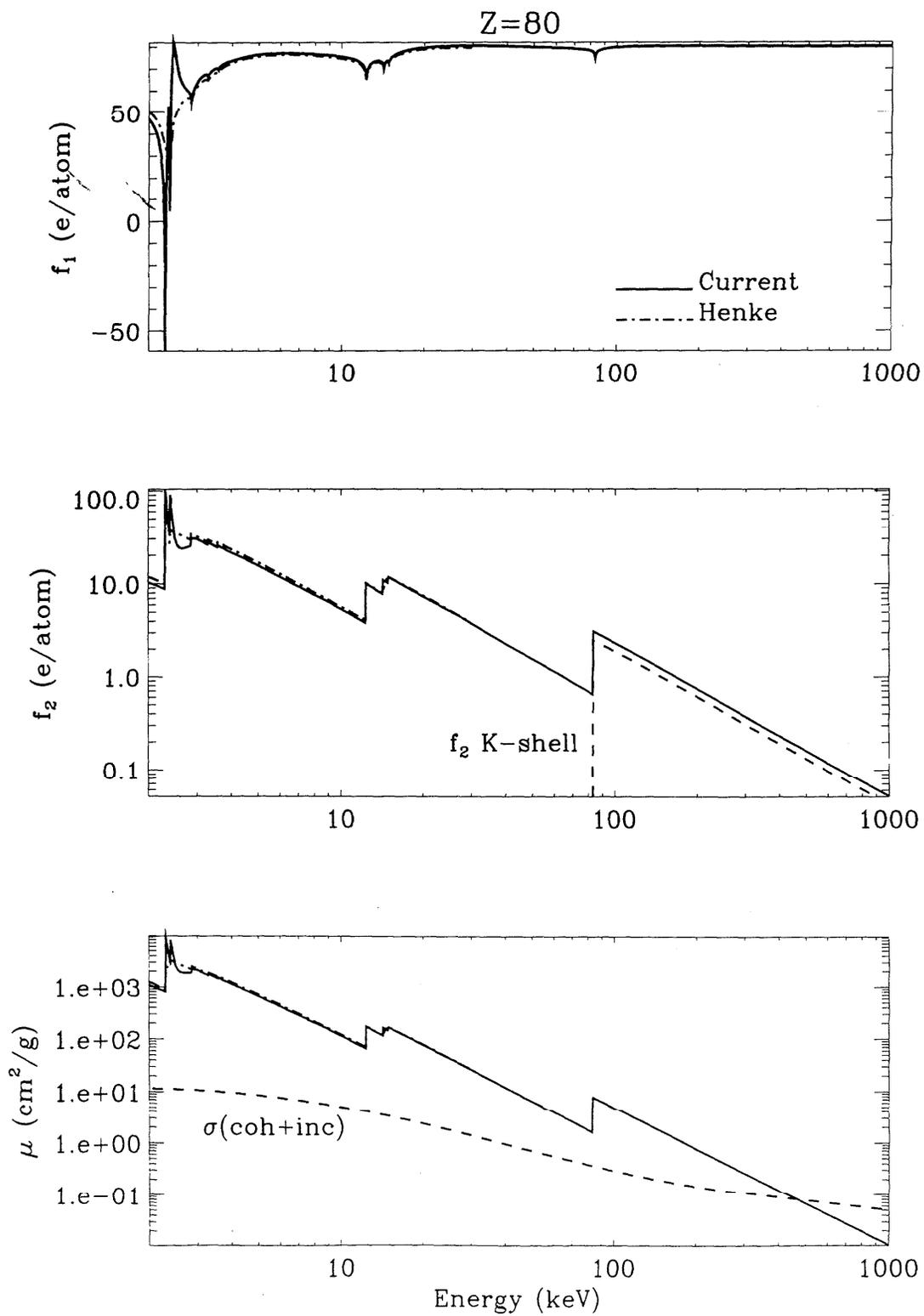
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.469004E+00	7.71401E+01	1.0545E+01	3.4195E+02	7.1331E+00	0.000E+00	1.917E-01
6.915365E+00	7.70805E+01	9.5353E+00	2.8926E+02	6.7892E+00	0.000E+00	1.793E-01
7.392525E+00	7.69386E+01	8.6207E+00	2.4464E+02	6.4477E+00	0.000E+00	1.677E-01
7.902609E+00	7.67251E+01	7.8015E+00	2.0710E+02	6.1100E+00	0.000E+00	1.569E-01
8.447890E+00	7.64642E+01	7.0715E+00	1.7560E+02	5.7777E+00	0.000E+00	1.468E-01
9.030794E+00	7.61838E+01	6.3981E+00	1.4863E+02	5.4520E+00	0.000E+00	1.373E-01
9.653919E+00	7.57597E+01	5.7278E+00	1.2447E+02	5.1340E+00	0.000E+00	1.284E-01
1.032004E+01	7.51472E+01	5.1273E+00	1.0423E+02	4.8249E+00	0.000E+00	1.201E-01
1.103212E+01	7.42114E+01	4.5818E+00	8.7126E+01	4.5255E+00	0.000E+00	1.124E-01
1.179334E+01	7.23323E+01	4.1008E+00	7.2945E+01	4.2364E+00	0.000E+00	1.051E-01
1.203822E+01	7.09760E+01	3.9647E+00	6.9090E+01	4.1496E+00	0.000E+00	1.030E-01
1.222248E+01	6.82600E+01	3.8675E+00	6.6380E+01	4.0861E+00	0.000E+00	1.014E-01
1.227162E+01	6.50762E+01	3.8422E+00	6.5683E+01	4.0694E+00	0.000E+00	1.010E-01
1.234532E+01	6.82479E+01	1.0028E+01	1.7041E+02	4.0446E+00	0.000E+00	1.004E-01
1.252958E+01	7.10452E+01	9.7696E+00	1.6357E+02	3.9836E+00	0.000E+00	9.895E-02
1.260708E+01	7.15833E+01	9.6640E+00	1.6081E+02	3.9584E+00	0.000E+00	9.834E-02
1.347697E+01	7.35382E+01	8.5946E+00	1.3378E+02	3.6918E+00	0.000E+00	9.200E-02
1.392453E+01	7.31608E+01	8.1174E+00	1.2230E+02	3.5656E+00	0.000E+00	8.904E-02
1.413766E+01	7.19530E+01	7.9052E+00	1.1730E+02	3.5079E+00	0.000E+00	8.770E-02
1.419449E+01	7.03784E+01	7.8501E+00	1.1602E+02	3.4927E+00	0.000E+00	8.735E-02
1.427974E+01	7.20100E+01	1.0908E+01	1.6024E+02	3.4702E+00	0.000E+00	8.683E-02
1.440688E+01	7.30797E+01	1.0743E+01	1.5644E+02	3.4371E+00	0.000E+00	8.606E-02
1.449287E+01	7.34317E+01	1.0634E+01	1.5393E+02	3.4149E+00	0.000E+00	8.555E-02
1.454251E+01	7.35707E+01	1.0572E+01	1.5251E+02	3.4023E+00	0.000E+00	8.526E-02
1.476510E+01	7.36042E+01	1.0301E+01	1.4636E+02	3.3463E+00	0.000E+00	8.397E-02
1.482446E+01	7.29374E+01	1.0231E+01	1.4477E+02	3.3317E+00	0.000E+00	8.363E-02
1.491350E+01	7.39597E+01	1.1735E+01	1.6507E+02	3.3099E+00	0.000E+00	8.314E-02
1.513609E+01	7.51292E+01	1.1469E+01	1.5896E+02	3.2563E+00	0.000E+00	8.191E-02
1.540095E+01	7.58937E+01	1.1166E+01	1.5210E+02	3.1944E+00	0.000E+00	8.050E-02
1.646362E+01	7.75917E+01	1.0054E+01	1.2811E+02	2.9639E+00	0.000E+00	7.531E-02
1.759961E+01	7.85498E+01	9.0411E+00	1.0777E+02	2.7456E+00	0.000E+00	7.045E-02
1.881398E+01	7.91746E+01	8.1288E+00	9.0639E+01	2.5394E+00	0.000E+00	6.590E-02
2.011215E+01	7.95942E+01	7.3007E+00	7.6151E+01	2.3453E+00	0.000E+00	6.165E-02
2.149988E+01	7.98742E+01	6.5577E+00	6.3986E+01	2.1629E+00	0.000E+00	5.767E-02
2.298338E+01	8.00602E+01	5.8932E+00	5.3791E+01	1.9921E+00	0.000E+00	5.395E-02
2.456923E+01	8.02412E+01	5.2991E+00	4.5246E+01	1.8325E+00	0.000E+00	5.046E-02
2.626450E+01	8.03201E+01	4.7609E+00	3.8026E+01	1.6837E+00	0.000E+00	4.721E-02
2.807676E+01	8.03721E+01	4.2505E+00	3.1759E+01	1.5453E+00	0.000E+00	4.416E-02
3.001405E+01	8.04278E+01	3.7827E+00	2.6439E+01	1.4170E+00	0.000E+00	4.131E-02
3.208502E+01	8.03867E+01	3.3608E+00	2.1974E+01	1.2981E+00	0.000E+00	3.864E-02
3.429889E+01	8.03222E+01	2.9883E+00	1.8277E+01	1.1884E+00	0.000E+00	3.615E-02
3.666551E+01	8.02429E+01	2.6592E+00	1.5215E+01	1.0873E+00	0.000E+00	3.381E-02
3.919543E+01	8.01540E+01	2.3682E+00	1.2675E+01	9.9422E-01	0.000E+00	3.163E-02
4.189992E+01	8.00584E+01	2.1106E+00	1.0567E+01	9.0884E-01	0.000E+00	2.959E-02
4.479101E+01	7.99578E+01	1.8826E+00	8.8175E+00	8.3061E-01	0.000E+00	2.768E-02
4.788159E+01	7.98530E+01	1.6806E+00	7.3631E+00	7.5907E-01	0.000E+00	2.589E-02
5.118542E+01	7.97436E+01	1.5013E+00	6.1530E+00	6.9376E-01	0.000E+00	2.422E-02
5.471721E+01	7.96279E+01	1.3407E+00	5.1401E+00	6.3425E-01	0.000E+00	2.266E-02
5.849270E+01	7.95009E+01	1.1966E+00	4.2916E+00	5.8011E-01	0.000E+00	2.120E-02
6.252870E+01	7.93567E+01	1.0684E+00	3.5844E+00	5.3091E-01	0.000E+00	1.983E-02
6.684318E+01	7.91821E+01	9.5129E-01	2.9855E+00	4.8629E-01	0.000E+00	1.855E-02
7.145536E+01	7.89465E+01	8.4623E-01	2.4844E+00	4.4585E-01	0.000E+00	1.735E-02
7.638578E+01	7.85660E+01	7.5312E-01	2.0683E+00	4.0926E-01	0.000E+00	1.623E-02
8.144026E+01	7.75656E+01	6.7195E-01	1.7309E+00	3.7743E-01	0.000E+00	1.522E-02
8.165640E+01	7.74618E+01	6.6864E-01	1.7178E+00	3.7618E-01	0.000E+00	1.518E-02
8.268679E+01	7.65087E+01	6.5321E-01	1.6572E+00	3.7033E-01	0.000E+00	1.499E-02
8.301920E+01	7.52427E+01	6.4835E-01	1.6383E+00	3.6848E-01	0.000E+00	1.493E-02
8.351781E+01	7.65634E+01	3.1333E+00	7.8704E+00	3.6574E-01	6.260E+00	1.485E-02
8.476435E+01	7.77188E+01	3.0616E+00	7.5771E+00	3.5908E-01	6.033E+00	1.463E-02
8.729069E+01	7.85120E+01	2.9234E+00	7.0237E+00	3.4630E-01	5.606E+00	1.420E-02
9.331374E+01	7.92696E+01	2.6296E+00	5.9118E+00	3.1933E-01	4.738E+00	1.329E-02
9.975239E+01	7.96510E+01	2.3616E+00	4.9665E+00	2.9500E-01	3.995E+00	1.243E-02
1.066353E+02	7.98848E+01	2.1189E+00	4.1685E+00	2.7306E-01	3.364E+00	1.163E-02
1.139931E+02	8.00388E+01	1.9006E+00	3.4978E+00	2.5328E-01	2.831E+00	1.088E-02
1.218587E+02	8.01439E+01	1.7028E+00	2.9314E+00	2.3544E-01	2.378E+00	1.017E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 557

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

<i>E</i> keV	<i>f</i> ₁ e/atom	<i>f</i> ₂ e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.302669E+02	8.02131E+01	1.5238E+00	2.4540E+00	2.1936E-01	1.995E+00	9.518E-03
1.392553E+02	8.02578E+01	1.3635E+00	2.0541E+00	2.0484E-01	1.673E+00	8.903E-03
1.488640E+02	8.02851E+01	1.2201E+00	1.7194E+00	1.9172E-01	1.403E+00	8.329E-03
1.591356E+02	8.02998E+01	1.0918E+00	1.4393E+00	1.7987E-01	1.176E+00	7.791E-03
1.701159E+02	8.03056E+01	9.7710E-01	1.2049E+00	1.6912E-01	9.861E-01	7.288E-03
1.818539E+02	8.03049E+01	8.7381E-01	1.0080E+00	1.5938E-01	8.258E-01	6.818E-03
1.944018E+02	8.02990E+01	7.8130E-01	8.4311E-01	1.5052E-01	6.914E-01	6.378E-03
2.078156E+02	8.02894E+01	6.9866E-01	7.0527E-01	1.4244E-01	5.789E-01	5.966E-03
2.221548E+02	8.02774E+01	6.2482E-01	5.9002E-01	1.3506E-01	4.846E-01	5.581E-03
2.374835E+02	8.02639E+01	5.5884E-01	4.9366E-01	1.2830E-01	4.057E-01	5.221E-03
2.538699E+02	8.02494E+01	4.9988E-01	4.1307E-01	1.2208E-01	3.397E-01	4.884E-03
2.713869E+02	8.02345E+01	4.4718E-01	3.4567E-01	1.1634E-01	2.844E-01	4.569E-03
2.901126E+02	8.02195E+01	4.0007E-01	2.8929E-01	1.1102E-01	2.381E-01	4.274E-03
3.101304E+02	8.02046E+01	3.5796E-01	2.4213E-01	1.0607E-01	1.993E-01	3.998E-03
3.315294E+02	8.01901E+01	3.2030E-01	2.0268E-01	1.0146E-01	1.669E-01	3.740E-03
3.544049E+02	8.01761E+01	2.8663E-01	1.6966E-01	9.7129E-02	1.397E-01	3.498E-03
3.788588E+02	8.01627E+01	2.5652E-01	1.4204E-01	9.3060E-02	1.170E-01	3.273E-03
4.050001E+02	8.01500E+01	2.2959E-01	1.1892E-01	8.9217E-02	9.793E-02	3.061E-03
4.329451E+02	8.01380E+01	2.0550E-01	9.9576E-02	8.5576E-02	8.199E-02	2.864E-03





TI Z = 81

Atomic weight = 2.043830E+02 g/mol, nominal density ρ (g/cm³) = 1.1830E+01 μ_a (barns/atom) = μ (cm²/g) \times 3.39386E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.05890E+05

22 edges. Edge energies (keV):

K		8.55304E+00	L	I	1.53467E+00	L	II	1.46979E+00	L	III	1.26575E+01
M	I	3.70410E+00	M	II	3.41570E+00	M	III	2.95660E+00	M	IV	2.48510E+00
M	V	2.38930E+00	N	I	8.45500E-00	N	II	7.21300E-00	N	III	6.09000E-01
N	IV	4.06600E-00	N	V	3.86200E-00	O	I	1.22800E-00	N	VI	1.18500E-01
N	VII	1.36300E-00	O	II	9.96000E-02	O	III	7.54000E-02	O	IV	1.53000E-02
O	V	1.31000E-02	P	I	9.66483E-03						

Relativistic correction estimate f_{rel} (H82.3/5CL) = -1.8396E+00, -1.0794E+00 e/atomNuclear Thomson correction f_{NT} = -1.7610E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
9.471535E-03	2.89482E+00	0.0000E+00	0.0000E+00	1.4636E-04	0.000E+00	1.309E+02
9.616508E-03	2.43653E+00	0.0000E+00	0.0000E+00	1.5724E-04	0.000E+00	1.289E+02
9.655167E-03	1.93601E+00	0.0000E+00	0.0000E+00	1.6024E-04	0.000E+00	1.284E+02
9.713156E-03	2.41962E+00	9.5738E-01	9.5738E-01	1.6482E-04	0.000E+00	1.276E+02
9.858128E-03	2.80732E+00	9.4093E-01	1.9652E+04	1.7668E-04	0.000E+00	1.258E+02
1.069000E-02	3.01632E+00	8.5572E-01	1.6481E+04	2.5723E-04	0.000E+00	1.160E+02
1.142761E-02	2.81513E+00	7.6359E-01	1.3758E+04	3.4852E-04	0.000E+00	1.085E+02
1.221612E-02	2.31826E+00	6.4656E-01	1.0897E+04	4.6983E-04	0.000E+00	1.015E+02
1.283800E-02	1.41314E+00	5.5653E-01	8.9254E+03	5.8486E-04	0.000E+00	9.658E+01
1.303450E-02	4.79375E-01	5.2967E-01	8.3666E+03	6.2504E-04	0.000E+00	9.512E+01
1.305903E-02	1.70913E-01	5.2639E-01	8.2991E+03	6.3019E-04	0.000E+00	9.494E+01
1.308690E-02	-5.76446E-01	5.2267E-01	8.2229E+03	6.3608E-04	0.000E+00	9.474E+01
1.316550E-02	4.89650E-01	2.5504E+00	3.9884E+04	6.5289E-04	0.000E+00	9.417E+01
1.336200E-02	1.35585E+00	2.4444E+00	3.7665E+04	6.9631E-04	0.000E+00	9.279E+01
1.396010E-02	1.81934E+00	2.1538E+00	3.1765E+04	8.4106E-04	0.000E+00	8.881E+01
1.492335E-02	1.26447E+00	1.8083E+00	2.4948E+04	1.1169E-03	0.000E+00	8.308E+01
1.499400E-02	1.16047E+00	1.7938E+00	2.4632E+04	1.1394E-03	0.000E+00	8.269E+01
1.522350E-02	5.44732E-01	1.7565E+00	2.3756E+04	1.2144E-03	0.000E+00	8.144E+01
1.528470E-02	-9.42078E-02	1.7489E+00	2.3558E+04	1.2350E-03	0.000E+00	8.112E+01
1.537650E-02	4.91862E-01	2.9353E+00	3.9304E+04	1.2664E-03	0.000E+00	8.063E+01
1.560600E-02	9.17787E-01	2.8917E+00	3.8150E+04	1.3471E-03	0.000E+00	7.945E+01
1.595306E-02	1.01599E+00	2.8481E+00	3.6757E+04	1.4760E-03	0.000E+00	7.772E+01
1.705382E-02	6.15267E-01	2.8623E+00	3.4556E+04	1.9408E-03	0.000E+00	7.270E+01
1.823053E-02	-2.11345E-01	3.1946E+00	3.6079E+04	2.5397E-03	0.000E+00	6.801E+01
1.948844E-02	-1.22195E+00	3.8982E+00	4.1184E+04	3.3073E-03	0.000E+00	6.362E+01
2.083314E-02	-2.31842E+00	5.0236E+00	4.9647E+04	4.2860E-03	0.000E+00	5.951E+01
2.227063E-02	-3.38921E+00	6.6455E+00	6.1437E+04	5.5279E-03	0.000E+00	5.567E+01
2.380730E-02	-4.27166E+00	8.8266E+00	7.6334E+04	7.0956E-03	0.000E+00	5.208E+01
2.545001E-02	-4.74810E+00	1.1575E+01	9.3643E+04	9.0649E-03	0.000E+00	4.872E+01
2.720606E-02	-4.56925E+00	1.4806E+01	1.1205E+05	1.1526E-02	0.000E+00	4.557E+01
2.908327E-02	-3.50478E+00	1.8312E+01	1.2963E+05	1.4588E-02	0.000E+00	4.263E+01
3.109002E-02	-1.40836E+00	2.1773E+01	1.4419E+05	1.8376E-02	0.000E+00	3.988E+01
3.323523E-02	1.72000E+00	2.4800E+01	1.5363E+05	2.3042E-02	0.000E+00	3.731E+01
3.552846E-02	5.70679E+00	2.7017E+01	1.5656E+05	2.8760E-02	0.000E+00	3.490E+01
3.797993E-02	1.02244E+01	2.8143E+01	1.5256E+05	3.5733E-02	0.000E+00	3.264E+01
4.060054E-02	1.48506E+01	2.8061E+01	1.4230E+05	4.4196E-02	0.000E+00	3.054E+01
4.340198E-02	1.91780E+01	2.6836E+01	1.2730E+05	5.4418E-02	0.000E+00	2.857E+01
4.639671E-02	2.28632E+01	2.4683E+01	1.0953E+05	6.6704E-02	0.000E+00	2.672E+01
4.959809E-02	2.56983E+01	2.1909E+01	9.0947E+04	8.1401E-02	0.000E+00	2.500E+01
5.302035E-02	2.76143E+01	1.8838E+01	7.3154E+04	9.8897E-02	0.000E+00	2.338E+01
5.667876E-02	2.86585E+01	1.5762E+01	5.7258E+04	1.1963E-01	0.000E+00	2.187E+01
6.058959E-02	2.89544E+01	1.2896E+01	4.3821E+04	1.4408E-01	0.000E+00	2.046E+01
6.477028E-02	2.86433E+01	1.0368E+01	3.2956E+04	1.7277E-01	0.000E+00	1.914E+01
6.923942E-02	2.78132E+01	8.2343E+00	2.4485E+04	2.0628E-01	0.000E+00	1.791E+01
7.389200E-02	2.61391E+01	6.5313E+00	1.8198E+04	2.4419E-01	0.000E+00	1.678E+01
7.401695E-02	2.60553E+01	6.4917E+00	1.8058E+04	2.4525E-01	0.000E+00	1.675E+01
7.502300E-02	2.48949E+01	6.1837E+00	1.6970E+04	2.5386E-01	0.000E+00	1.653E+01
7.532460E-02	2.35501E+01	6.0949E+00	1.6660E+04	2.5646E-01	0.000E+00	1.646E+01
7.577700E-02	2.48694E+01	8.5263E+00	2.3166E+04	2.6040E-01	0.000E+00	1.636E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 561

TABLE 1: Form factors, attenuation and scattering cross-sections. Z = 1-92. from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
7.690800E-02	2.59023E+01	8.1044E+00	2.1696E+04	2.7035E-01	0.000E+00	1.612E+01
7.912411E-02	2.63345E+01	7.3530E+00	1.9133E+04	2.9034E-01	0.000E+00	1.567E+01
8.458368E-02	2.61109E+01	5.8588E+00	1.4261E+04	3.4228E-01	0.000E+00	1.466E+01
9.041995E-02	2.53542E+01	4.7070E+00	1.0718E+04	4.0181E-01	0.000E+00	1.371E+01
9.665893E-02	2.41818E+01	3.8281E+00	8.1541E+03	4.6975E-01	0.000E+00	1.283E+01
9.760800E-02	2.39080E+01	3.7182E+00	7.8431E+03	4.8045E-01	0.000E+00	1.270E+01
9.910200E-02	2.31352E+01	3.5558E+00	7.3874E+03	4.9749E-01	0.000E+00	1.251E+01
9.950040E-02	2.23738E+01	3.5146E+00	7.2725E+03	5.0207E-01	0.000E+00	1.246E+01
1.000980E-01	2.30489E+01	4.8603E+00	9.9971E+03	5.0898E-01	0.000E+00	1.239E+01
1.015920E-01	2.35242E+01	4.6850E+00	9.4947E+03	5.2639E-01	0.000E+00	1.220E+01
1.033284E-01	2.36206E+01	4.4954E+00	8.9574E+03	5.4691E-01	0.000E+00	1.200E+01
1.104581E-01	2.32784E+01	3.8498E+00	7.1728E+03	6.3414E-01	0.000E+00	1.122E+01
1.161300E-01	2.26952E+01	3.4384E+00	6.0960E+03	7.0673E-01	0.000E+00	1.068E+01
1.179075E-01	2.23619E+01	3.3227E+00	5.8021E+03	7.3002E-01	0.000E+00	1.052E+01
1.180797E-01	2.23037E+01	3.3118E+00	5.7747E+03	7.3229E-01	0.000E+00	1.050E+01
1.183815E-01	2.21224E+01	3.2929E+00	5.7270E+03	7.3627E-01	0.000E+00	1.047E+01
1.190925E-01	2.22329E+01	3.6236E+00	6.2646E+03	7.4568E-01	0.000E+00	1.041E+01
1.203440E-01	2.22225E+01	3.5593E+00	6.0895E+03	7.6234E-01	0.000E+00	1.030E+01
1.208700E-01	2.21855E+01	3.5332E+00	6.0184E+03	7.6938E-01	0.000E+00	1.026E+01
1.221860E-01	2.20234E+01	3.4700E+00	5.8472E+03	7.8708E-01	0.000E+00	1.015E+01
1.226772E-01	2.18574E+01	3.4473E+00	5.7856E+03	7.9372E-01	0.000E+00	1.011E+01
1.234140E-01	2.19417E+01	3.6815E+00	6.1417E+03	8.0371E-01	0.000E+00	1.005E+01
1.252560E-01	2.19267E+01	3.6150E+00	5.9421E+03	8.2886E-01	0.000E+00	9.898E+00
1.262272E-01	2.18818E+01	3.5824E+00	5.8432E+03	8.4221E-01	0.000E+00	9.822E+00
1.335740E-01	2.13523E+01	3.3886E+00	5.2231E+03	9.4527E-01	0.000E+00	9.282E+00
1.349368E-01	2.12226E+01	3.3636E+00	5.1322E+03	9.6476E-01	0.000E+00	9.188E+00
1.356185E-01	2.11444E+01	3.3524E+00	5.0894E+03	9.7455E-01	0.000E+00	9.142E+00
1.361637E-01	2.10446E+01	3.3441E+00	5.0566E+03	9.8240E-01	0.000E+00	9.106E+00
1.369815E-01	2.10336E+01	3.4424E+00	5.1742E+03	9.9421E-01	0.000E+00	9.051E+00
1.390260E-01	2.09125E+01	3.4222E+00	5.0681E+03	1.0239E+00	0.000E+00	8.918E+00
1.442475E-01	2.05035E+01	3.4079E+00	4.8642E+03	1.1007E+00	0.000E+00	8.595E+00
1.542005E-01	1.96476E+01	3.5226E+00	4.7034E+03	1.2509E+00	0.000E+00	8.040E+00
1.648404E-01	1.87015E+01	3.8405E+00	4.7969E+03	1.4160E+00	0.000E+00	7.521E+00
1.762144E-01	1.76979E+01	4.3944E+00	5.1344E+03	1.5967E+00	0.000E+00	7.036E+00
1.883732E-01	1.66756E+01	5.2206E+00	5.7061E+03	1.7935E+00	0.000E+00	6.582E+00
2.013709E-01	1.56886E+01	6.3526E+00	6.4952E+03	2.0068E+00	0.000E+00	6.157E+00
2.152655E-01	1.48088E+01	7.8117E+00	7.4715E+03	2.2369E+00	0.000E+00	5.760E+00
2.301188E-01	1.41292E+01	9.5974E+00	8.5868E+03	2.4839E+00	0.000E+00	5.388E+00
2.459970E-01	1.37290E+01	1.1679E+01	9.7746E+03	2.7480E+00	0.000E+00	5.040E+00
2.629708E-01	1.37031E+01	1.4004E+01	1.0964E+04	3.0288E+00	0.000E+00	4.715E+00
2.811158E-01	1.41194E+01	1.6464E+01	1.2058E+04	3.3260E+00	0.000E+00	4.410E+00
3.005128E-01	1.50075E+01	1.8944E+01	1.2979E+04	3.6389E+00	0.000E+00	4.126E+00
3.212482E-01	1.63534E+01	2.1308E+01	1.3656E+04	3.9669E+00	0.000E+00	3.859E+00
3.434143E-01	1.80811E+01	2.3426E+01	1.4045E+04	4.3089E+00	0.000E+00	3.610E+00
3.671099E-01	2.00316E+01	2.5189E+01	1.4127E+04	4.6636E+00	0.000E+00	3.377E+00
3.784760E-01	2.08453E+01	2.5854E+01	1.4065E+04	4.8295E+00	0.000E+00	3.276E+00
3.842690E-01	2.10185E+01	2.6150E+01	1.4011E+04	4.9130E+00	0.000E+00	3.226E+00
3.858138E-01	2.07765E+01	2.6224E+01	1.3994E+04	4.9352E+00	0.000E+00	3.214E+00
3.881310E-01	2.13155E+01	2.7056E+01	1.4352E+04	4.9683E+00	0.000E+00	3.194E+00
3.924405E-01	2.19191E+01	2.7282E+01	1.4313E+04	5.0296E+00	0.000E+00	3.159E+00
3.939240E-01	2.20824E+01	2.7357E+01	1.4299E+04	5.0506E+00	0.000E+00	3.147E+00
3.984680E-01	2.25239E+01	2.7576E+01	1.4249E+04	5.1146E+00	0.000E+00	3.112E+00
4.045670E-01	2.29375E+01	2.7848E+01	1.4172E+04	5.1999E+00	0.000E+00	3.065E+00
4.061934E-01	2.28421E+01	2.7916E+01	1.4150E+04	5.2224E+00	0.000E+00	3.052E+00
4.086330E-01	2.33320E+01	2.8524E+01	1.4372E+04	5.2562E+00	0.000E+00	3.034E+00
4.147320E-01	2.41478E+01	2.8789E+01	1.4292E+04	5.3401E+00	0.000E+00	2.990E+00
4.195189E-01	2.46859E+01	2.8983E+01	1.4224E+04	5.4053E+00	0.000E+00	2.955E+00
4.484657E-01	2.76204E+01	2.9895E+01	1.3725E+04	5.7888E+00	0.000E+00	2.765E+00
4.794098E-01	3.04932E+01	3.0414E+01	1.3062E+04	6.1781E+00	0.000E+00	2.586E+00
5.124891E-01	3.32709E+01	3.0514E+01	1.2259E+04	6.5709E+00	0.000E+00	2.419E+00
5.478508E-01	3.58110E+01	3.0214E+01	1.1355E+04	6.9650E+00	0.000E+00	2.263E+00
5.856525E-01	3.78396E+01	2.9591E+01	1.0403E+04	7.3578E+00	0.000E+00	2.117E+00
5.968200E-01	3.81496E+01	2.9367E+01	1.0131E+04	7.4684E+00	0.000E+00	2.077E+00
6.059550E-01	3.78878E+01	2.9174E+01	9.9125E+03	7.5571E+00	0.000E+00	2.046E+00
6.093910E-01	3.71047E+01	2.9121E+01	9.8550E+03	7.5805E+00	0.000E+00	2.038E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.120450E-01	3.82261E+01	3.0838E+01	1.0374E+04	7.6154E+00	0.000E+00	2.026E+00
6.211800E-01	3.95123E+01	3.0641E+01	1.0156E+04	7.7015E+00	0.000E+00	1.996E+00
6.260625E-01	3.99614E+01	3.0533E+01	1.0041E+04	7.7468E+00	0.000E+00	1.980E+00
6.692609E-01	4.27108E+01	2.9527E+01	9.0836E+03	8.1294E+00	0.000E+00	1.853E+00
7.068740E-01	4.43644E+01	2.8612E+01	8.3337E+03	8.4363E+00	0.000E+00	1.754E+00
7.154399E-01	4.46142E+01	2.8402E+01	8.1734E+03	8.5029E+00	0.000E+00	1.733E+00
7.176935E-01	4.46460E+01	2.8346E+01	8.1319E+03	8.5202E+00	0.000E+00	1.728E+00
7.205787E-01	4.45616E+01	2.8276E+01	8.0791E+03	8.5423E+00	0.000E+00	1.721E+00
7.249065E-01	4.49330E+01	2.8563E+01	8.1125E+03	8.5752E+00	0.000E+00	1.710E+00
7.357260E-01	4.55201E+01	2.8304E+01	7.9207E+03	8.6560E+00	0.000E+00	1.685E+00
7.648052E-01	4.66697E+01	2.7614E+01	7.4338E+03	8.8646E+00	0.000E+00	1.621E+00
8.175768E-01	4.82245E+01	2.6402E+01	6.6487E+03	9.2119E+00	0.000E+00	1.516E+00
8.285900E-01	4.84526E+01	2.6157E+01	6.4995E+03	9.2795E+00	0.000E+00	1.496E+00
8.412725E-01	4.85576E+01	2.5878E+01	6.3334E+03	9.3555E+00	0.000E+00	1.474E+00
8.446545E-01	4.83669E+01	2.5805E+01	6.2901E+03	9.3754E+00	0.000E+00	1.468E+00
8.497275E-01	4.87784E+01	2.6242E+01	6.3585E+03	9.4050E+00	0.000E+00	1.459E+00
8.624100E-01	4.93388E+01	2.5973E+01	6.2007E+03	9.4776E+00	0.000E+00	1.438E+00
8.739896E-01	4.97089E+01	2.5731E+01	6.0616E+03	9.5422E+00	0.000E+00	1.419E+00
9.342948E-01	5.11998E+01	2.4531E+01	5.4059E+03	9.8530E+00	0.000E+00	1.327E+00
9.987612E-01	5.25055E+01	2.3358E+01	4.8151E+03	1.0142E+01	0.000E+00	1.241E+00
1.067676E+00	5.39662E+01	2.1752E+01	4.1946E+03	1.0407E+01	0.000E+00	1.161E+00
1.141345E+00	5.47614E+01	2.0251E+01	3.6532E+03	1.0646E+01	0.000E+00	1.086E+00
1.220098E+00	5.52508E+01	1.8868E+01	3.1840E+03	1.0858E+01	0.000E+00	1.016E+00
1.304285E+00	5.55131E+01	1.7580E+01	2.7751E+03	1.1040E+01	0.000E+00	9.506E-01
1.394281E+00	5.55710E+01	1.6394E+01	2.4209E+03	1.1192E+01	0.000E+00	8.892E-01
1.490486E+00	5.54309E+01	1.5296E+01	2.1129E+03	1.1312E+01	0.000E+00	8.318E-01
1.593329E+00	5.50631E+01	1.4238E+01	1.8398E+03	1.1400E+01	0.000E+00	7.781E-01
1.703269E+00	5.43500E+01	1.3180E+01	1.5932E+03	1.1455E+01	0.000E+00	7.279E-01
1.820795E+00	5.31445E+01	1.2203E+01	1.3799E+03	1.1477E+01	0.000E+00	6.809E-01
1.946430E+00	5.11911E+01	1.1315E+01	1.1969E+03	1.1467E+01	0.000E+00	6.370E-01
2.080733E+00	4.77987E+01	1.0507E+01	1.0397E+03	1.1425E+01	0.000E+00	5.959E-01
2.224304E+00	4.04555E+01	9.7718E+00	9.0451E+02	1.1351E+01	0.000E+00	5.574E-01
2.341514E+00	2.00337E+01	9.2162E+00	8.1038E+02	1.1273E+01	0.000E+00	5.295E-01
2.377781E+00	-1.36229E+01	9.0539E+00	7.8397E+02	1.1246E+01	0.000E+00	5.214E-01
2.386911E+00	-6.24114E+01	9.0141E+00	7.7754E+02	1.1239E+01	0.000E+00	5.194E-01
2.401247E+00	1.48703E+01	1.0642E+02	9.1247E+03	1.1228E+01	0.000E+00	5.163E-01
2.435398E+00	5.62027E+01	6.2470E+01	5.2812E+03	1.1201E+01	0.000E+00	5.091E-01
2.437086E+00	5.64494E+01	6.0914E+01	5.1461E+03	1.1200E+01	0.000E+00	5.087E-01
2.472675E+00	4.01681E+01	3.6893E+01	3.0719E+03	1.1171E+01	0.000E+00	5.014E-01
2.482615E+00	6.94009E+00	3.2448E+01	2.6910E+03	1.1163E+01	0.000E+00	4.994E-01
2.497526E+00	5.65153E+01	9.1278E+01	7.5248E+03	1.1150E+01	0.000E+00	4.964E-01
2.534807E+00	8.17379E+01	5.6166E+01	4.5621E+03	1.1118E+01	0.000E+00	4.891E-01
2.541848E+00	8.23065E+01	5.1874E+01	4.2018E+03	1.1112E+01	0.000E+00	4.878E-01
2.717235E+00	6.51780E+01	2.5265E+01	1.9144E+03	1.0950E+01	0.000E+00	4.563E-01
2.897468E+00	6.11562E+01	2.6441E+01	1.8789E+03	1.0769E+01	0.000E+00	4.279E-01
2.904724E+00	6.10278E+01	2.6499E+01	1.8783E+03	1.0762E+01	0.000E+00	4.268E-01
2.941817E+00	5.96662E+01	2.6816E+01	1.8768E+03	1.0723E+01	0.000E+00	4.215E-01
2.953643E+00	5.74518E+01	2.6892E+01	1.8745E+03	1.0711E+01	0.000E+00	4.198E-01
2.971383E+00	6.02481E+01	3.1718E+01	2.1977E+03	1.0692E+01	0.000E+00	4.173E-01
3.015732E+00	6.36669E+01	3.1457E+01	2.1476E+03	1.0645E+01	0.000E+00	4.111E-01
3.05150E+00	6.66810E+01	3.0044E+01	1.9921E+03	1.0549E+01	0.000E+00	3.993E-01
3.319406E+00	6.93427E+01	2.6856E+01	1.6657E+03	1.0313E+01	0.000E+00	3.735E-01
3.347386E+00	6.94312E+01	2.6500E+01	1.6299E+03	1.0282E+01	0.000E+00	3.704E-01
3.398621E+00	6.91174E+01	2.5869E+01	1.5671E+03	1.0225E+01	0.000E+00	3.648E-01
3.412284E+00	6.83151E+01	2.5705E+01	1.5510E+03	1.0210E+01	0.000E+00	3.633E-01
3.432778E+00	6.94038E+01	2.7254E+01	1.6346E+03	1.0187E+01	0.000E+00	3.612E-01
3.484014E+00	7.05821E+01	2.6597E+01	1.5718E+03	1.0129E+01	0.000E+00	3.559E-01
3.548445E+00	7.13213E+01	2.5809E+01	1.4975E+03	1.0057E+01	0.000E+00	3.494E-01
3.630018E+00	7.18289E+01	2.4893E+01	1.4119E+03	9.9654E+00	0.000E+00	3.416E-01
3.685579E+00	7.17837E+01	2.4319E+01	1.3585E+03	9.9030E+00	0.000E+00	3.364E-01
3.700396E+00	7.13393E+01	2.4171E+01	1.3448E+03	9.8864E+00	0.000E+00	3.351E-01
3.722620E+00	7.20356E+01	2.5024E+01	1.3840E+03	9.8614E+00	0.000E+00	3.331E-01
3.778182E+00	7.28614E+01	2.4489E+01	1.3345E+03	9.7991E+00	0.000E+00	3.282E-01
3.793288E+00	7.30141E+01	2.4347E+01	1.3215E+03	9.7822E+00	0.000E+00	3.269E-01
4.055024E+00	7.47009E+01	2.2107E+01	1.1224E+03	9.4910E+00	0.000E+00	3.058E-01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 563

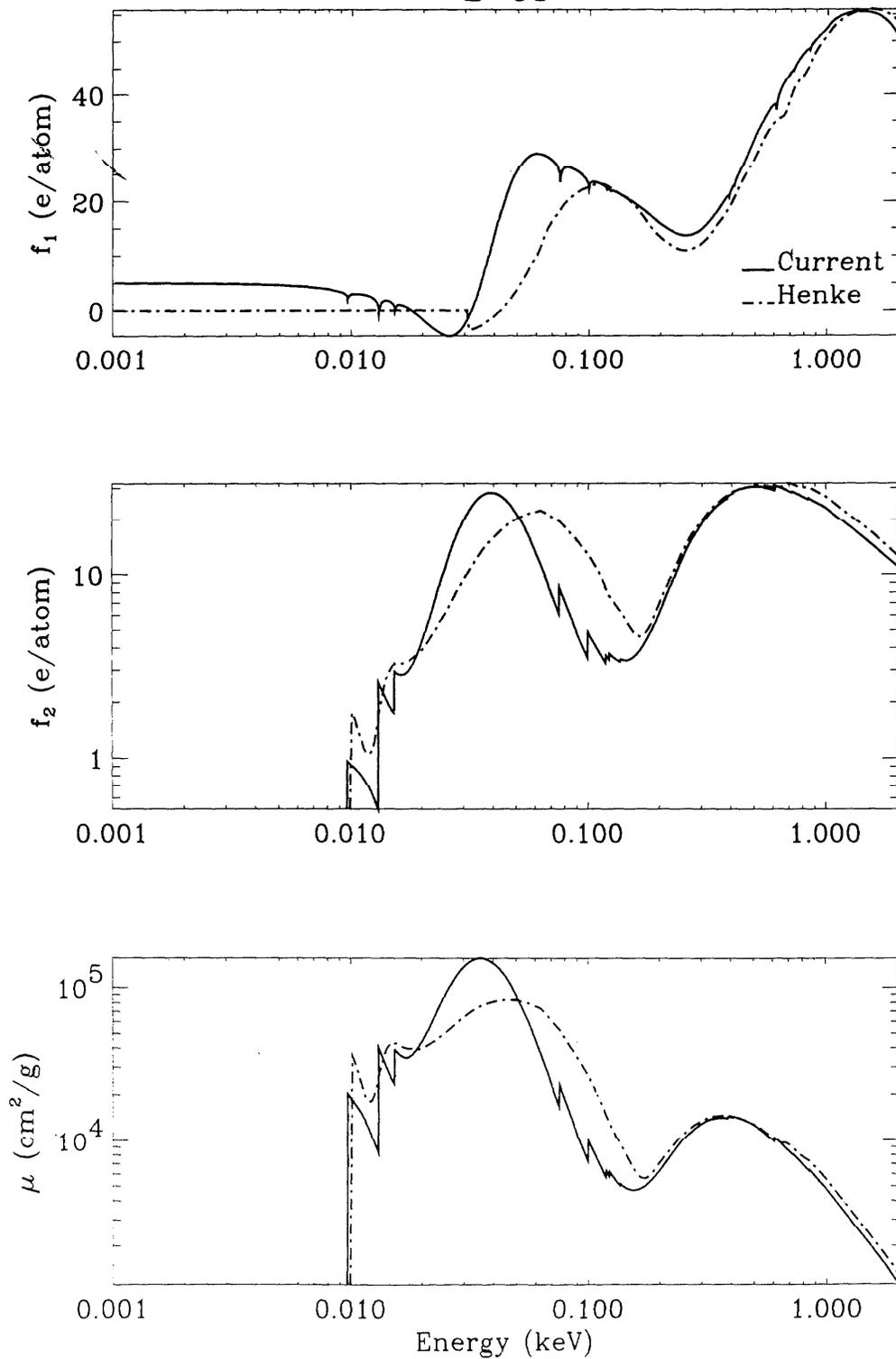
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

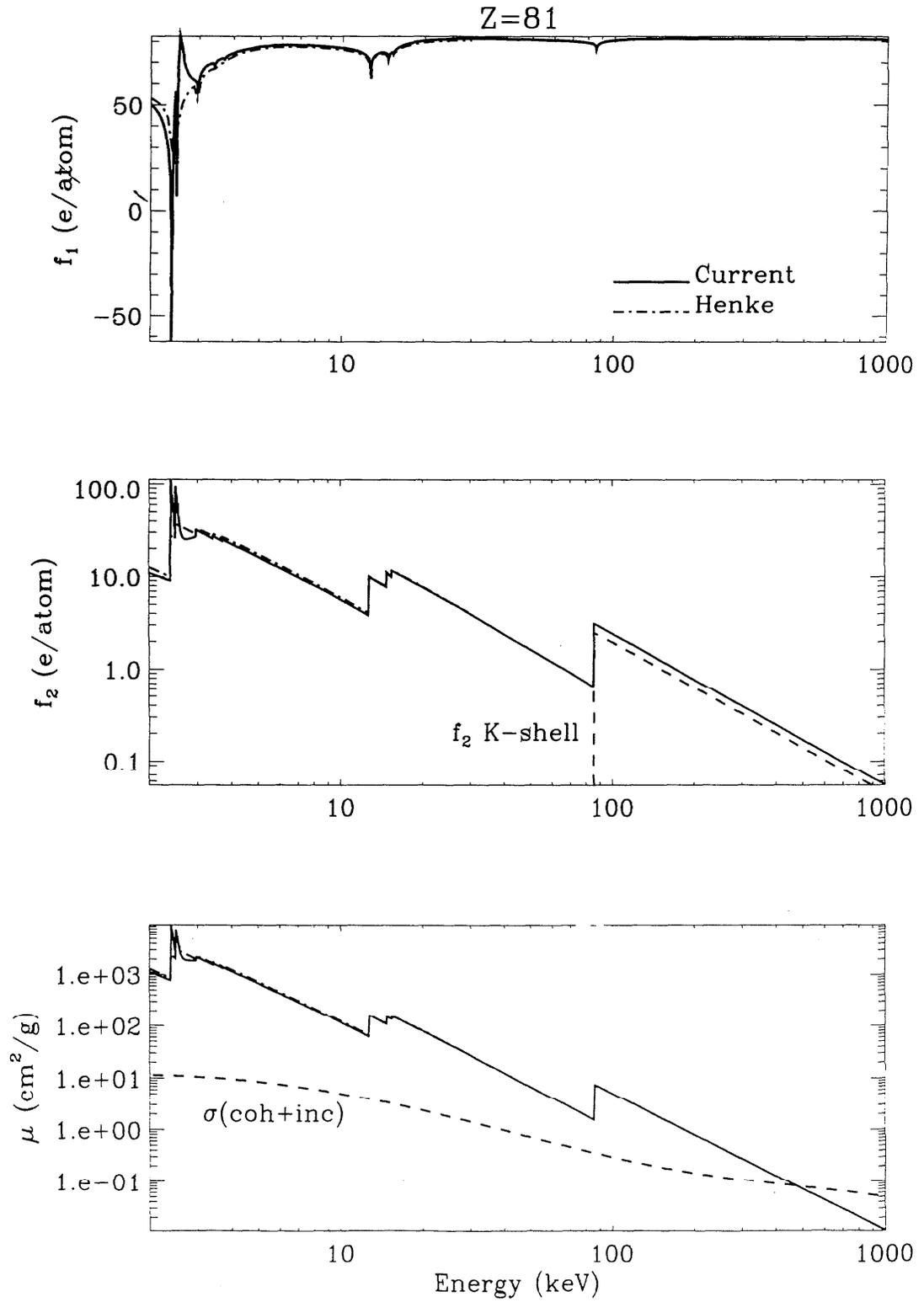
E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.334821E+00	7.57633E+01	2.0129E+01	9.5606E+02	9.1856E+00	0.000E+00	2.860E-01
4.633924E+00	7.65627E+01	1.8336E+01	8.1469E+02	8.8683E+00	0.000E+00	2.676E-01
4.953664E+00	7.73507E+01	1.6646E+01	6.9187E+02	8.5413E+00	0.000E+00	2.503E-01
5.295467E+00	7.78560E+01	1.5026E+01	5.8422E+02	8.2068E+00	0.000E+00	2.341E-01
5.660855E+00	7.80563E+01	1.3581E+01	4.9396E+02	7.8668E+00	0.000E+00	2.190E-01
6.051453E+00	7.82469E+01	1.2280E+01	4.1780E+02	7.5235E+00	0.000E+00	2.049E-01
6.469004E+00	7.82433E+01	1.1095E+01	3.5311E+02	7.1787E+00	0.000E+00	1.917E-01
6.915365E+00	7.82066E+01	1.0039E+01	2.9890E+02	6.8344E+00	0.000E+00	1.793E-01
7.392525E+00	7.80743E+01	9.0857E+00	2.5305E+02	6.4922E+00	0.000E+00	1.677E-01
7.902609E+00	7.79069E+01	8.2210E+00	2.1418E+02	6.1537E+00	0.000E+00	1.569E-01
8.447890E+00	7.76747E+01	7.4479E+00	1.8152E+02	5.8204E+00	0.000E+00	1.468E-01
9.030794E+00	7.74289E+01	6.7354E+00	1.5356E+02	5.4937E+00	0.000E+00	1.373E-01
9.653919E+00	7.70484E+01	6.0270E+00	1.2854E+02	5.1745E+00	0.000E+00	1.284E-01
1.032004E+01	7.65139E+01	5.4011E+00	1.0777E+02	4.8641E+00	0.000E+00	1.201E-01
1.103212E+01	7.57526E+01	4.8327E+00	9.0191E+01	4.5633E+00	0.000E+00	1.124E-01
1.179334E+01	7.44692E+01	4.3245E+00	7.5498E+01	4.2729E+00	0.000E+00	1.051E-01
1.240435E+01	7.20647E+01	3.9797E+00	6.6055E+01	4.0602E+00	0.000E+00	9.995E-02
1.259421E+01	6.93694E+01	3.8824E+00	6.3468E+01	3.9975E+00	0.000E+00	9.845E-02
1.260708E+01	6.89254E+01	3.8759E+00	6.3299E+01	3.9933E+00	0.000E+00	9.834E-02
1.264484E+01	6.62102E+01	3.8571E+00	6.2803E+01	3.9811E+00	0.000E+00	9.805E-02
1.272079E+01	6.93552E+01	9.9955E+00	1.6178E+02	3.9566E+00	0.000E+00	9.747E-02
1.291065E+01	7.21315E+01	9.7442E+00	1.5539E+02	3.8964E+00	0.000E+00	9.603E-02
1.347697E+01	7.42423E+01	9.0459E+00	1.3820E+02	3.7253E+00	0.000E+00	9.200E-02
1.440688E+01	7.42598E+01	8.0525E+00	1.1508E+02	3.4690E+00	0.000E+00	8.606E-02
1.462441E+01	7.30572E+01	7.8450E+00	1.1045E+02	3.4130E+00	0.000E+00	8.478E-02
1.468320E+01	7.14892E+01	7.7903E+00	1.0924E+02	3.3982E+00	0.000E+00	8.444E-02
1.477139E+01	7.31078E+01	1.0832E+01	1.5098E+02	3.3761E+00	0.000E+00	8.394E-02
1.499186E+01	7.45137E+01	1.0563E+01	1.4507E+02	3.3218E+00	0.000E+00	8.270E-02
1.503977E+01	7.46421E+01	1.0506E+01	1.4382E+02	3.3102E+00	0.000E+00	8.244E-02
1.526997E+01	7.46766E+01	1.0239E+01	1.3805E+02	3.2553E+00	0.000E+00	8.119E-02
1.533135E+01	7.40146E+01	1.0169E+01	1.3657E+02	3.2409E+00	0.000E+00	8.087E-02
1.540095E+01	7.48024E+01	1.1689E+01	1.5627E+02	3.2247E+00	0.000E+00	8.050E-02
1.542343E+01	7.50298E+01	1.1663E+01	1.5569E+02	3.2195E+00	0.000E+00	8.039E-02
1.565363E+01	7.61906E+01	1.1400E+01	1.4994E+02	3.1670E+00	0.000E+00	7.920E-02
1.646362E+01	7.79302E+01	1.0543E+01	1.3185E+02	2.9926E+00	0.000E+00	7.531E-02
1.759961E+01	7.91574E+01	9.4813E+00	1.1092E+02	2.7727E+00	0.000E+00	7.045E-02
1.881398E+01	7.99149E+01	8.5258E+00	9.3302E+01	2.5650E+00	0.000E+00	6.590E-02
2.011215E+01	8.04206E+01	7.6618E+00	7.8435E+01	2.3693E+00	0.000E+00	6.165E-02
2.149988E+01	8.07590E+01	6.8829E+00	6.5913E+01	2.1854E+00	0.000E+00	5.767E-02
2.298338E+01	8.09858E+01	6.1862E+00	5.5417E+01	2.0131E+00	0.000E+00	5.395E-02
2.456923E+01	8.11377E+01	5.5631E+00	4.6619E+01	1.8521E+00	0.000E+00	5.046E-02
2.626450E+01	8.13026E+01	5.0021E+00	3.9212E+01	1.7019E+00	0.000E+00	4.721E-02
2.807676E+01	8.13663E+01	4.4664E+00	3.2753E+01	1.5622E+00	0.000E+00	4.416E-02
3.001405E+01	8.14085E+01	3.9805E+00	2.7305E+01	1.4325E+00	0.000E+00	4.131E-02
3.208502E+01	8.14083E+01	3.5398E+00	2.2715E+01	1.3125E+00	0.000E+00	3.864E-02
3.429889E+01	8.13527E+01	3.1474E+00	1.8893E+01	1.2016E+00	0.000E+00	3.615E-02
3.666551E+01	8.12794E+01	2.8006E+00	1.5726E+01	1.0993E+00	0.000E+00	3.381E-02
3.919543E+01	8.11946E+01	2.4940E+00	1.3101E+01	1.0053E+00	0.000E+00	3.163E-02
4.189992E+01	8.11020E+01	2.2227E+00	1.0922E+01	9.1889E-01	0.000E+00	2.959E-02
4.479101E+01	8.10040E+01	1.9825E+00	9.1128E+00	8.3973E-01	0.000E+00	2.768E-02
4.788159E+01	8.09015E+01	1.7695E+00	7.6090E+00	7.6733E-01	0.000E+00	2.589E-02
5.118542E+01	8.07947E+01	1.5807E+00	6.3582E+00	7.0122E-01	0.000E+00	2.422E-02
5.471721E+01	8.06827E+01	1.4129E+00	5.3166E+00	6.4095E-01	0.000E+00	2.266E-02
5.849270E+01	8.05618E+01	1.2610E+00	4.4386E+00	5.8611E-01	0.000E+00	2.120E-02
6.252870E+01	8.04267E+01	1.1264E+00	3.7088E+00	5.3627E-01	0.000E+00	1.983E-02
6.684318E+01	8.02686E+01	1.0051E+00	3.0960E+00	4.9105E-01	0.000E+00	1.855E-02
7.145536E+01	8.00661E+01	8.9427E-01	2.5767E+00	4.5007E-01	0.000E+00	1.735E-02
7.638578E+01	7.97690E+01	7.9602E-01	2.1456E+00	4.1298E-01	0.000E+00	1.623E-02
8.165640E+01	7.91784E+01	7.0702E-01	1.7827E+00	3.7944E-01	0.000E+00	1.518E-02
8.738198E+01	7.85868E+01	6.7349E-01	1.6543E+00	3.6719E-01	0.000E+00	1.479E-02
8.510275E+01	7.75370E+01	6.5478E-01	1.5841E+00	3.6030E-01	0.000E+00	1.457E-02
8.544487E+01	7.62807E+01	6.4993E-01	1.5661E+00	3.5851E-01	0.000E+00	1.451E-02
8.595806E+01	7.75904E+01	3.1153E+00	7.4619E+00	3.5585E-01	5.922E+00	1.442E-02
8.729069E+01	7.87601E+01	3.0417E+00	7.1742E+00	3.4914E-01	5.701E+00	1.420E-02
9.331374E+01	8.00246E+01	2.7389E+00	6.0431E+00	3.2179E-01	4.824E+00	1.329E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
9.975239E+01	8.05126E+01	2.4627E+00	5.0830E+00	2.9712E-01	4.074E+00	1.243E-02
1.066353E+02	8.07956E+01	2.2109E+00	4.2687E+00	2.7487E-01	3.433E+00	1.163E-02
1.139931E+02	8.09776E+01	1.9839E+00	3.5833E+00	2.5481E-01	2.891E+00	1.088E-02
1.218587E+02	8.11005E+01	1.7796E+00	3.0067E+00	2.3672E-01	2.432E+00	1.017E-02
1.302669E+02	8.11831E+01	1.5932E+00	2.5181E+00	2.2041E-01	2.041E+00	9.518E-03
1.392553E+02	8.12370E+01	1.4262E+00	2.1086E+00	2.0569E-01	1.713E+00	8.903E-03
1.488640E+02	8.12709E+01	1.2766E+00	1.7656E+00	1.9240E-01	1.437E+00	8.329E-03
1.591356E+02	8.12905E+01	1.1428E+00	1.4785E+00	1.8038E-01	1.205E+00	7.791E-03
1.701159E+02	8.12998E+01	1.0231E+00	1.2382E+00	1.6951E-01	1.011E+00	7.288E-03
1.818539E+02	8.13018E+01	9.1573E-01	1.0368E+00	1.5964E-01	8.473E-01	6.818E-03
1.944018E+02	8.12980E+01	8.1924E-01	8.6765E-01	1.5067E-01	7.098E-01	6.378E-03
2.078156E+02	8.12900E+01	7.3300E-01	7.2621E-01	1.4251E-01	5.947E-01	5.966E-03
2.221548E+02	8.12792E+01	6.5591E-01	6.0788E-01	1.3505E-01	4.982E-01	5.581E-03
2.374835E+02	8.12665E+01	5.8698E-01	5.0889E-01	1.2822E-01	4.174E-01	5.221E-03
2.538699E+02	8.12527E+01	5.2535E-01	4.2606E-01	1.2194E-01	3.496E-01	4.884E-03
2.713869E+02	8.12382E+01	4.7023E-01	3.5674E-01	1.1615E-01	2.929E-01	4.569E-03
2.901126E+02	8.12234E+01	4.2093E-01	2.9873E-01	1.1079E-01	2.454E-01	4.274E-03
3.101304E+02	8.12087E+01	3.7684E-01	2.5018E-01	1.0581E-01	2.056E-01	3.998E-03
3.315294E+02	8.11943E+01	3.3739E-01	2.0953E-01	1.0117E-01	1.722E-01	3.740E-03
3.544049E+02	8.11803E+01	3.0210E-01	1.7550E-01	9.6827E-02	1.443E-01	3.498E-03
3.788588E+02	8.11668E+01	2.7052E-01	1.4701E-01	9.2742E-02	1.209E-01	3.273E-03
4.050001E+02	8.11540E+01	2.4226E-01	1.2316E-01	8.8889E-02	1.013E-01	3.061E-03
4.329451E+02	8.11418E+01	2.1697E-01	1.0318E-01	8.5241E-02	8.484E-02	2.864E-03

Z=81





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 567

Pb Z = 82

Atomic weight = 2.072000E+02 g/mol, nominal density ρ (g/cm³) = 1.1330E+01

μ_a (barns/atom) = μ (cm²/g) \times 3.44064E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.03090E+05

23 edges. Edge energies (keV):

K		8.80045E+00	L	I	1.58608E+00	L	II	1.52000E+00	L	III	1.30352E+01
M	K	3.85070E+00	M	II	3.55420E+00	M	III	3.06640E+00	M	IV	2.58560E+00
M	V	2.48400E+00	N	I	8.93600E-00	N	II	7.63900E-00	N	III	6.44500E-01
N	IV	4.33200E-00	N	V	4.12900E-00	O	I	1.42900E-00	N	VI	1.38100E-01
N	VII	1.47300E-00	O	II	1.04800E-00	O	III	8.60000E-02	O	IV	2.18000E-02
O	V	1.92000E-02	P	I	1.16904E-02	P	II	4.91166E-03			

Relativistic correction estimate f_{rel} (H82,3/5CL) = -1.9001E+00, -1.1136E+00 e/atom

Nuclear Thomson correction f_{NT} = -1.7802E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
4.813430E-03	3.38841E+00	0.0000E+00	0.0000E+00	3.9317E-06	0.000E+00	2.576E+02
4.887105E-03	2.16509E+00	0.0000E+00	0.0000E+00	4.2792E-06	0.000E+00	2.537E+02
4.906751E-03	7.08129E-01	0.0000E+00	0.0000E+00	4.3757E-06	0.000E+00	2.527E+02
4.936221E-03	2.21405E+00	2.8636E+00	1.1782E+05	4.5238E-06	0.000E+00	2.512E+02
5.009896E-03	3.52849E+00	2.8173E+00	1.1421E+05	4.9111E-06	0.000E+00	2.475E+02
1.069000E-02	6.12159E+00	1.3573E+00	2.5787E+04	2.3074E-04	0.000E+00	1.160E+02
1.142761E-02	5.67907E+00	1.2692E+00	2.2557E+04	3.1352E-04	0.000E+00	1.085E+02
1.145657E-02	5.64148E+00	1.2659E+00	2.2441E+04	3.1716E-04	0.000E+00	1.082E+02
1.163193E-02	5.19902E+00	1.2463E+00	2.1759E+04	3.3983E-04	0.000E+00	1.066E+02
1.167869E-02	4.68408E+00	1.2411E+00	2.1582E+04	3.4607E-04	0.000E+00	1.062E+02
1.174883E-02	5.21287E+00	2.2376E+00	3.8679E+04	3.5558E-04	0.000E+00	1.055E+02
1.192419E-02	5.66050E+00	2.1885E+00	3.7273E+04	3.8019E-04	0.000E+00	1.040E+02
1.221612E-02	5.90044E+00	2.1105E+00	3.5086E+04	4.2384E-04	0.000E+00	1.015E+02
1.305903E-02	6.07869E+00	1.9076E+00	2.9667E+04	5.7008E-04	0.000E+00	9.494E+01
1.396010E-02	6.02655E+00	1.7018E+00	2.4757E+04	7.6292E-04	0.000E+00	8.881E+01
1.492335E-02	5.81490E+00	1.4986E+00	2.0394E+04	1.0159E-03	0.000E+00	8.308E+01
1.595306E-02	5.45014E+00	1.3107E+00	1.6685E+04	1.3460E-03	0.000E+00	7.772E+01
1.705382E-02	4.89700E+00	1.1436E+00	1.3619E+04	1.7746E-03	0.000E+00	7.270E+01
1.823053E-02	4.02014E+00	9.9837E-01	1.1122E+04	2.3281E-03	0.000E+00	6.801E+01
1.881600E-02	3.29032E+00	9.3683E-01	1.0112E+04	2.6431E-03	0.000E+00	6.589E+01
1.910400E-02	2.51533E+00	9.0880E-01	9.6613E+03	2.8082E-03	0.000E+00	6.490E+01
1.918080E-02	1.79146E+00	9.0157E-01	9.5460E+03	2.8534E-03	0.000E+00	6.464E+01
1.929600E-02	2.34505E+00	2.1978E+00	2.3132E+04	2.9221E-03	0.000E+00	6.425E+01
1.948844E-02	2.64261E+00	2.2270E+00	2.3207E+04	3.0393E-03	0.000E+00	6.362E+01
1.958400E-02	2.68664E+00	2.2421E+00	2.3251E+04	3.0987E-03	0.000E+00	6.331E+01
2.083314E-02	2.28932E+00	2.4791E+00	2.4168E+04	3.9486E-03	0.000E+00	5.951E+01
2.136400E-02	1.86513E+00	2.6027E+00	2.4742E+04	4.3527E-03	0.000E+00	5.803E+01
2.169100E-02	1.37937E+00	2.6896E+00	2.5182E+04	4.6149E-03	0.000E+00	5.716E+01
2.177820E-02	9.80532E-01	2.7143E+00	2.5312E+04	4.6865E-03	0.000E+00	5.693E+01
2.190900E-02	1.22209E+00	3.4302E+00	3.1797E+04	4.7954E-03	0.000E+00	5.659E+01
2.223600E-02	1.30011E+00	3.5893E+00	3.2783E+04	5.0749E-03	0.000E+00	5.576E+01
2.227063E-02	1.29420E+00	3.6069E+00	3.2892E+04	5.1051E-03	0.000E+00	5.567E+01
2.380730E-02	6.54426E-01	4.5357E+00	3.8692E+04	6.5687E-03	0.000E+00	5.208E+01
2.545001E-02	-1.46130E-01	5.8566E+00	4.6736E+04	8.4115E-03	0.000E+00	4.872E+01
2.720606E-02	-8.49767E-01	7.6272E+00	5.6937E+04	1.0720E-02	0.000E+00	4.557E+01
2.908327E-02	-1.26341E+00	9.8580E+00	6.8839E+04	1.3598E-02	0.000E+00	4.263E+01
3.109002E-02	-1.18520E+00	1.2488E+01	8.1576E+04	1.7169E-02	0.000E+00	3.988E+01
3.323523E-02	-4.30245E-01	1.5367E+01	9.3901E+04	2.1575E-02	0.000E+00	3.731E+01
3.552846E-02	1.12440E+00	1.8258E+01	1.0437E+05	2.6988E-02	0.000E+00	3.490E+01
3.797993E-02	3.49835E+00	2.0870E+01	1.1160E+05	3.3602E-02	0.000E+00	3.264E+01
4.060054E-02	6.58400E+00	2.2914E+01	1.1462E+05	4.1648E-02	0.000E+00	3.054E+01
4.340198E-02	1.01580E+01	2.4161E+01	1.1306E+05	5.1385E-02	0.000E+00	2.857E+01
4.639671E-02	1.39223E+01	2.4492E+01	1.0721E+05	6.3113E-02	0.000E+00	2.672E+01
4.959809E-02	1.75636E+01	2.3914E+01	9.7922E+04	7.7171E-02	0.000E+00	2.500E+01
5.302035E-02	2.08108E+01	2.2553E+01	8.6389E+04	9.3941E-02	0.000E+00	2.338E+01
5.667876E-02	2.34749E+01	2.0610E+01	7.3850E+04	1.1385E-01	0.000E+00	2.187E+01
6.058959E-02	2.54864E+01	1.8316E+01	6.1393E+04	1.3737E-01	0.000E+00	2.046E+01
6.477028E-02	2.67900E+01	1.5890E+01	4.9824E+04	1.6503E-01	0.000E+00	1.914E+01
6.923942E-02	2.74834E+01	1.3511E+01	3.9629E+04	1.9740E-01	0.000E+00	1.791E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
7.401695E-02	2.75980E+01	1.1304E+01	3.1017E+04	2.3510E-01	0.000E+00	1.675E+01
7.912411E-02	2.71926E+01	9.3444E+00	2.3985E+04	2.7881E-01	0.000E+00	1.567E+01
8.428000E-02	2.60022E+01	7.7509E+00	1.8677E+04	3.2633E-01	0.000E+00	1.471E+01
8.458368E-02	2.58519E+01	7.6677E+00	1.8411E+04	3.2923E-01	0.000E+00	1.466E+01
8.557000E-02	2.49747E+01	7.4054E+00	1.7576E+04	3.3874E-01	0.000E+00	1.449E+01
8.591400E-02	2.38305E+01	7.3165E+00	1.7295E+04	3.4208E-01	0.000E+00	1.443E+01
8.643000E-02	2.49774E+01	9.3836E+00	2.2049E+04	3.4712E-01	0.000E+00	1.435E+01
8.772000E-02	2.58943E+01	8.9716E+00	2.0771E+04	3.5985E-01	0.000E+00	1.413E+01
9.041995E-02	2.63161E+01	8.1838E+00	1.8381E+04	3.8714E-01	0.000E+00	1.371E+01
9.665893E-02	2.60953E+01	6.6942E+00	1.4065E+04	4.5333E-01	0.000E+00	1.283E+01
1.027040E-01	2.51822E+01	5.6160E+00	1.1105E+04	5.2140E-01	0.000E+00	1.207E+01
1.033284E-01	2.49953E+01	5.5211E+00	1.0852E+04	5.2864E-01	0.000E+00	1.200E+01
1.042760E-01	2.45098E+01	5.3820E+00	1.0482E+04	5.3969E-01	0.000E+00	1.189E+01
1.046952E-01	2.38244E+01	5.3224E+00	1.0325E+04	5.4461E-01	0.000E+00	1.184E+01
1.053240E-01	2.44499E+01	6.5140E+00	1.2561E+04	5.5202E-01	0.000E+00	1.177E+01
1.068960E-01	2.49052E+01	6.2743E+00	1.1921E+04	5.7071E-01	0.000E+00	1.160E+01
1.104581E-01	2.50147E+01	5.7855E+00	1.0637E+04	6.1390E-01	0.000E+00	1.122E+01
1.180797E-01	2.46519E+01	4.9423E+00	8.5005E+03	7.1000E-01	0.000E+00	1.050E+01
1.262272E-01	2.40125E+01	4.2469E+00	6.8330E+03	8.1780E-01	0.000E+00	9.822E+00
1.349368E-01	2.30915E+01	3.6741E+00	5.5298E+03	9.3816E-01	0.000E+00	9.188E+00
1.353380E-01	2.30368E+01	3.6512E+00	5.4791E+03	9.4382E-01	0.000E+00	9.161E+00
1.374095E-01	2.26752E+01	3.5374E+00	5.2283E+03	9.7320E-01	0.000E+00	9.023E+00
1.379619E-01	2.24527E+01	3.5082E+00	5.1644E+03	9.8108E-01	0.000E+00	8.987E+00
1.387905E-01	2.25043E+01	3.7780E+00	5.5282E+03	9.9293E-01	0.000E+00	8.933E+00
1.400420E-01	2.24463E+01	3.7306E+00	5.4101E+03	1.0109E+00	0.000E+00	8.853E+00
1.408620E-01	2.23694E+01	3.7011E+00	5.3361E+03	1.0227E+00	0.000E+00	8.802E+00
1.421855E-01	2.21897E+01	3.6561E+00	5.2222E+03	1.0419E+00	0.000E+00	8.720E+00
1.427571E-01	2.20244E+01	3.6377E+00	5.1751E+03	1.0502E+00	0.000E+00	8.685E+00
1.436145E-01	2.20538E+01	3.8378E+00	5.4272E+03	1.0627E+00	0.000E+00	8.633E+00
1.442475E-01	2.20363E+01	3.8247E+00	5.3850E+03	1.0719E+00	0.000E+00	8.595E+00
1.443540E-01	2.20310E+01	3.8226E+00	5.3780E+03	1.0735E+00	0.000E+00	8.589E+00
1.457580E-01	2.19311E+01	3.7968E+00	5.2902E+03	1.0941E+00	0.000E+00	8.506E+00
1.465635E-01	2.18494E+01	3.7837E+00	5.2430E+03	1.1059E+00	0.000E+00	8.459E+00
1.471527E-01	2.17475E+01	3.7750E+00	5.2100E+03	1.1146E+00	0.000E+00	8.426E+00
1.480365E-01	2.17399E+01	3.8797E+00	5.3225E+03	1.1277E+00	0.000E+00	8.375E+00
1.502460E-01	2.16148E+01	3.8586E+00	5.2158E+03	1.1605E+00	0.000E+00	8.252E+00
1.542005E-01	2.13110E+01	3.8140E+00	5.0628E+03	1.2199E+00	0.000E+00	8.040E+00
1.648404E-01	2.03907E+01	3.9496E+00	4.8660E+03	1.3828E+00	0.000E+00	7.521E+00
1.762144E-01	1.93663E+01	4.2868E+00	4.9407E+03	1.5613E+00	0.000E+00	7.036E+00
1.883732E-01	1.82872E+01	4.8926E+00	5.2748E+03	1.7559E+00	0.000E+00	6.582E+00
2.013709E-01	1.72039E+01	5.8050E+00	5.8545E+03	1.9673E+00	0.000E+00	6.157E+00
2.152655E-01	1.61834E+01	7.0547E+00	6.6557E+03	2.1956E+00	0.000E+00	5.760E+00
2.301188E-01	1.53101E+01	8.6547E+00	7.6382E+03	2.4410E+00	0.000E+00	5.388E+00
2.459970E-01	1.46794E+01	1.0591E+01	8.7436E+03	2.7037E+00	0.000E+00	5.040E+00
2.629708E-01	1.43928E+01	1.2815E+01	9.8968E+03	2.9834E+00	0.000E+00	4.715E+00
2.811158E-01	1.45214E+01	1.5243E+01	1.1012E+04	3.2798E+00	0.000E+00	4.410E+00
3.005128E-01	1.51233E+01	1.7763E+01	1.2005E+04	3.5924E+00	0.000E+00	4.126E+00
3.212482E-01	1.62088E+01	2.0243E+01	1.2797E+04	3.9203E+00	0.000E+00	3.859E+00
3.434143E-01	1.77399E+01	2.2547E+01	1.3334E+04	4.2627E+00	0.000E+00	3.610E+00
3.671099E-01	1.96145E+01	2.4557E+01	1.3585E+04	4.6183E+00	0.000E+00	3.377E+00
3.924405E-01	2.16247E+01	2.6183E+01	1.3550E+04	4.9856E+00	0.000E+00	3.159E+00
4.046420E-01	2.24077E+01	2.6778E+01	1.3440E+04	5.1577E+00	0.000E+00	3.064E+00
4.108355E-01	2.25013E+01	2.7036E+01	1.3365E+04	5.2438E+00	0.000E+00	3.018E+00
4.124871E-01	2.21556E+01	2.7101E+01	1.3343E+04	5.2667E+00	0.000E+00	3.006E+00
4.149643E-01	2.27816E+01	2.8126E+01	1.3765E+04	5.3008E+00	0.000E+00	2.988E+00
4.195189E-01	2.34580E+01	2.8328E+01	1.3714E+04	5.3632E+00	0.000E+00	2.955E+00
4.211580E-01	2.36418E+01	2.8398E+01	1.3694E+04	5.3855E+00	0.000E+00	2.944E+00
4.264960E-01	2.41533E+01	2.8613E+01	1.3625E+04	5.4579E+00	0.000E+00	2.907E+00
4.330240E-01	2.45440E+01	2.8852E+01	1.3532E+04	5.5455E+00	0.000E+00	2.863E+00
4.347648E-01	2.43947E+01	2.8912E+01	1.3506E+04	5.5687E+00	0.000E+00	2.852E+00
4.373760E-01	2.49579E+01	2.9630E+01	1.3758E+04	5.6034E+00	0.000E+00	2.835E+00
4.439040E-01	2.58547E+01	2.9868E+01	1.3665E+04	5.6894E+00	0.000E+00	2.793E+00
4.484657E-01	2.63693E+01	3.0021E+01	1.3595E+04	5.7490E+00	0.000E+00	2.765E+00
4.794098E-01	2.94526E+01	3.0808E+01	1.3051E+04	6.1412E+00	0.000E+00	2.586E+00
5.124891E-01	3.24085E+01	3.1175E+01	1.2354E+04	6.5374E+00	0.000E+00	2.419E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 569

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
5.478508E-01	3.52053E+01	3.1135E+01	1.1542E+04	6.9354E+00	0.000E+00	2.263E+00
5.856525E-01	3.77253E+01	3.0732E+01	1.0657E+04	7.3326E+00	0.000E+00	2.117E+00
6.260625E-01	3.96148E+01	3.0024E+01	9.7394E+03	7.7265E+00	0.000E+00	1.980E+00
6.316100E-01	3.97238E+01	2.9913E+01	9.6183E+03	7.7782E+00	0.000E+00	1.963E+00
6.412775E-01	3.94487E+01	2.9715E+01	9.4107E+03	7.8669E+00	0.000E+00	1.933E+00
6.438555E-01	3.86459E+01	2.9662E+01	9.3562E+03	7.8903E+00	0.000E+00	1.926E+00
6.477225E-01	3.97906E+01	3.1420E+01	9.8515E+03	7.9251E+00	0.000E+00	1.914E+00
6.573900E-01	4.11016E+01	3.1224E+01	9.6461E+03	8.0111E+00	0.000E+00	1.886E+00
6.692609E-01	4.20758E+01	3.0980E+01	9.4011E+03	8.1144E+00	0.000E+00	1.853E+00
7.154399E-01	4.47919E+01	2.9968E+01	8.5069E+03	8.4935E+00	0.000E+00	1.733E+00
7.486220E-01	4.62243E+01	2.9142E+01	7.9057E+03	8.7448E+00	0.000E+00	1.656E+00
7.600805E-01	4.65277E+01	2.8844E+01	7.7069E+03	8.8277E+00	0.000E+00	1.631E+00
7.631361E-01	4.64459E+01	2.8764E+01	7.6549E+03	8.8495E+00	0.000E+00	1.625E+00
7.648052E-01	4.65329E+01	2.9119E+01	7.7325E+03	8.8613E+00	0.000E+00	1.621E+00
7.671195E-01	4.68286E+01	2.9045E+01	7.6836E+03	8.8818E+00	0.000E+00	1.615E+00
7.791780E-01	4.74363E+01	2.8757E+01	7.4953E+03	8.9615E+00	0.000E+00	1.591E+00
8.175768E-01	4.88792E+01	2.7813E+01	6.9088E+03	9.2149E+00	0.000E+00	1.516E+00
8.739896E-01	5.04050E+01	2.6517E+01	6.1618E+03	9.5518E+00	0.000E+00	1.419E+00
8.757280E-01	5.04378E+01	2.6479E+01	6.1407E+03	9.5616E+00	0.000E+00	1.416E+00
8.891320E-01	5.05671E+01	2.6190E+01	5.9822E+03	9.6355E+00	0.000E+00	1.394E+00
8.927064E-01	5.03855E+01	2.6114E+01	5.9410E+03	9.6549E+00	0.000E+00	1.389E+00
8.980680E-01	5.08049E+01	2.6544E+01	6.0026E+03	9.6837E+00	0.000E+00	1.381E+00
9.114720E-01	5.13939E+01	2.6270E+01	5.8533E+03	9.7541E+00	0.000E+00	1.360E+00
9.342948E-01	5.21187E+01	2.5821E+01	5.6127E+03	9.8695E+00	0.000E+00	1.327E+00
9.987612E-01	5.40284E+01	2.4668E+01	5.0161E+03	1.0165E+01	0.000E+00	1.241E+00
1.067676E+00	5.51916E+01	2.2837E+01	4.3440E+03	1.0438E+01	0.000E+00	1.161E+00
1.141345E+00	5.59312E+01	2.1159E+01	3.7651E+03	1.0684E+01	0.000E+00	1.086E+00
1.220098E+00	5.63969E+01	1.9642E+01	3.2695E+03	1.0902E+01	0.000E+00	1.016E+00
1.304285E+00	5.66806E+01	1.8274E+01	2.8455E+03	1.1091E+01	0.000E+00	9.506E-01
1.394281E+00	5.67656E+01	1.7027E+01	2.4802E+03	1.1249E+01	0.000E+00	8.892E-01
1.490486E+00	5.66654E+01	1.5901E+01	2.1667E+03	1.1376E+01	0.000E+00	8.318E-01
1.593329E+00	5.63856E+01	1.4877E+01	1.8962E+03	1.1470E+01	0.000E+00	7.781E-01
1.703269E+00	5.58874E+01	1.3885E+01	1.6556E+03	1.1531E+01	0.000E+00	7.279E-01
1.820795E+00	5.50115E+01	1.2864E+01	1.4349E+03	1.1558E+01	0.000E+00	6.809E-01
1.946430E+00	5.35497E+01	1.1912E+01	1.2429E+03	1.1553E+01	0.000E+00	6.370E-01
2.080733E+00	5.11302E+01	1.1047E+01	1.0782E+03	1.1515E+01	0.000E+00	5.959E-01
2.224304E+00	4.66544E+01	1.0260E+01	9.3678E+02	1.1445E+01	0.000E+00	5.574E-01
2.377781E+00	3.47678E+01	9.5437E+00	8.1514E+02	1.1343E+01	0.000E+00	5.214E-01
2.434320E+00	2.15013E+01	9.3069E+00	7.7646E+02	1.1301E+01	0.000E+00	5.093E-01
2.471580E+00	-1.04844E+01	9.1579E+00	7.5251E+02	1.1271E+01	0.000E+00	5.016E-01
2.481516E+00	-5.91205E+01	9.1190E+00	7.4631E+02	1.1263E+01	0.000E+00	4.996E-01
2.496420E+00	1.62019E+01	1.0431E+02	8.4861E+03	1.1251E+01	0.000E+00	4.966E-01
2.533888E+00	5.70647E+01	5.9929E+01	4.8033E+03	1.1219E+01	0.000E+00	4.893E-01
2.541848E+00	5.71970E+01	5.3615E+01	4.2838E+03	1.1212E+01	0.000E+00	4.878E-01
2.572672E+00	4.03685E+01	3.5762E+01	2.8231E+03	1.1185E+01	0.000E+00	4.819E-01
2.583014E+00	7.46043E+00	3.1547E+01	2.4804E+03	1.1176E+01	0.000E+00	4.800E-01
2.598528E+00	5.62406E+01	8.9856E+01	7.0227E+03	1.1162E+01	0.000E+00	4.771E-01
2.637312E+00	8.11759E+01	5.5870E+01	4.3024E+03	1.1127E+01	0.000E+00	4.701E-01
2.717235E+00	7.40074E+01	2.9363E+01	2.1947E+03	1.1052E+01	0.000E+00	4.563E-01
2.904724E+00	6.37849E+01	2.7733E+01	1.9390E+03	1.0866E+01	0.000E+00	4.268E-01
3.005072E+00	6.36068E+01	2.8533E+01	1.9283E+03	1.0761E+01	0.000E+00	4.126E-01
3.051068E+00	6.24888E+01	2.8245E+01	1.8801E+03	1.0712E+01	0.000E+00	4.064E-01
3.063334E+00	6.02965E+01	2.8135E+01	1.8652E+03	1.0699E+01	0.000E+00	4.047E-01
3.081732E+00	6.31211E+01	3.2728E+01	2.1568E+03	1.0679E+01	0.000E+00	4.023E-01
3.105150E+00	6.50320E+01	3.2371E+01	2.1172E+03	1.0654E+01	0.000E+00	3.993E-01
3.127728E+00	6.61640E+01	3.1990E+01	2.0772E+03	1.0629E+01	0.000E+00	3.964E-01
3.319406E+00	7.02717E+01	2.8398E+01	1.7374E+03	1.0419E+01	0.000E+00	3.735E-01
3.483116E+00	7.10983E+01	2.6116E+01	1.5227E+03	1.0236E+01	0.000E+00	3.560E-01
3.536429E+00	7.07077E+01	2.5488E+01	1.4637E+03	1.0176E+01	0.000E+00	3.506E-01
3.548445E+00	7.01540E+01	2.5351E+01	1.4509E+03	1.0162E+01	0.000E+00	3.494E-01
3.550646E+00	6.98960E+01	2.5326E+01	1.4486E+03	1.0160E+01	0.000E+00	3.492E-01
3.571971E+00	7.09424E+01	2.6856E+01	1.5270E+03	1.0136E+01	0.000E+00	3.471E-01
3.625284E+00	7.20451E+01	2.6213E+01	1.4685E+03	1.0076E+01	0.000E+00	3.420E-01
3.773686E+00	7.31347E+01	2.4593E+01	1.3235E+03	9.9091E+00	0.000E+00	3.285E-01
3.793288E+00	7.31748E+01	2.4401E+01	1.3064E+03	9.8871E+00	0.000E+00	3.269E-01

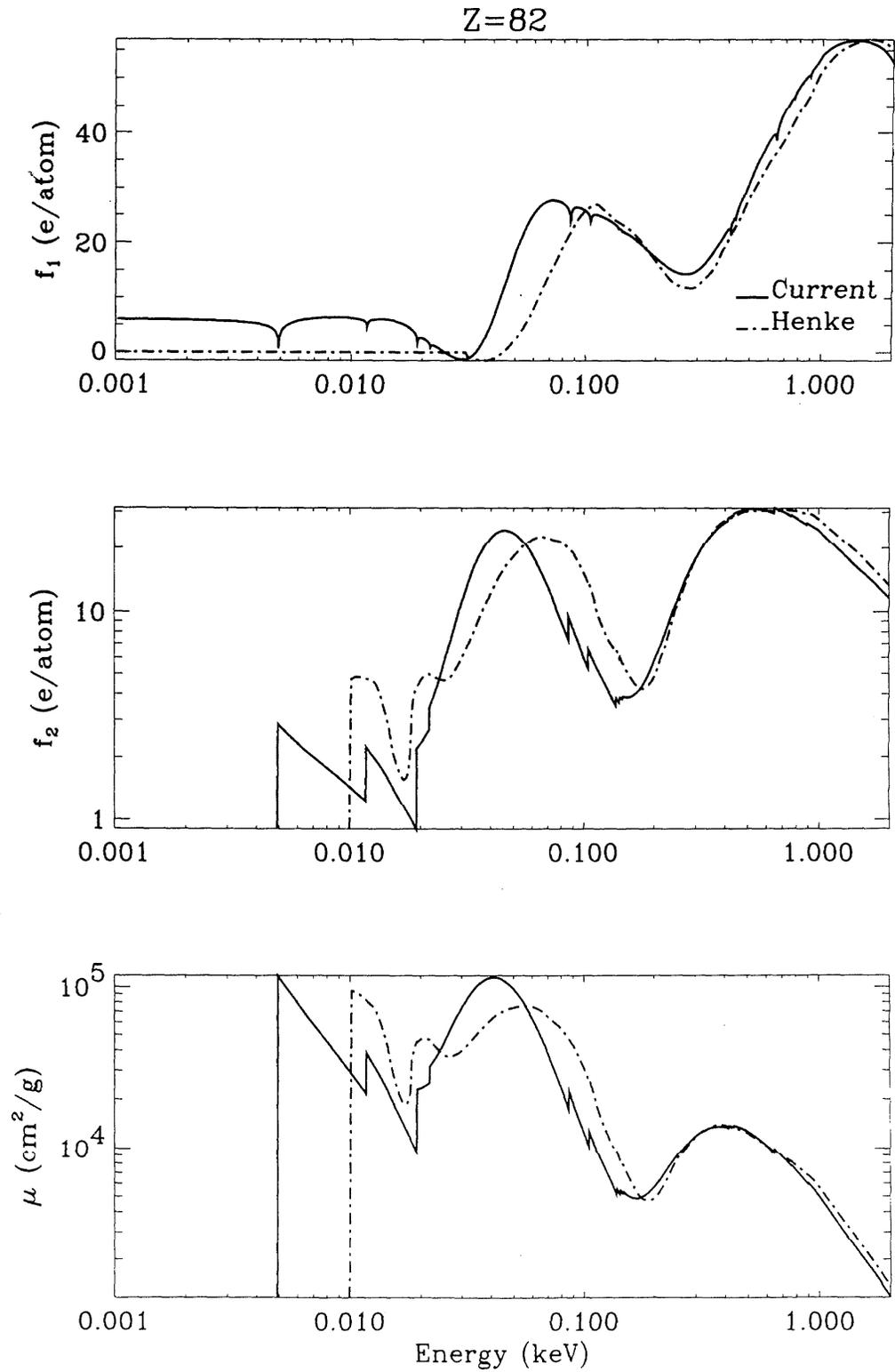
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

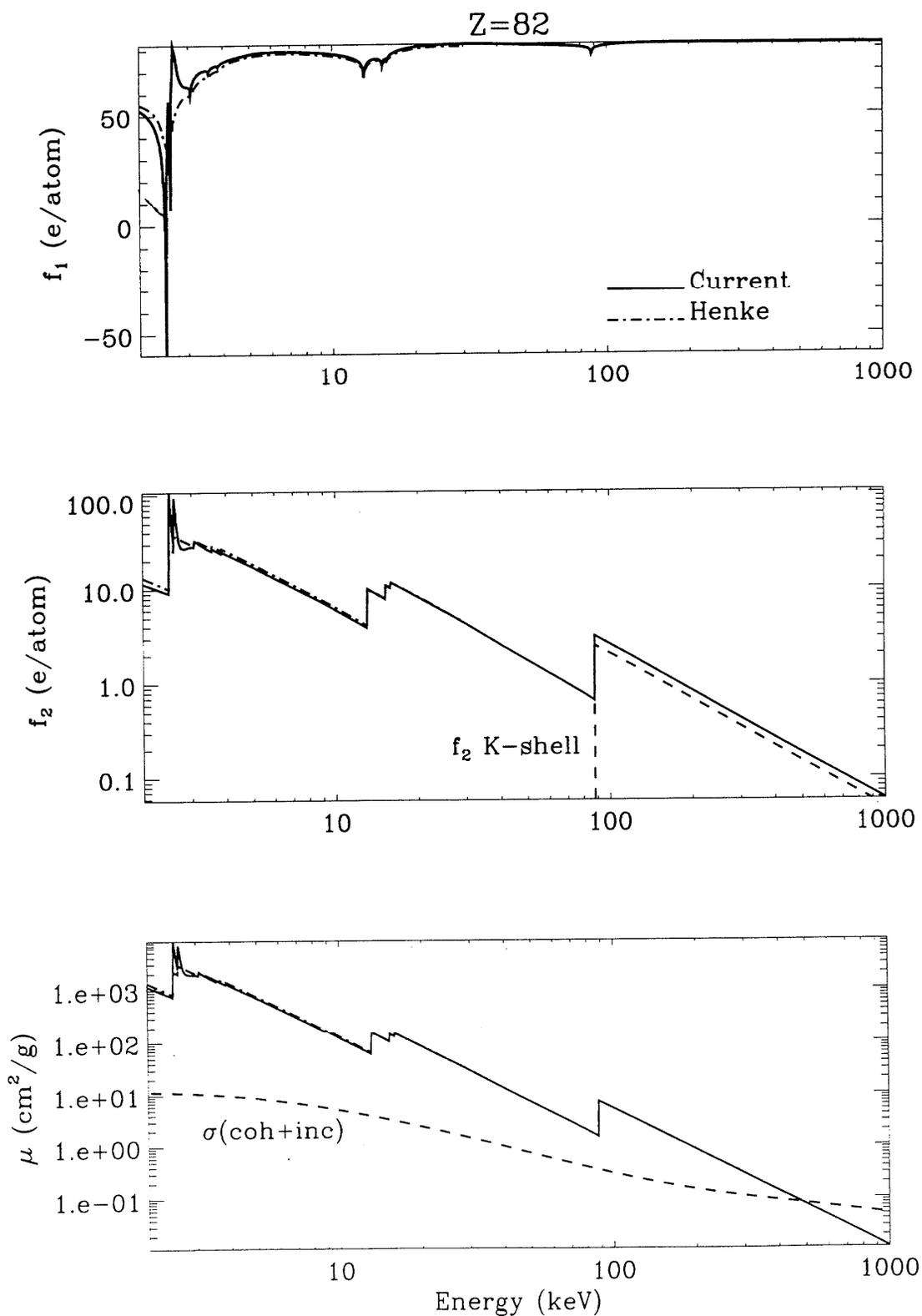
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
3.831446E+00	7.30610E+01	2.4038E+01	1.2742E+03	9.8443E+00	0.000E+00	3.236E-01
3.846849E+00	7.26158E+01	2.3895E+01	1.2615E+03	9.8270E+00	0.000E+00	3.223E-01
3.869953E+00	7.32920E+01	2.4742E+01	1.2984E+03	9.8012E+00	0.000E+00	3.204E-01
3.927714E+00	7.40871E+01	2.4229E+01	1.2528E+03	9.7366E+00	0.000E+00	3.157E-01
4.055024E+00	7.50448E+01	2.3157E+01	1.1598E+03	9.5949E+00	0.000E+00	3.058E-01
4.334821E+00	7.63426E+01	2.1077E+01	9.8746E+02	9.2881E+00	0.000E+00	2.860E-01
4.633924E+00	7.72630E+01	1.9216E+01	8.4219E+02	8.9690E+00	0.000E+00	2.676E-01
4.953664E+00	7.79592E+01	1.7490E+01	7.1707E+02	8.6398E+00	0.000E+00	2.503E-01
5.295467E+00	7.87656E+01	1.5810E+01	6.0636E+02	8.3027E+00	0.000E+00	2.341E-01
5.660855E+00	7.90397E+01	1.4268E+01	5.1187E+02	7.9600E+00	0.000E+00	2.190E-01
6.051453E+00	7.91701E+01	1.2895E+01	4.3275E+02	7.6136E+00	0.000E+00	2.049E-01
6.469004E+00	7.92972E+01	1.1651E+01	3.6577E+02	7.2655E+00	0.000E+00	1.917E-01
6.915365E+00	7.92468E+01	1.0540E+01	3.0955E+02	6.9177E+00	0.000E+00	1.793E-01
7.392525E+00	7.91802E+01	9.5449E+00	2.6222E+02	6.5719E+00	0.000E+00	1.677E-01
7.902609E+00	7.90416E+01	8.6478E+00	2.224E+02	6.2297E+00	0.000E+00	1.569E-01
8.447890E+00	7.88433E+01	7.8357E+00	1.8837E+02	5.8926E+00	0.000E+00	1.468E-01
9.030794E+00	7.86366E+01	7.0842E+00	1.5931E+02	5.5620E+00	0.000E+00	1.373E-01
9.653919E+00	7.82954E+01	6.3370E+00	1.3331E+02	5.2391E+00	0.000E+00	1.284E-01
1.032004E+01	7.78206E+01	5.6779E+00	1.1174E+02	4.9249E+00	0.000E+00	1.201E-01
1.103212E+01	7.71762E+01	5.0898E+00	9.3698E+01	4.6203E+00	0.000E+00	1.124E-01
1.179334E+01	7.61947E+01	4.5557E+00	7.8453E+01	4.3262E+00	0.000E+00	1.051E-01
1.260708E+01	7.40992E+01	4.0822E+00	6.5761E+01	4.0431E+00	0.000E+00	9.834E-02
1.277450E+01	7.31416E+01	3.9953E+00	6.3517E+01	3.9884E+00	0.000E+00	9.706E-02
1.297002E+01	7.04638E+01	3.8979E+00	6.1034E+01	3.9261E+00	0.000E+00	9.559E-02
1.302216E+01	6.73245E+01	3.8726E+00	6.0396E+01	3.9097E+00	0.000E+00	9.521E-02
1.310038E+01	7.04488E+01	9.9729E+00	1.5461E+02	3.8854E+00	0.000E+00	9.464E-02
1.329590E+01	7.32095E+01	9.7275E+00	1.4858E+02	3.8256E+00	0.000E+00	9.325E-02
1.347697E+01	7.42235E+01	9.5058E+00	1.4325E+02	3.7715E+00	0.000E+00	9.200E-02
1.440688E+01	7.57933E+01	8.4714E+00	1.1942E+02	3.5118E+00	0.000E+00	8.606E-02
1.489600E+01	7.53700E+01	7.9928E+00	1.0897E+02	3.3864E+00	0.000E+00	8.323E-02
1.512400E+01	7.41555E+01	7.7840E+00	1.0453E+02	3.3304E+00	0.000E+00	8.198E-02
1.518480E+01	7.25905E+01	7.7297E+00	1.0338E+02	3.3157E+00	0.000E+00	8.165E-02
1.527600E+01	7.42010E+01	1.0761E+01	1.4307E+02	3.2939E+00	0.000E+00	8.116E-02
1.540095E+01	7.51978E+01	1.0613E+01	1.3996E+02	3.2643E+00	0.000E+00	8.050E-02
1.550400E+01	7.55924E+01	1.0493E+01	1.3745E+02	3.2402E+00	0.000E+00	7.997E-02
1.554358E+01	7.56951E+01	1.0447E+01	1.3651E+02	3.2311E+00	0.000E+00	7.977E-02
1.578150E+01	7.57392E+01	1.0180E+01	1.3100E+02	3.1768E+00	0.000E+00	7.856E-02
1.584494E+01	7.50825E+01	1.0110E+01	1.2958E+02	3.1626E+00	0.000E+00	7.825E-02
1.594010E+01	7.60919E+01	1.1594E+01	1.4771E+02	3.1415E+00	0.000E+00	7.778E-02
1.617802E+01	7.72456E+01	1.1331E+01	1.4224E+02	3.0896E+00	0.000E+00	7.664E-02
1.646362E+01	7.80037E+01	1.1029E+01	1.3605E+02	3.0291E+00	0.000E+00	7.531E-02
1.759961E+01	7.96648E+01	9.9294E+00	1.1458E+02	2.8063E+00	0.000E+00	7.045E-02
1.881398E+01	8.05990E+01	8.9312E+00	9.6409E+01	2.5957E+00	0.000E+00	6.590E-02
2.011215E+01	8.12072E+01	8.0330E+00	8.1116E+01	2.3974E+00	0.000E+00	6.165E-02
2.149988E+01	8.16163E+01	7.2192E+00	6.8193E+01	2.2110E+00	0.000E+00	5.767E-02
2.298338E+01	8.18914E+01	6.4893E+00	5.7342E+01	2.0364E+00	0.000E+00	5.395E-02
2.456923E+01	8.20773E+01	5.8363E+00	4.8243E+01	1.8732E+00	0.000E+00	5.046E-02
2.626450E+01	8.22675E+01	5.2514E+00	4.0607E+01	1.7210E+00	0.000E+00	4.721E-02
2.807676E+01	8.23534E+01	4.6894E+00	3.3920E+01	1.5794E+00	0.000E+00	4.416E-02
3.001405E+01	8.23744E+01	4.1819E+00	2.8297E+01	1.4480E+00	0.000E+00	4.131E-02
3.208502E+01	8.24220E+01	3.7254E+00	2.3581E+01	1.3263E+00	0.000E+00	3.864E-02
3.429889E+01	8.23775E+01	3.3123E+00	1.9613E+01	1.2140E+00	0.000E+00	3.615E-02
3.666551E+01	8.23113E+01	2.9473E+00	1.6325E+01	1.1104E+00	0.000E+00	3.381E-02
3.919543E+01	8.22314E+01	2.6246E+00	1.3600E+01	1.0151E+00	0.000E+00	3.163E-02
4.189992E+01	8.21424E+01	2.3390E+00	1.1337E+01	9.2757E-01	0.000E+00	2.959E-02
4.479101E+01	8.20471E+01	2.0861E+00	9.4586E+00	8.4740E-01	0.000E+00	2.768E-02
4.788159E+01	8.19471E+01	1.8619E+00	7.8974E+00	7.7408E-01	0.000E+00	2.589E-02
5.118542E+01	8.18428E+01	1.6631E+00	6.5988E+00	7.0714E-01	0.000E+00	2.422E-02
5.471721E+01	8.17338E+01	1.4866E+00	5.5177E+00	6.4614E-01	0.000E+00	2.266E-02
5.849270E+01	8.16181E+01	1.3280E+00	4.6109E+00	5.9063E-01	0.000E+00	2.120E-02
6.252870E+01	8.14905E+01	1.1860E+00	3.8521E+00	5.4020E-01	0.000E+00	1.983E-02
6.684318E+01	8.13447E+01	1.0596E+00	3.2195E+00	4.9445E-01	0.000E+00	1.855E-02
7.145536E+01	8.11664E+01	9.4428E-01	2.6838E+00	4.5300E-01	0.000E+00	1.735E-02
7.638578E+01	8.09221E+01	8.4086E-01	2.2356E+00	4.1549E-01	0.000E+00	1.623E-02
8.165640E+01	8.05139E+01	7.4709E-01	1.8581E+00	3.8158E-01	0.000E+00	1.518E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 571

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
8.624441E+01	7.96017E+01	6.7514E-01	1.5898E+00	3.5627E-01	0.000E+00	1.438E-02
8.729069E+01	7.89273E+01	6.6026E-01	1.5362E+00	3.5096E-01	0.000E+00	1.420E-02
8.756448E+01	7.85581E+01	6.5646E-01	1.5225E+00	3.4960E-01	0.000E+00	1.416E-02
8.791650E+01	7.73094E+01	6.5162E-01	1.5053E+00	3.4787E-01	0.000E+00	1.410E-02
8.844452E+01	7.86113E+01	3.1021E+00	7.1232E+00	3.4530E-01	5.643E+00	1.402E-02
8.976459E+01	7.97499E+01	3.0313E+00	6.8582E+00	3.3904E-01	5.439E+00	1.381E-02
9.331374E+01	8.06837E+01	2.8524E+00	6.2080E+00	3.2333E-01	4.937E+00	1.329E-02
9.975239E+01	8.13428E+01	2.5665E+00	5.2253E+00	2.9841E-01	4.173E+00	1.243E-02
1.066353E+02	8.16907E+01	2.3054E+00	4.3907E+00	2.7595E-01	3.519E+00	1.163E-02
1.139931E+02	8.19070E+01	2.0695E+00	3.6871E+00	2.5571E-01	2.964E+00	1.088E-02
1.218587E+02	8.20504E+01	1.8573E+00	3.0954E+00	2.3746E-01	2.496E+00	1.017E-02
1.302669E+02	8.21481E+01	1.6646E+00	2.5951E+00	2.2101E-01	2.097E+00	9.518E-03
1.392553E+02	8.22125E+01	1.4907E+00	2.1741E+00	2.0618E-01	1.761E+00	8.903E-03
1.488640E+02	8.22539E+01	1.3349E+00	1.8212E+00	1.9279E-01	1.478E+00	8.329E-03
1.591356E+02	8.22790E+01	1.1954E+00	1.5256E+00	1.8069E-01	1.240E+00	7.791E-03
1.701159E+02	8.22923E+01	1.0706E+00	1.2781E+00	1.6974E-01	1.040E+00	7.288E-03
1.818539E+02	8.22972E+01	9.5890E-01	1.0709E+00	1.5982E-01	8.728E-01	6.818E-03
1.944018E+02	8.22958E+01	8.5844E-01	8.9680E-01	1.5081E-01	7.317E-01	6.378E-03
2.078156E+02	8.22896E+01	7.6852E-01	7.5105E-01	1.4260E-01	6.134E-01	5.966E-03
2.221548E+02	8.22802E+01	6.8810E-01	6.2905E-01	1.3511E-01	5.142E-01	5.581E-03
2.374835E+02	8.22685E+01	6.1616E-01	5.2693E-01	1.2826E-01	4.311E-01	5.221E-03
2.538699E+02	8.22554E+01	5.5180E-01	4.4143E-01	1.2196E-01	3.614E-01	4.884E-03
2.713869E+02	8.22414E+01	4.9421E-01	3.6984E-01	1.1616E-01	3.030E-01	4.569E-03
2.901126E+02	8.22270E+01	4.4267E-01	3.0989E-01	1.1079E-01	2.540E-01	4.274E-03
3.101304E+02	8.22125E+01	3.9654E-01	2.5968E-01	1.0580E-01	2.129E-01	3.998E-03
3.315294E+02	8.21982E+01	3.5525E-01	2.1762E-01	1.0115E-01	1.785E-01	3.740E-03
3.544049E+02	8.21842E+01	3.1829E-01	1.8239E-01	9.6805E-02	1.496E-01	3.498E-03
3.788588E+02	8.21707E+01	2.8519E-01	1.5288E-01	9.2719E-02	1.254E-01	3.273E-03
4.050001E+02	8.21578E+01	2.5556E-01	1.2815E-01	8.8866E-02	1.052E-01	3.061E-03
4.329451E+02	8.21455E+01	2.2902E-01	1.0743E-01	8.5218E-02	8.816E-02	2.864E-03





Bi Z = 83

Atomic weight = 2.089804E+02 g/mol, nominal density ρ (g/cm³) = 9.7300E+00 μ_a (barns/atom) = μ (cm²/g) \times 3.47020E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.01360E+05

23 edges. Edge energies (keV):

K		9.05259E+00	L	I	1.63875E+00	L	II	1.57111E+00	L	III	1.34186E+01
M	I	3.99910E+00	M	II	3.69630E+00	M	III	3.17690E+00	M	IV	2.68760E+00
M	V	2.57960E+00	N	I	9.38200E-00	N	II	8.05300E-00	N	III	6.78900E-01
N	IV	4.63600E-00	N	V	4.40000E-00	N	VI	1.61900E-00	O	I	1.57400E-01
N	VII	1.59300E-00	O	II	1.16800E-00	O	III	9.28000E-02	O	IV	2.65000E-02
O	V	2.44000E-02	P	I	1.42334E-02	P	II	6.16991E-03			

Relativistic correction estimate f_{rel} (HR2,3/5CI) = -1.9618E+00, -1.1484E+00 e/atomNuclear Thomson correction f_{NT} = -1.8084E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
6.046510E-03	1.28464E+00	0.0000E+00	0.0000E+00	1.1814E-05	0.000E+00	2.051E+02
6.139059E-03	-1.80675E-01	0.0000E+00	0.0000E+00	1.2814E-05	0.000E+00	2.020E+02
6.163738E-03	-1.91459E+00	0.0000E+00	0.0000E+00	1.3092E-05	0.000E+00	2.012E+02
6.200758E-03	-1.37486E-01	3.4020E+00	1.1047E+05	1.3516E-05	0.000E+00	2.000E+02
6.293306E-03	1.40890E+00	3.3618E+00	1.0756E+05	1.4625E-05	0.000E+00	1.970E+02
1.069000E-02	4.97863E+00	2.2826E+00	4.2995E+04	2.0606E-04	0.000E+00	1.160E+02
1.142761E-02	4.97869E+00	2.1596E+00	3.8053E+04	2.8085E-04	0.000E+00	1.085E+02
1.221612E-02	4.91679E+00	2.0341E+00	3.3528E+04	3.8084E-04	0.000E+00	1.015E+02
1.305903E-02	4.76197E+00	1.9063E+00	2.9394E+04	5.1378E-04	0.000E+00	9.494E+01
1.396010E-02	4.32198E+00	1.7772E+00	2.5635E+04	6.8961E-04	0.000E+00	8.881E+01
1.416222E-02	3.93071E+00	1.7493E+00	2.4872E+04	7.3427E-04	0.000E+00	8.755E+01
1.421916E-02	3.46074E+00	1.7415E+00	2.4662E+04	7.4721E-04	0.000E+00	8.720E+01
1.430456E-02	3.94974E+00	2.6458E+00	3.7244E+04	7.6692E-04	0.000E+00	8.667E+01
1.451806E-02	4.35860E+00	2.5748E+00	3.5711E+04	8.1782E-04	0.000E+00	8.540E+01
1.492335E-02	4.57910E+00	2.4480E+00	3.3031E+04	9.2094E-04	0.000E+00	8.308E+01
1.595306E-02	4.63786E+00	2.1658E+00	2.7337E+04	1.2237E-03	0.000E+00	7.772E+01
1.705382E-02	4.45056E+00	1.9095E+00	2.2546E+04	1.6179E-03	0.000E+00	7.270E+01
1.823053E-02	4.09469E+00	1.6789E+00	1.8544E+04	2.1284E-03	0.000E+00	6.801E+01
1.948844E-02	3.57158E+00	1.4744E+00	1.5234E+04	2.7862E-03	0.000E+00	6.362E+01
2.083314E-02	2.85179E+00	1.2942E+00	1.2509E+04	3.6295E-03	0.000E+00	5.951E+01
2.227063E-02	1.84894E+00	1.1360E+00	1.0271E+04	4.7049E-03	0.000E+00	5.567E+01
2.380730E-02	2.79116E-01	9.9700E-01	8.4326E+03	6.0695E-03	0.000E+00	5.208E+01
2.391200E-02	1.27349E-01	9.8848E-01	8.3239E+03	6.1709E-03	0.000E+00	5.185E+01
2.427800E-02	-6.05839E-01	9.5954E-01	7.9584E+03	6.5344E-03	0.000E+00	5.107E+01
2.437560E-02	-1.10786E+00	9.5204E-01	7.8645E+03	6.6336E-03	0.000E+00	5.086E+01
2.452200E-02	-9.40591E-01	1.7065E+00	1.4012E+04	6.7843E-03	0.000E+00	5.056E+01
2.488800E-02	-1.08707E+00	1.8034E+00	1.4591E+04	7.1709E-03	0.000E+00	4.982E+01
2.545001E-02	-1.64041E+00	1.9899E+00	1.5744E+04	7.7921E-03	0.000E+00	4.872E+01
2.597000E-02	-2.28637E+00	2.2093E+00	1.7130E+04	8.3972E-03	0.000E+00	4.774E+01
2.636750E-02	-2.93846E+00	2.4120E+00	1.8420E+04	8.8797E-03	0.000E+00	4.702E+01
2.647350E-02	-3.27904E+00	2.4718E+00	1.8801E+04	9.0114E-03	0.000E+00	4.683E+01
2.663250E-02	-3.29644E+00	2.9799E+00	2.2530E+04	9.2112E-03	0.000E+00	4.655E+01
2.703000E-02	-3.63457E+00	3.3173E+00	2.4712E+04	9.7233E-03	0.000E+00	4.587E+01
2.720606E-02	-3.82014E+00	3.4805E+00	2.5760E+04	9.9558E-03	0.000E+00	4.557E+01
2.908327E-02	-5.89222E+00	5.7491E+00	3.9804E+04	1.2660E-02	0.000E+00	4.263E+01
3.109002E-02	-7.62257E+00	9.2212E+00	5.9723E+04	1.6022E-02	0.000E+00	3.988E+01
3.323523E-02	-8.35979E+00	1.3756E+01	8.3345E+04	2.0182E-02	0.000E+00	3.731E+01
3.552846E-02	-7.57550E+00	1.8920E+01	1.0723E+05	2.5304E-02	0.000E+00	3.490E+01
3.797993E-02	-5.00556E+00	2.4015E+01	1.2732E+05	3.1579E-02	0.000E+00	3.264E+01
4.060054E-02	-7.72435E-01	2.8271E+01	1.4021E+05	3.9228E-02	0.000E+00	3.054E+01
4.340198E-02	4.64125E+00	3.1078E+01	1.4419E+05	4.8507E-02	0.000E+00	2.857E+01
4.639671E-02	1.05467E+01	3.2139E+01	1.3948E+05	5.9707E-02	0.000E+00	2.672E+01
4.959809E-02	1.62480E+01	3.1504E+01	1.2790E+05	7.3162E-02	0.000E+00	2.500E+01
5.302035E-02	2.12033E+01	2.9491E+01	1.1200E+05	8.9247E-02	0.000E+00	2.338E+01
5.667876E-02	2.51009E+01	2.6556E+01	9.4344E+04	1.0838E-01	0.000E+00	2.187E+01
6.058959E-02	2.78531E+01	2.3160E+01	7.6968E+04	1.3104E-01	0.000E+00	2.046E+01
6.477028E-02	2.95388E+01	1.9688E+01	6.1207E+04	1.5773E-01	0.000E+00	1.914E+01
6.923942E-02	3.03295E+01	1.6411E+01	4.7726E+04	1.8903E-01	0.000E+00	1.791E+01
7.401695E-02	3.04572E+01	1.3486E+01	3.6688E+04	2.2556E-01	0.000E+00	1.675E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 575

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
7.912411E-02	3.00351E+01	1.0980E+01	2.7942E+04	2.6799E-01	0.000E+00	1.567E+01
8.458368E-02	2.92314E+01	8.8954E+00	2.1176E+04	3.1704E-01	0.000E+00	1.466E+01
9.041995E-02	2.78160E+01	7.1994E+00	1.6033E+04	3.7347E-01	0.000E+00	1.371E+01
9.094400E-02	2.76060E+01	7.0692E+00	1.5652E+04	3.7874E-01	0.000E+00	1.363E+01
9.233600E-02	2.66090E+01	6.7387E+00	1.4695E+04	3.9286E-01	0.000E+00	1.343E+01
9.270720E-02	2.55780E+01	6.6542E+00	1.4453E+04	3.9666E-01	0.000E+00	1.337E+01
9.326400E-02	2.65515E+01	8.4652E+00	1.8277E+04	4.0240E-01	0.000E+00	1.329E+01
9.465600E-02	2.72752E+01	8.0859E+00	1.7201E+04	4.1688E-01	0.000E+00	1.310E+01
9.665893E-02	2.74823E+01	7.5808E+00	1.5792E+04	4.3809E-01	0.000E+00	1.283E+01
1.033284E-01	2.71254E+01	6.1948E+00	1.2072E+04	5.1173E-01	0.000E+00	1.200E+01
1.104581E-01	2.62374E+01	5.1249E+00	9.3424E+03	5.9527E-01	0.000E+00	1.122E+01
1.144640E-01	2.54904E+01	4.6628E+00	8.2025E+03	6.4422E-01	0.000E+00	1.083E+01
1.162160E-01	2.47960E+01	4.4852E+00	7.7712E+03	6.6607E-01	0.000E+00	1.067E+01
1.166832E-01	2.41212E+01	4.4401E+00	7.6623E+03	6.7193E-01	0.000E+00	1.063E+01
1.173840E-01	2.47170E+01	5.6135E+00	9.6294E+03	6.8077E-01	0.000E+00	1.056E+01
1.180797E-01	2.49747E+01	5.5334E+00	9.4361E+03	6.8958E-01	0.000E+00	1.050E+01
1.191360E-01	2.51250E+01	5.4159E+00	9.1539E+03	7.0303E-01	0.000E+00	1.041E+01
1.262272E-01	2.50157E+01	4.7387E+00	7.5593E+03	7.9555E-01	0.000E+00	9.822E+00
1.349368E-01	2.44093E+01	4.1073E+00	6.1292E+03	9.1406E-01	0.000E+00	9.188E+00
1.442475E-01	2.35910E+01	3.5964E+00	5.0203E+03	1.0460E+00	0.000E+00	8.595E+00
1.542005E-01	2.24846E+01	3.1864E+00	4.1609E+03	1.1921E+00	0.000E+00	8.040E+00
1.542520E-01	2.24774E+01	3.1846E+00	4.1572E+03	1.1929E+00	0.000E+00	8.038E+00
1.561140E-01	2.21808E+01	3.1203E+00	4.0247E+03	1.2208E+00	0.000E+00	7.942E+00
1.566130E-01	2.20759E+01	3.1036E+00	3.9904E+03	1.2283E+00	0.000E+00	7.917E+00
1.572426E-01	2.18580E+01	3.0830E+00	3.9480E+03	1.2378E+00	0.000E+00	7.885E+00
1.581870E-01	2.18413E+01	3.3158E+00	4.2208E+03	1.2520E+00	0.000E+00	7.838E+00
1.586620E-01	2.17964E+01	3.3071E+00	4.1971E+03	1.2592E+00	0.000E+00	7.814E+00
1.591407E-01	2.17049E+01	3.2986E+00	4.1737E+03	1.2664E+00	0.000E+00	7.791E+00
1.600965E-01	2.16729E+01	3.4080E+00	4.2863E+03	1.2809E+00	0.000E+00	7.744E+00
1.605480E-01	2.16360E+01	3.4013E+00	4.2660E+03	1.2877E+00	0.000E+00	7.723E+00
1.610905E-01	2.15720E+01	3.3937E+00	4.2421E+03	1.2960E+00	0.000E+00	7.697E+00
1.617381E-01	2.14279E+01	3.3853E+00	4.2146E+03	1.3059E+00	0.000E+00	7.666E+00
1.624860E-01	2.14394E+01	3.5669E+00	4.4203E+03	1.3173E+00	0.000E+00	7.630E+00
1.627095E-01	2.14392E+01	3.5665E+00	4.4137E+03	1.3207E+00	0.000E+00	7.620E+00
1.648404E-01	2.13246E+01	3.5670E+00	4.3573E+03	1.3533E+00	0.000E+00	7.521E+00
1.651380E-01	2.13028E+01	3.5678E+00	4.3504E+03	1.3579E+00	0.000E+00	7.508E+00
1.762144E-01	2.03011E+01	3.7195E+00	4.2503E+03	1.5302E+00	0.000E+00	7.036E+00
1.883732E-01	1.91101E+01	4.1589E+00	4.4456E+03	1.7234E+00	0.000E+00	6.582E+00
2.013709E-01	1.78619E+01	4.9263E+00	4.9261E+03	1.9334E+00	0.000E+00	6.157E+00
2.152655E-01	1.66344E+01	6.0678E+00	5.6758E+03	2.1607E+00	0.000E+00	5.760E+00
2.301188E-01	1.55253E+01	7.6096E+00	6.6586E+03	2.4054E+00	0.000E+00	5.388E+00
2.459970E-01	1.46470E+01	9.5459E+00	7.8138E+03	2.6676E+00	0.000E+00	5.040E+00
2.629708E-01	1.41138E+01	1.1830E+01	9.0586E+03	2.9472E+00	0.000E+00	4.715E+00
2.811158E-01	1.40267E+01	1.4375E+01	1.0297E+04	3.2439E+00	0.000E+00	4.410E+00
3.005128E-01	1.44493E+01	1.7058E+01	1.1430E+04	3.5572E+00	0.000E+00	4.126E+00
3.212482E-01	1.54066E+01	1.9738E+01	1.2372E+04	3.8864E+00	0.000E+00	3.859E+00
3.434143E-01	1.68702E+01	2.2267E+01	1.3056E+04	4.2304E+00	0.000E+00	3.610E+00
3.671099E-01	1.87560E+01	2.4511E+01	1.3444E+04	4.5883E+00	0.000E+00	3.377E+00
3.924405E-01	2.09220E+01	2.6362E+01	1.3526E+04	4.9585E+00	0.000E+00	3.159E+00
4.195189E-01	2.30901E+01	2.7747E+01	1.3318E+04	5.3394E+00	0.000E+00	2.955E+00
4.312000E-01	2.37719E+01	2.8172E+01	1.3156E+04	5.4989E+00	0.000E+00	2.875E+00
4.378000E-01	2.37625E+01	2.8370E+01	1.3048E+04	5.5877E+00	0.000E+00	2.832E+00
4.395600E-01	2.32706E+01	2.8418E+01	1.3018E+04	5.6112E+00	0.000E+00	2.821E+00
4.422000E-01	2.40733E+01	2.9716E+01	1.3531E+04	5.6464E+00	0.000E+00	2.804E+00
4.484657E-01	2.50378E+01	2.9921E+01	1.3434E+04	5.7297E+00	0.000E+00	2.765E+00
4.488000E-01	2.50758E+01	2.9931E+01	1.3429E+04	5.7336E+00	0.000E+00	2.763E+00
4.543280E-01	2.56187E+01	3.0093E+01	1.3337E+04	5.8060E+00	0.000E+00	2.729E+00
4.612820E-01	2.60072E+01	3.0274E+01	1.3215E+04	5.8960E+00	0.000E+00	2.688E+00
4.631364E-01	2.57858E+01	3.0319E+01	1.3182E+04	5.9199E+00	0.000E+00	2.677E+00
4.659180E-01	2.64552E+01	3.1184E+01	1.3477E+04	5.9555E+00	0.000E+00	2.661E+00
4.728720E-01	2.74852E+01	3.1369E+01	1.3358E+04	6.0438E+00	0.000E+00	2.622E+00
4.794098E-01	2.82360E+01	3.1525E+01	1.3241E+04	6.1259E+00	0.000E+00	2.586E+00
5.124891E-01	3.15026E+01	3.2053E+01	1.2594E+04	6.5273E+00	0.000E+00	2.419E+00
5.478508E-01	3.45283E+01	3.2172E+01	1.1825E+04	6.9309E+00	0.000E+00	2.263E+00
5.856525E-01	3.73187E+01	3.1907E+01	1.0970E+04	7.3344E+00	0.000E+00	2.117E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.260625E-01	3.97560E+01	3.1325E+01	1.0075E+04	7.7349E+00	0.000E+00	1.980E+00
6.653220E-01	4.12563E+01	3.0575E+01	9.2537E+03	8.0953E+00	0.000E+00	1.864E+00
6.692609E-01	4.12625E+01	3.0493E+01	9.1744E+03	8.1299E+00	0.000E+00	1.853E+00
6.755055E-01	4.09626E+01	3.0360E+01	9.0500E+03	8.1843E+00	0.000E+00	1.835E+00
6.782211E-01	4.01316E+01	3.0302E+01	8.9964E+03	8.2078E+00	0.000E+00	1.828E+00
6.822945E-01	4.13099E+01	3.2111E+01	9.4767E+03	8.2427E+00	0.000E+00	1.817E+00
6.924780E-01	4.26536E+01	3.1895E+01	9.2744E+03	8.3288E+00	0.000E+00	1.790E+00
7.154399E-01	4.43295E+01	3.1398E+01	8.8370E+03	8.5166E+00	0.000E+00	1.733E+00
7.648052E-01	4.68915E+01	3.0271E+01	7.9697E+03	8.8923E+00	0.000E+00	1.621E+00
7.891940E-01	4.78527E+01	2.9669E+01	7.5699E+03	9.0644E+00	0.000E+00	1.571E+00
8.012735E-01	4.81600E+01	2.9358E+01	7.3776E+03	9.1465E+00	0.000E+00	1.547E+00
8.044947E-01	4.80771E+01	2.9275E+01	7.3273E+03	9.1680E+00	0.000E+00	1.541E+00
8.093265E-01	4.84646E+01	2.9556E+01	7.3535E+03	9.2001E+00	0.000E+00	1.532E+00
8.175768E-01	4.89088E+01	2.9350E+01	7.2285E+03	9.2541E+00	0.000E+00	1.516E+00
8.214060E-01	4.90796E+01	2.9255E+01	7.1715E+03	9.2788E+00	0.000E+00	1.509E+00
8.739896E-01	5.09056E+01	2.7990E+01	6.4488E+03	9.5993E+00	0.000E+00	1.419E+00
9.194360E-01	5.20323E+01	2.6977E+01	5.9080E+03	9.8490E+00	0.000E+00	1.348E+00
9.342948E-01	5.21610E+01	2.6663E+01	5.7464E+03	9.9255E+00	0.000E+00	1.327E+00
9.372618E-01	5.19936E+01	2.6601E+01	5.7149E+03	9.9404E+00	0.000E+00	1.323E+00
9.428910E-01	5.24160E+01	2.7026E+01	5.7715E+03	9.9686E+00	0.000E+00	1.315E+00
9.569640E-01	5.30146E+01	2.6745E+01	5.6276E+03	1.0038E+01	0.000E+00	1.296E+00
9.987612E-01	5.42915E+01	2.5959E+01	5.2337E+03	1.0230E+01	0.000E+00	1.241E+00
1.067676E+00	5.57658E+01	2.3982E+01	4.5230E+03	1.0511E+01	0.000E+00	1.161E+00
1.141345E+00	5.66852E+01	2.2193E+01	3.9154E+03	1.0765E+01	0.000E+00	1.086E+00
1.220098E+00	5.72860E+01	2.0563E+01	3.3936E+03	1.0992E+01	0.000E+00	1.016E+00
1.304285E+00	5.76408E+01	1.9095E+01	2.9480E+03	1.1189E+01	0.000E+00	9.506E-01
1.394281E+00	5.78244E+01	1.7769E+01	2.5662E+03	1.1355E+01	0.000E+00	8.892E-01
1.490486E+00	5.78064E+01	1.6564E+01	2.2377E+03	1.1489E+01	0.000E+00	8.318E-01
1.593329E+00	5.76088E+01	1.5475E+01	1.9556E+03	1.1589E+01	0.000E+00	7.781E-01
1.703269E+00	5.72133E+01	1.4483E+01	1.7122E+03	1.1657E+01	0.000E+00	7.279E-01
1.820795E+00	5.65660E+01	1.3519E+01	1.4951E+03	1.1690E+01	0.000E+00	6.809E-01
1.946430E+00	5.54761E+01	1.2527E+01	1.2959E+03	1.1690E+01	0.000E+00	6.370E-01
2.080733E+00	5.36738E+01	1.1606E+01	1.1231E+03	1.1656E+01	0.000E+00	5.959E-01
2.224304E+00	5.05885E+01	1.0770E+01	9.7495E+02	1.1590E+01	0.000E+00	5.574E-01
2.377781E+00	4.42806E+01	1.0008E+01	8.4750E+02	1.1492E+01	0.000E+00	5.214E-01
2.528008E+00	2.29257E+01	9.3687E+00	7.4623E+02	1.1374E+01	0.000E+00	4.904E-01
2.541848E+00	1.67324E+01	9.3143E+00	7.3786E+02	1.1363E+01	0.000E+00	4.878E-01
2.566702E+00	-8.26706E+00	9.2184E+00	7.2319E+02	1.1342E+01	0.000E+00	4.830E-01
2.577020E+00	-5.55387E+01	9.1793E+00	7.1724E+02	1.1333E+01	0.000E+00	4.811E-01
2.592498E+00	1.73968E+01	1.0173E+02	7.9014E+03	1.1319E+01	0.000E+00	4.782E-01
2.631192E+00	5.73359E+01	5.9103E+01	4.5230E+03	1.1284E+01	0.000E+00	4.712E-01
2.633848E+00	5.75963E+01	5.7041E+01	4.3608E+03	1.1282E+01	0.000E+00	4.707E-01
2.674162E+00	4.02718E+01	3.4444E+01	2.5936E+03	1.1245E+01	0.000E+00	4.636E-01
2.684912E+00	7.82514E+00	3.0484E+01	2.2862E+03	1.1235E+01	0.000E+00	4.618E-01
2.701038E+00	5.55292E+01	8.7989E+01	6.5595E+03	1.1220E+01	0.000E+00	4.590E-01
2.717235E+00	7.27322E+01	7.1938E+01	5.3309E+03	1.1205E+01	0.000E+00	4.563E-01
2.741352E+00	8.00429E+01	5.5463E+01	4.0739E+03	1.1182E+01	0.000E+00	4.523E-01
2.904724E+00	6.63686E+01	2.9219E+01	2.0255E+03	1.1019E+01	0.000E+00	4.268E-01
3.105150E+00	6.54673E+01	2.9921E+01	1.9403E+03	1.0807E+01	0.000E+00	3.993E-01
3.113362E+00	6.54604E+01	2.9875E+01	1.9322E+03	1.0799E+01	0.000E+00	3.982E-01
3.161015E+00	6.44773E+01	2.9452E+01	1.8761E+03	1.0747E+01	0.000E+00	3.922E-01
3.173723E+00	6.23221E+01	2.9293E+01	1.8585E+03	1.0733E+01	0.000E+00	3.907E-01
3.192784E+00	6.51817E+01	3.3794E+01	2.1313E+03	1.0712E+01	0.000E+00	3.883E-01
3.240438E+00	6.83072E+01	3.2848E+01	2.0411E+03	1.0660E+01	0.000E+00	3.826E-01
3.319406E+00	7.07145E+01	3.0981E+01	1.8793E+03	1.0572E+01	0.000E+00	3.735E-01
3.548445E+00	7.27368E+01	2.6688E+01	1.5144E+03	1.0315E+01	0.000E+00	3.494E-01
3.622374E+00	7.27982E+01	2.5811E+01	1.4348E+03	1.0231E+01	0.000E+00	3.423E-01
3.677819E+00	7.23340E+01	2.5191E+01	1.3792E+03	1.0168E+01	0.000E+00	3.371E-01
3.692604E+00	7.15008E+01	2.5031E+01	1.3650E+03	1.0152E+01	0.000E+00	3.358E-01
3.714782E+00	7.25342E+01	2.6575E+01	1.4405E+03	1.0126E+01	0.000E+00	3.338E-01
3.770226E+00	7.35950E+01	2.5931E+01	1.3849E+03	1.0064E+01	0.000E+00	3.289E-01
3.793288E+00	7.38401E+01	2.5671E+01	1.3627E+03	1.0038E+01	0.000E+00	3.269E-01
3.919118E+00	7.45558E+01	2.4360E+01	1.2516E+03	9.8957E+00	0.000E+00	3.164E-01
3.979104E+00	7.44575E+01	2.3807E+01	1.2047E+03	9.8283E+00	0.000E+00	3.116E-01
3.995101E+00	7.40108E+01	2.3664E+01	1.1927E+03	9.8103E+00	0.000E+00	3.103E-01

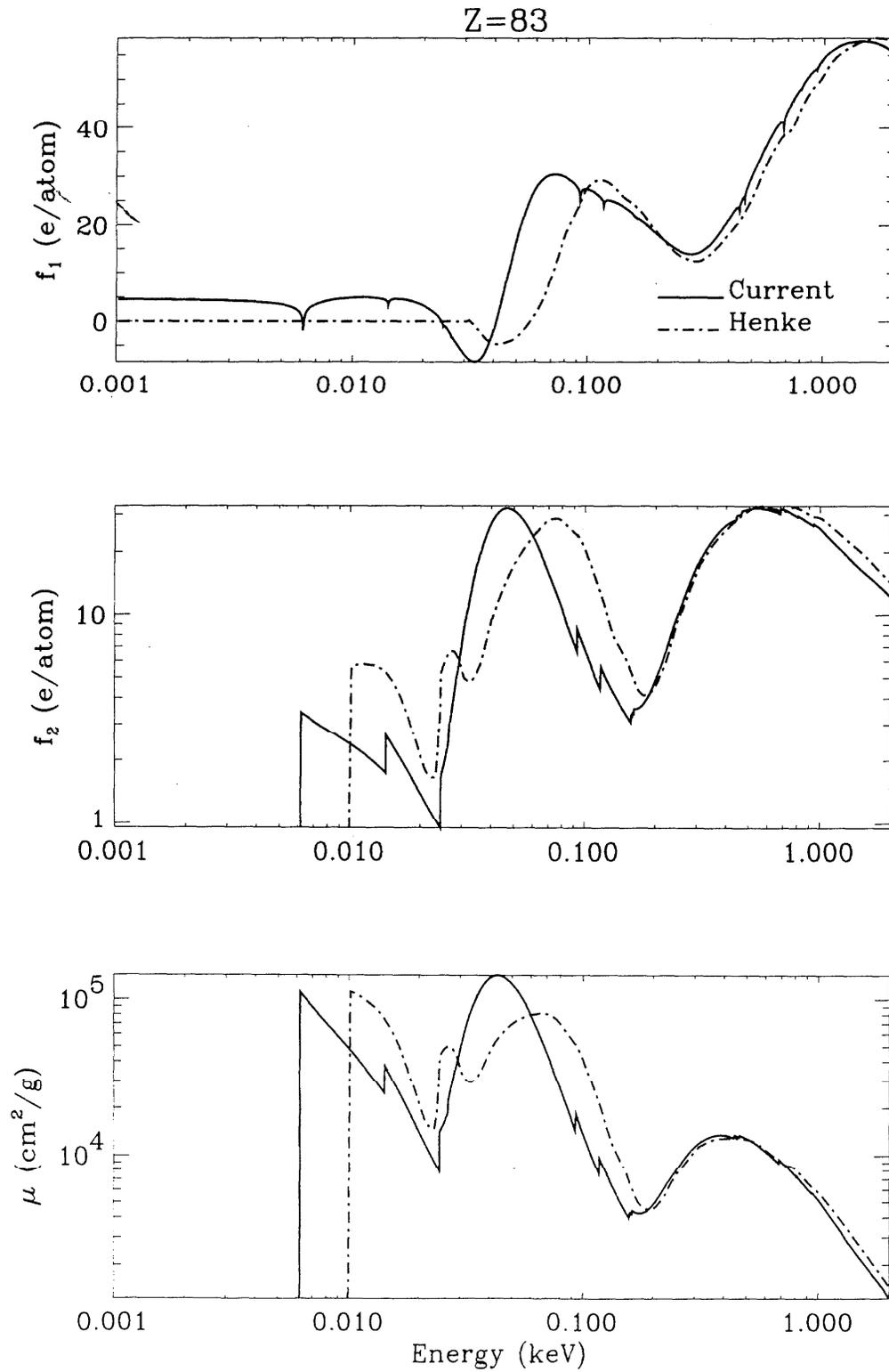
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 577

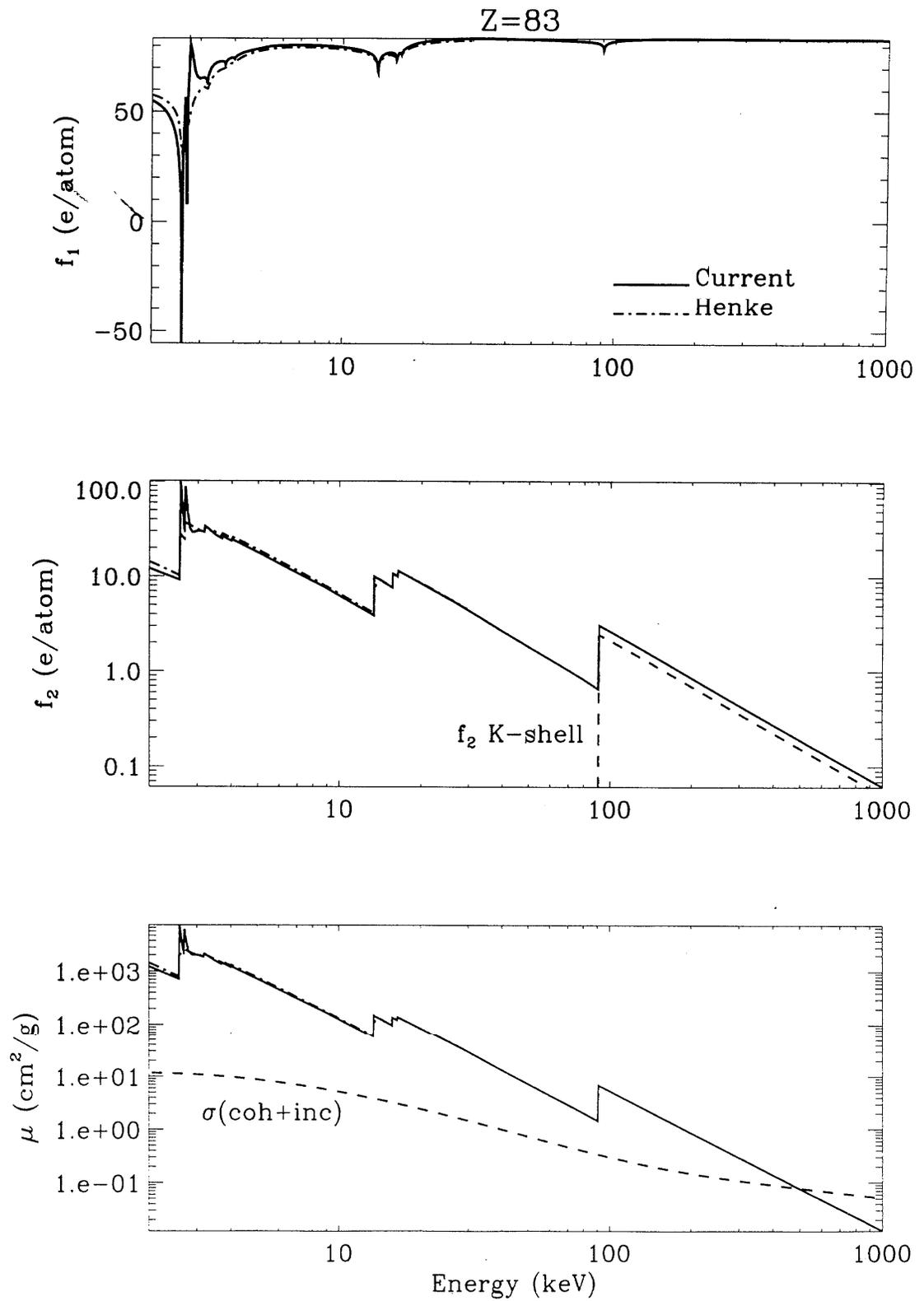
TABLE 1: Form factors, attenuation and scattering cross-sections. Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
4.019095E+00	7.46703E+01	2.4500E+01	1.2275E+03	9.7835E+00	0.000E+00	3.085E-01
4.055024E+00	7.51982E+01	2.4192E+01	1.2013E+03	9.7433E+00	0.000E+00	3.058E-01
4.079082E+00	7.54358E+01	2.3991E+01	1.1843E+03	9.7164E+00	0.000E+00	3.040E-01
4.334821E+00	7.69398E+01	2.2001E+01	1.0220E+03	9.4338E+00	0.000E+00	2.860E-01
4.633924E+00	7.79688E+01	2.0042E+01	8.7091E+02	9.1114E+00	0.000E+00	2.676E-01
4.953664E+00	7.87429E+01	1.8262E+01	7.4232E+02	8.7786E+00	0.000E+00	2.503E-01
5.295467E+00	7.94993E+01	1.6583E+01	6.3058E+02	8.4375E+00	0.000E+00	2.341E-01
5.660855E+00	7.99893E+01	1.4972E+01	5.3258E+02	8.0904E+00	0.000E+00	2.190E-01
6.051453E+00	8.01751E+01	1.3524E+01	4.5001E+02	7.7393E+00	0.000E+00	2.049E-01
6.469004E+00	8.03390E+01	1.2228E+01	3.8062E+02	7.3864E+00	0.000E+00	1.917E-01
6.915365E+00	8.03231E+01	1.1056E+01	3.2192E+02	7.0335E+00	0.000E+00	1.793E-01
7.392525E+00	8.02398E+01	1.0014E+01	2.7278E+02	6.6825E+00	0.000E+00	1.677E-01
7.902609E+00	8.01500E+01	9.0751E+00	2.3123E+02	6.3350E+00	0.000E+00	1.569E-01
8.447890E+00	7.99967E+01	8.2299E+00	1.9617E+02	5.9926E+00	0.000E+00	1.468E-01
9.030794E+00	7.98266E+01	7.4409E+00	1.6591E+02	5.6566E+00	0.000E+00	1.373E-01
9.653919E+00	7.95165E+01	6.6542E+00	1.3879E+02	5.3284E+00	0.000E+00	1.284E-01
1.032004E+01	7.90905E+01	5.9606E+00	1.1630E+02	5.0089E+00	0.000E+00	1.201E-01
1.103212E+01	7.85285E+01	5.3481E+00	9.7614E+01	4.6992E+00	0.000E+00	1.124E-01
1.179334E+01	7.77329E+01	4.7928E+00	8.1833E+01	4.3999E+00	0.000E+00	1.051E-01
1.260708E+01	7.63493E+01	4.2946E+00	6.8593E+01	4.1119E+00	0.000E+00	9.834E-02
1.315023E+01	7.42164E+01	4.0092E+00	6.1391E+01	3.9358E+00	0.000E+00	9.428E-02
1.335151E+01	7.15534E+01	3.9118E+00	5.8995E+01	3.8736E+00	0.000E+00	9.286E-02
1.340518E+01	6.84285E+01	3.8865E+00	5.8379E+01	3.8572E+00	0.000E+00	9.249E-02
1.347697E+01	7.12647E+01	9.9711E+00	1.4898E+02	3.8356E+00	0.000E+00	9.200E-02
1.348569E+01	7.15420E+01	9.9601E+00	1.4872E+02	3.8329E+00	0.000E+00	9.194E-02
1.368697E+01	7.42949E+01	9.7124E+00	1.4289E+02	3.7732E+00	0.000E+00	9.059E-02
1.440688E+01	7.65928E+01	8.8901E+00	1.2425E+02	3.5713E+00	0.000E+00	8.606E-02
1.540095E+01	7.64559E+01	7.9170E+00	1.0351E+02	3.3194E+00	0.000E+00	8.050E-02
1.563254E+01	7.52480E+01	7.7141E+00	9.9364E+01	3.2648E+00	0.000E+00	7.931E-02
1.569539E+01	7.36894E+01	7.6605E+00	9.8278E+01	3.2502E+00	0.000E+00	7.899E-02
1.578966E+01	7.52858E+01	1.0675E+01	1.3614E+02	3.2285E+00	0.000E+00	7.852E-02
1.602532E+01	7.66589E+01	1.0413E+01	1.3085E+02	3.1753E+00	0.000E+00	7.737E-02
1.605975E+01	7.67446E+01	1.0376E+01	1.3009E+02	3.1677E+00	0.000E+00	7.720E-02
1.630556E+01	7.67930E+01	1.0113E+01	1.2488E+02	3.1138E+00	0.000E+00	7.604E-02
1.637111E+01	7.61419E+01	1.0044E+01	1.2354E+02	3.0997E+00	0.000E+00	7.573E-02
1.646362E+01	7.70952E+01	1.1524E+01	1.4095E+02	3.0800E+00	0.000E+00	7.531E-02
1.646944E+01	7.71442E+01	1.1518E+01	1.4082E+02	3.0788E+00	0.000E+00	7.528E-02
1.671525E+01	7.82901E+01	1.1259E+01	1.3563E+02	3.0273E+00	0.000E+00	7.417E-02
1.759961E+01	8.00284E+01	1.0396E+01	1.1895E+02	2.8532E+00	0.000E+00	7.045E-02
1.881398E+01	8.12193E+01	9.3528E+00	1.0010E+02	2.6389E+00	0.000E+00	6.590E-02
2.011215E+01	8.19554E+01	8.4136E+00	8.4236E+01	2.4370E+00	0.000E+00	6.165E-02
2.149988E+01	8.24469E+01	7.5653E+00	7.0854E+01	2.2473E+00	0.000E+00	5.767E-02
2.298338E+01	8.27776E+01	6.8012E+00	5.9586E+01	2.0695E+00	0.000E+00	5.395E-02
2.456923E+01	8.30020E+01	6.1175E+00	5.0137E+01	1.9033E+00	0.000E+00	5.046E-02
2.626450E+01	8.31578E+01	5.5060E+00	4.2212E+01	1.7484E+00	0.000E+00	4.721E-02
2.807676E+01	8.33329E+01	4.9197E+00	3.5283E+01	1.6043E+00	0.000E+00	4.416E-02
3.001405E+01	8.33697E+01	4.3877E+00	2.9436E+01	1.4705E+00	0.000E+00	4.131E-02
3.208502E+01	8.34019E+01	3.9147E+00	2.4568E+01	1.3467E+00	0.000E+00	3.864E-02
3.429889E+01	8.33971E+01	3.4839E+00	2.0453E+01	1.2323E+00	0.000E+00	3.615E-02
3.666551E+01	8.33394E+01	3.1000E+00	1.7025E+01	1.1269E+00	0.000E+00	3.381E-02
3.919243E+01	8.32653E+01	2.7606E+00	1.4182E+01	1.0299E+00	0.000E+00	3.163E-02
4.189992E+01	8.31805E+01	2.4602E+00	1.1823E+01	9.4091E-01	0.000E+00	2.959E-02
4.479101E+01	8.30883E+01	2.1941E+00	9.8638E+00	8.5935E-01	0.000E+00	2.768E-02
4.788159E+01	8.29909E+01	1.9583E+00	8.2354E+00	7.8476E-01	0.000E+00	2.589E-02
5.118542E+01	8.28892E+01	1.7492E+00	6.8811E+00	7.1667E-01	0.000E+00	2.422E-02
5.471721E+01	8.27830E+01	1.5635E+00	5.7538E+00	6.5462E-01	0.000E+00	2.266E-02
5.849270E+01	8.26715E+01	1.3982E+00	4.8133E+00	5.9818E-01	0.000E+00	2.120E-02
6.252870E+01	8.25504E+01	1.2486E+00	4.0207E+00	5.4690E-01	0.000E+00	1.983E-02
6.684318E+01	8.24143E+01	1.1160E+00	3.3618E+00	5.0039E-01	0.000E+00	1.855E-02
7.145536E+01	8.22538E+01	9.9662E-01	2.8085E+00	4.5825E-01	0.000E+00	1.735E-02
7.638578E+01	8.20458E+01	8.8760E-01	2.3398E+00	4.2013E-01	0.000E+00	1.623E-02
8.165640E+01	8.17328E+01	7.8887E-01	1.9453E+00	3.8568E-01	0.000E+00	1.518E-02
8.729069E+01	8.10362E+01	6.9733E-01	1.6086E+00	3.5457E-01	0.000E+00	1.420E-02
8.871538E+01	8.06187E+01	6.7685E-01	1.5363E+00	3.4749E-01	0.000E+00	1.398E-02
9.007327E+01	7.95832E+01	6.5820E-01	1.4714E+00	3.4101E-01	0.000E+00	1.376E-02

TABLE I: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
9.043538E+01	7.83443E+01	6.5336E-01	1.4548E+00	3.3932E-01	0.000E+00	1.371E-02
9.097853E+01	7.96356E+01	3.0842E+00	6.8261E+00	3.3682E-01	5.396E+00	1.363E-02
9.233642E+01	8.07647E+01	3.0142E+00	6.5730E+00	3.3074E-01	5.202E+00	1.343E-02
9.331374E+01	8.11246E+01	2.9652E+00	6.3986E+00	3.2650E-01	5.067E+00	1.329E-02
9.975239E+01	8.21272E+01	2.6704E+00	5.3905E+00	3.0119E-01	4.288E+00	1.243E-02
1.066353E+02	8.25650E+01	2.4016E+00	4.5349E+00	2.7838E-01	3.621E+00	1.163E-02
1.139931E+02	8.28245E+01	2.1570E+00	3.8102E+00	2.5783E-01	3.053E+00	1.088E-02
1.218587E+02	8.29931E+01	1.9366E+00	3.2001E+00	2.3932E-01	2.572E+00	1.017E-02
1.302669E+02	8.31076E+01	1.7377E+00	2.6861E+00	2.2263E-01	2.164E+00	9.518E-03
1.392553E+02	8.31841E+01	1.5569E+00	2.2512E+00	2.0758E-01	1.818E+00	8.903E-03
1.488640E+02	8.32340E+01	1.3948E+00	1.8866E+00	1.9401E-01	1.526E+00	8.329E-03
1.591356E+02	8.32652E+01	1.2495E+00	1.5811E+00	1.8175E-01	1.281E+00	7.791E-03
1.701159E+02	8.32831E+01	1.1195E+00	1.3251E+00	1.7066E-01	1.075E+00	7.288E-03
1.818539E+02	8.32912E+01	1.0030E+00	1.1106E+00	1.6061E-01	9.026E-01	6.818E-03
1.944018E+02	8.32924E+01	8.9864E-01	9.3081E-01	1.5149E-01	7.574E-01	6.378E-03
2.078156E+02	8.32882E+01	8.0500E-01	7.8000E-01	1.4319E-01	6.354E-01	5.966E-03
2.221548E+02	8.32803E+01	7.2120E-01	6.5369E-01	1.3563E-01	5.330E-01	5.581E-03
2.374835E+02	8.32698E+01	6.4618E-01	5.4789E-01	1.2870E-01	4.472E-01	5.221E-03
2.538699E+02	8.32575E+01	5.7903E-01	4.5927E-01	1.2235E-01	3.751E-01	4.884E-03
2.713869E+02	8.32441E+01	5.1891E-01	3.8502E-01	1.1650E-01	3.147E-01	4.569E-03
2.901126E+02	8.32301E+01	4.6508E-01	3.2280E-01	1.1109E-01	2.640E-01	4.274E-03
3.101304E+02	8.32159E+01	4.1687E-01	2.7066E-01	1.0607E-01	2.215E-01	3.998E-03
3.315294E+02	8.32018E+01	3.7369E-01	2.2697E-01	1.0140E-01	1.858E-01	3.740E-03
3.544049E+02	8.31879E+01	3.3502E-01	1.9034E-01	9.7030E-02	1.559E-01	3.498E-03
3.788588E+02	8.31744E+01	3.0037E-01	1.5964E-01	9.2930E-02	1.307E-01	3.273E-03
4.050001E+02	8.31615E+01	2.6933E-01	1.3390E-01	8.9067E-02	1.097E-01	3.061E-03
4.329451E+02	8.31491E+01	2.4151E-01	1.1232E-01	8.5414E-02	9.201E-02	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 581

Po Z = 84

Atomic weight = 2.090000E+02 g/mol, nominal density ρ (g/cm³) = 9.3000E+00

μ_0 (barns/atom) = μ (cm²/g) \times 3.47053E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.01341E+05

24 edges. Edge energies (keV):

K	\	9.31050E+00	L	I	1.69393E+00	L	II	1.62443E+00	L	III	1.38138E+01
M	I	4.14940E+00	M	II	3.85410E+00	M	III	3.30190E+00	M	IV	2.79800E+00
M	V	2.68300E+00	N	I	9.95300E-00	N	II	8.51000E-00	N	III	7.05000E-01
N	IV	5.00200E-00	N	V	4.73400E-00	N	VI	1.75344E-00	N	VII	1.69362E-01
O	I	1.70906E-00	O	II	1.25695E-00	O	III	9.83141E-02	O	IV	3.14000E-02
O	V	3.14000E-02	P	I	1.67777E-02	P	II	7.55974E-03	P	III	5.39477E-03

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.0248E+00, -1.1838E+00 e/atom

Nuclear Thomson correction f_{NT} = -1.8520E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
5.286876E-03	-9.37416E-01	0.0000E+00	0.0000E+00	5.1517E-06	0.000E+00	2.345E+02
5.367797E-03	-2.41276E+00	0.0000E+00	0.0000E+00	5.6056E-06	0.000E+00	2.310E+02
5.389376E-03	-4.15553E+00	0.0000E+00	0.0000E+00	5.7317E-06	0.000E+00	2.301E+02
5.421745E-03	-2.35734E+00	3.4161E+00	1.2686E+05	5.9250E-06	0.000E+00	2.287E+02
5.502667E-03	-8.04519E-01	3.3425E+00	1.2230E+05	6.4306E-06	0.000E+00	2.253E+02
7.408549E-03	-4.02942E-01	2.3271E+00	6.3243E+04	3.1427E-05	0.000E+00	1.674E+02
7.521945E-03	-1.99692E+00	2.2951E+00	6.1432E+04	3.3981E-05	0.000E+00	1.648E+02
7.552184E-03	-3.91935E+00	2.2868E+00	6.0965E+04	3.4688E-05	0.000E+00	1.642E+02
7.597543E-03	-1.93282E+00	6.0662E+00	1.6076E+05	3.5769E-05	0.000E+00	1.632E+02
7.710939E-03	-1.78513E-01	6.0099E+00	1.5692E+05	3.8585E-05	0.000E+00	1.608E+02
1.069000E-02	4.34264E+00	4.8462E+00	9.1275E+04	1.9188E-04	0.000E+00	1.160E+02
1.142761E-02	4.66024E+00	4.5909E+00	8.0886E+04	2.6216E-04	0.000E+00	1.085E+02
1.221612E-02	4.90165E+00	4.3239E+00	7.1265E+04	3.5634E-04	0.000E+00	1.015E+02
1.305903E-02	5.06722E+00	4.0467E+00	6.2391E+04	4.8186E-04	0.000E+00	9.494E+01
1.396010E-02	5.15153E+00	3.7622E+00	5.4260E+04	6.4826E-04	0.000E+00	8.881E+01
1.492335E-02	5.13926E+00	3.4740E+00	4.6870E+04	8.6769E-04	0.000E+00	8.308E+01
1.595306E-02	4.97290E+00	3.1862E+00	4.0212E+04	1.1555E-03	0.000E+00	7.772E+01
1.644213E-02	4.75222E+00	3.0571E+00	3.7436E+04	1.3133E-03	0.000E+00	7.541E+01
1.669379E-02	4.40369E+00	2.9927E+00	3.6094E+04	1.4001E-03	0.000E+00	7.427E+01
1.676090E-02	3.99143E+00	2.9757E+00	3.5746E+04	1.4239E-03	0.000E+00	7.397E+01
1.686157E-02	4.42715E+00	3.7563E+00	4.4854E+04	1.4601E-03	0.000E+00	7.353E+01
1.705382E-02	4.74215E+00	3.6743E+00	4.3380E+04	1.5311E-03	0.000E+00	7.270E+01
1.711323E-02	4.79144E+00	3.6495E+00	4.2937E+04	1.5535E-03	0.000E+00	7.245E+01
1.823053E-02	5.03153E+00	3.2248E+00	3.5615E+04	2.0185E-03	0.000E+00	6.801E+01
1.948844E-02	4.88825E+00	2.8269E+00	2.9205E+04	2.6480E-03	0.000E+00	6.362E+01
2.083314E-02	4.55514E+00	2.4755E+00	2.3924E+04	3.4566E-03	0.000E+00	5.951E+01
2.227063E-02	4.05987E+00	2.1655E+00	1.9578E+04	4.4900E-03	0.000E+00	5.567E+01
2.380730E-02	3.39001E+00	1.8925E+00	1.6005E+04	5.8038E-03	0.000E+00	5.208E+01
2.545001E-02	2.50807E+00	1.6524E+00	1.3072E+04	7.4657E-03	0.000E+00	4.872E+01
2.720606E-02	1.33278E+00	1.4416E+00	1.0668E+04	9.5573E-03	0.000E+00	4.557E+01
2.908327E-02	-3.08155E-01	1.2569E+00	8.7014E+03	1.2176E-02	0.000E+00	4.263E+01
3.077200E-02	-2.46486E+00	1.1190E+00	7.3217E+03	1.4889E-02	0.000E+00	4.029E+01
3.109002E-02	-3.08405E+00	1.0956E+00	7.0951E+03	1.5439E-02	0.000E+00	3.988E+01
3.124300E-02	-3.49185E+00	1.0846E+00	6.9894E+03	1.5708E-02	0.000E+00	3.968E+01
3.136860E-02	-4.11851E+00	1.0757E+00	6.9041E+03	1.5931E-02	0.000E+00	3.952E+01
3.155700E-02	-4.04359E+00	1.9350E+00	1.2346E+04	1.6269E-02	0.000E+00	3.929E+01
3.202800E-02	-4.46733E+00	2.1199E+00	1.3327E+04	1.7135E-02	0.000E+00	3.871E+01
3.323523E-02	-6.27486E+00	2.8516E+00	1.7275E+04	1.9483E-02	0.000E+00	3.731E+01
3.552846E-02	-1.03112E+01	5.8749E+00	3.3293E+04	2.4471E-02	0.000E+00	3.490E+01
3.797993E-02	-1.37002E+01	1.1670E+01	6.1867E+04	3.0593E-02	0.000E+00	3.264E+01
4.060054E-02	-1.46203E+01	1.9832E+01	9.8350E+04	3.8069E-02	0.000E+00	3.054E+01
4.340198E-02	-1.17266E+01	2.8708E+01	1.3317E+05	4.7153E-02	0.000E+00	2.857E+01
4.639671E-02	-5.05348E+00	3.6047E+01	1.5643E+05	5.8137E-02	0.000E+00	2.672E+01
4.959809E-02	4.00012E+00	4.0152E+01	1.6299E+05	7.1353E-02	0.000E+00	2.500E+01
5.302035E-02	1.34722E+01	4.0538E+01	1.5394E+05	8.7179E-02	0.000E+00	2.338E+01
5.667876E-02	2.17164E+01	3.7827E+01	1.3437E+05	1.0604E-01	0.000E+00	2.187E+01
6.058959E-02	2.78497E+01	3.3190E+01	1.1079E+05	1.2840E-01	0.000E+00	2.046E+01
6.477028E-02	3.17236E+01	2.7795E+01	8.6400E+04	1.5478E-01	0.000E+00	1.914E+01
6.923942E-02	3.36554E+01	2.2503E+01	6.5438E+04	1.8577E-01	0.000E+00	1.791E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
7.401695E-02	3.41429E+01	1.7810E+01	4.8446E+04	2.2199E-01	0.000E+00	1.675E+01
7.912411E-02	3.36700E+01	1.3907E+01	3.5388E+04	2.6411E-01	0.000E+00	1.567E+01
8.458368E-02	3.26109E+01	1.0798E+01	2.5704E+04	3.1288E-01	0.000E+00	1.466E+01
9.041995E-02	3.11832E+01	8.3912E+00	1.8685E+04	3.6906E-01	0.000E+00	1.371E+01
9.634786E-02	2.93011E+01	6.6374E+00	1.3870E+04	4.3017E-01	0.000E+00	1.287E+01
9.665893E-02	2.91520E+01	6.5603E+00	1.3665E+04	4.3348E-01	0.000E+00	1.283E+01
9.782257E-02	2.82875E+01	6.2831E+00	1.2932E+04	4.4597E-01	0.000E+00	1.267E+01
9.821583E-02	2.73356E+01	6.1932E+00	1.2696E+04	4.5023E-01	0.000E+00	1.262E+01
9.880571E-02	2.81544E+01	7.7889E+00	1.5872E+04	4.5664E-01	0.000E+00	1.255E+01
1.002804E-01	2.86859E+01	7.4102E+00	1.4878E+04	4.7283E-01	0.000E+00	1.236E+01
1.033284E-01	2.86682E+01	6.7105E+00	1.3076E+04	5.0700E-01	0.000E+00	1.200E+01
1.104581E-01	2.78604E+01	5.4257E+00	9.8899E+03	5.9049E-01	0.000E+00	1.122E+01
1.180797E-01	2.67265E+01	4.4669E+00	7.6166E+03	6.8488E-01	0.000E+00	1.050E+01
1.231813E-01	2.57564E+01	3.9909E+00	6.5232E+03	7.5077E-01	0.000E+00	1.007E+01
1.250667E-01	2.50497E+01	3.8405E+00	6.1827E+03	7.7563E-01	0.000E+00	9.913E+00
1.255695E-01	2.44003E+01	3.8024E+00	6.0968E+03	7.8231E-01	0.000E+00	9.874E+00
1.262272E-01	2.48901E+01	4.9240E+00	7.8541E+03	7.9107E-01	0.000E+00	9.822E+00
1.263237E-01	2.49441E+01	4.9147E+00	7.8333E+03	7.9236E-01	0.000E+00	9.815E+00
1.282091E-01	2.52820E+01	4.7404E+00	7.4444E+03	8.1766E-01	0.000E+00	9.670E+00
1.349384E-01	2.50633E+01	4.2126E+00	6.2856E+03	9.0997E-01	0.000E+00	9.188E+00
1.442475E-01	2.43241E+01	3.6646E+00	5.1150E+03	1.0425E+00	0.000E+00	8.595E+00
1.542005E-01	2.33895E+01	3.2370E+00	4.2266E+03	1.1895E+00	0.000E+00	8.040E+00
1.648404E-01	2.22058E+01	2.9046E+00	3.5478E+03	1.3517E+00	0.000E+00	7.521E+00
1.659746E-01	2.20528E+01	2.8750E+00	3.4877E+03	1.3693E+00	0.000E+00	7.470E+00
1.674882E-01	2.18240E+01	2.8371E+00	3.4105E+03	1.3928E+00	0.000E+00	7.403E+00
1.685150E-01	2.16308E+01	2.8123E+00	3.3601E+03	1.4088E+00	0.000E+00	7.357E+00
1.691924E-01	2.14179E+01	2.7963E+00	3.3277E+03	1.4194E+00	0.000E+00	7.328E+00
1.702086E-01	2.13609E+01	3.0056E+00	3.5554E+03	1.4353E+00	0.000E+00	7.284E+00
1.707354E-01	2.12674E+01	3.0006E+00	3.5385E+03	1.4436E+00	0.000E+00	7.262E+00
1.718369E-01	2.12395E+01	3.1272E+00	3.6641E+03	1.4609E+00	0.000E+00	7.215E+00
1.727490E-01	2.11695E+01	3.1215E+00	3.6381E+03	1.4752E+00	0.000E+00	7.177E+00
1.744671E-01	2.09684E+01	3.1137E+00	3.5934E+03	1.5023E+00	0.000E+00	7.106E+00
1.751685E-01	2.08169E+01	3.1117E+00	3.5766E+03	1.5134E+00	0.000E+00	7.078E+00
1.762144E-01	2.07907E+01	3.2793E+00	3.7469E+03	1.5300E+00	0.000E+00	7.036E+00
1.762205E-01	2.07905E+01	3.2793E+00	3.7468E+03	1.5301E+00	0.000E+00	7.036E+00
1.788507E-01	2.05881E+01	3.3075E+00	3.7234E+03	1.5719E+00	0.000E+00	6.932E+00
1.883732E-01	1.96124E+01	3.5269E+00	3.7697E+03	1.7249E+00	0.000E+00	6.582E+00
2.013709E-01	1.82002E+01	4.1359E+00	4.1353E+03	1.9371E+00	0.000E+00	6.157E+00
2.152655E-01	1.67447E+01	5.1630E+00	4.8291E+03	2.1669E+00	0.000E+00	5.760E+00
2.301188E-01	1.53646E+01	6.6594E+00	5.8266E+03	2.4145E+00	0.000E+00	5.388E+00
2.459970E-01	1.42028E+01	8.6349E+00	7.0674E+03	2.6802E+00	0.000E+00	5.040E+00
2.629708E-01	1.34078E+01	1.1044E+01	8.4558E+03	2.9638E+00	0.000E+00	4.715E+00
2.811158E-01	1.31090E+01	1.3786E+01	9.8735E+03	3.2650E+00	0.000E+00	4.410E+00
3.005128E-01	1.33937E+01	1.6714E+01	1.1198E+04	3.5833E+00	0.000E+00	4.126E+00
3.212482E-01	1.42949E+01	1.9659E+01	1.2321E+04	3.9181E+00	0.000E+00	3.859E+00
3.434143E-01	1.57831E+01	2.2449E+01	1.3162E+04	4.2684E+00	0.000E+00	3.610E+00
3.671099E-01	1.77728E+01	2.4932E+01	1.3674E+04	4.6330E+00	0.000E+00	3.377E+00
3.924405E-01	2.01271E+01	2.6992E+01	1.3848E+04	5.0106E+00	0.000E+00	3.159E+00
4.195189E-01	2.26628E+01	2.8551E+01	1.3703E+04	5.3994E+00	0.000E+00	2.955E+00
4.484657E-01	2.50738E+01	2.9576E+01	1.3778E+04	5.7976E+00	0.000E+00	2.765E+00
4.639320E-01	2.59443E+01	2.9893E+01	1.2973E+04	6.0030E+00	0.000E+00	2.672E+00
4.710330E-01	2.58165E+01	2.9991E+01	1.2820E+04	6.0955E+00	0.000E+00	2.632E+00
4.729266E-01	2.51573E+01	3.0013E+01	1.2778E+04	6.1200E+00	0.000E+00	2.622E+00
4.757670E-01	2.61423E+01	3.1612E+01	1.3378E+04	6.1566E+00	0.000E+00	2.606E+00
4.794098E-01	2.68550E+01	3.1677E+01	1.3304E+04	6.2035E+00	0.000E+00	2.586E+00
4.828680E-01	2.73126E+01	3.1733E+01	1.3232E+04	6.2473E+00	0.000E+00	2.568E+00
4.901960E-01	2.80349E+01	3.1835E+01	1.3076E+04	6.3398E+00	0.000E+00	2.529E+00
4.976990E-01	2.83940E+01	3.1915E+01	1.2911E+04	6.4333E+00	0.000E+00	2.491E+00
4.996998E-01	2.80886E+01	3.1933E+01	1.2867E+04	6.4580E+00	0.000E+00	2.481E+00
5.027010E-01	2.88697E+01	3.2946E+01	1.3195E+04	6.4949E+00	0.000E+00	2.466E+00
5.102040E-01	3.00329E+01	3.3034E+01	1.3036E+04	6.5864E+00	0.000E+00	2.430E+00
5.124891E-01	3.03067E+01	3.3058E+01	1.2987E+04	6.6140E+00	0.000E+00	2.419E+00
5.478508E-01	3.37978E+01	3.3218E+01	1.2208E+04	7.0275E+00	0.000E+00	2.263E+00
5.856525E-01	3.68380E+01	3.3006E+01	1.1347E+04	7.4411E+00	0.000E+00	2.117E+00
6.260625E-01	3.95408E+01	3.2463E+01	1.0440E+04	7.8521E+00	0.000E+00	1.980E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 583

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
6.692609E-01	4.17480E+01	3.1653E+01	9.5224E+03	8.2578E+00	0.000E+00	1.853E+00
6.909000E-01	4.23629E+01	3.1192E+01	9.0898E+03	8.4486E+00	0.000E+00	1.795E+00
7.014750E-01	4.20496E+01	3.0957E+01	8.8853E+03	8.5389E+00	0.000E+00	1.767E+00
7.042950E-01	4.11943E+01	3.0893E+01	8.8316E+03	8.5627E+00	0.000E+00	1.760E+00
7.085250E-01	4.23981E+01	3.2743E+01	9.3045E+03	8.5981E+00	0.000E+00	1.750E+00
7.154399E-01	4.34042E+01	3.2588E+01	9.1710E+03	8.6553E+00	0.000E+00	1.733E+00
7.191000E-01	4.37639E+01	3.2506E+01	9.1013E+03	8.6853E+00	0.000E+00	1.724E+00
7.648052E-01	4.66368E+01	3.1459E+01	8.2820E+03	9.0418E+00	0.000E+00	1.621E+00
8.175768E-01	4.89290E+01	3.0235E+01	7.4459E+03	9.4145E+00	0.000E+00	1.516E+00
8.339800E-01	4.94831E+01	2.9839E+01	7.2038E+03	9.5223E+00	0.000E+00	1.487E+00
8.467450E-01	4.97740E+01	2.9534E+01	7.0226E+03	9.6038E+00	0.000E+00	1.464E+00
8.501490E-01	4.96859E+01	2.9449E+01	6.9743E+03	9.6251E+00	0.000E+00	1.458E+00
8.552550E-01	5.00709E+01	2.9730E+01	6.9990E+03	9.6569E+00	0.000E+00	1.450E+00
8.680200E-01	5.06769E+01	2.9421E+01	6.8243E+03	9.7348E+00	0.000E+00	1.428E+00
8.739896E-01	5.09075E+01	2.9278E+01	6.7447E+03	9.7705E+00	0.000E+00	1.419E+00
9.342948E-01	5.27628E+01	2.7898E+01	6.0120E+03	1.0107E+01	0.000E+00	1.327E+00
9.753940E-01	5.37020E+01	2.7037E+01	5.5809E+03	1.0313E+01	0.000E+00	1.271E+00
9.903235E-01	5.38528E+01	2.6741E+01	5.4367E+03	1.0383E+01	0.000E+00	1.252E+00
9.943047E-01	5.36661E+01	2.6664E+01	5.3993E+03	1.0402E+01	0.000E+00	1.247E+00
9.987612E-01	5.40210E+01	2.7156E+01	5.4745E+03	1.0422E+01	0.000E+00	1.241E+00
1.000276E+00	5.41309E+01	2.7123E+01	5.4595E+03	1.0429E+01	0.000E+00	1.239E+00
1.015206E+00	5.48015E+01	2.6636E+01	5.2826E+03	1.0495E+01	0.000E+00	1.221E+00
1.067676E+00	5.61387E+01	2.5065E+01	4.7268E+03	1.0712E+01	0.000E+00	1.161E+00
1.141343E+00	5.72483E+01	2.3179E+01	4.0890E+03	1.0976E+01	0.000E+00	1.086E+00
1.220098E+00	5.79753E+01	2.1482E+01	3.5450E+03	1.1212E+01	0.000E+00	1.016E+00
1.304285E+00	5.84262E+01	1.9939E+01	3.0780E+03	1.1417E+01	0.000E+00	9.506E-01
1.394281E+00	5.86649E+01	1.8552E+01	2.6790E+03	1.1591E+01	0.000E+00	8.892E-01
1.490486E+00	5.87419E+01	1.7293E+01	2.3360E+03	1.1731E+01	0.000E+00	8.318E-01
1.593329E+00	5.86419E+01	1.6148E+01	2.0406E+03	1.1838E+01	0.000E+00	7.781E-01
1.703269E+00	5.83441E+01	1.5110E+01	1.7862E+03	1.1910E+01	0.000E+00	7.279E-01
1.820795E+00	5.78255E+01	1.4160E+01	1.5658E+03	1.1948E+01	0.000E+00	6.809E-01
1.946430E+00	5.70148E+01	1.3244E+01	1.3700E+03	1.1951E+01	0.000E+00	6.370E-01
2.080733E+00	5.56889E+01	1.2296E+01	1.1898E+03	1.1920E+01	0.000E+00	5.959E-01
2.224304E+00	5.34738E+01	1.1403E+01	1.0322E+03	1.1855E+01	0.000E+00	5.574E-01
2.377781E+00	4.94760E+01	1.0591E+01	8.9684E+02	1.1757E+01	0.000E+00	5.214E-01
2.541848E+00	3.99177E+01	9.8500E+00	7.8022E+02	1.1628E+01	0.000E+00	4.878E-01
2.629340E+00	2.41134E+01	9.4994E+00	7.2741E+02	1.1550E+01	0.000E+00	4.715E-01
2.669585E+00	-6.35847E+00	9.3472E+00	7.0497E+02	1.1513E+01	0.000E+00	4.644E-01
2.680317E+00	-5.24059E+01	9.3076E+00	6.9917E+02	1.1503E+01	0.000E+00	4.626E-01
2.696415E+00	1.84757E+01	9.9473E+01	7.4277E+03	1.1488E+01	0.000E+00	4.598E-01
2.717235E+00	4.99545E+01	7.4943E+01	5.5531E+03	1.1468E+01	0.000E+00	4.563E-01
2.736660E+00	5.75827E+01	5.8180E+01	4.2804E+03	1.1449E+01	0.000E+00	4.530E-01
2.742040E+00	5.79975E+01	5.4356E+01	3.9912E+03	1.1444E+01	0.000E+00	4.522E-01
2.784010E+00	4.02457E+01	3.3189E+01	2.4002E+03	1.1403E+01	0.000E+00	4.453E-01
2.795202E+00	6.86808E+00	2.9465E+01	2.1224E+03	1.1392E+01	0.000E+00	4.436E-01
2.811990E+00	5.44081E+01	8.5241E+01	6.1034E+03	1.1375E+01	0.000E+00	4.409E-01
2.853960E+00	7.80007E+01	5.4963E+01	3.8776E+03	1.1332E+01	0.000E+00	4.344E-01
2.904724E+00	7.61779E+01	3.7427E+01	2.5942E+03	1.1280E+01	0.000E+00	4.268E-01
3.105150E+00	6.58025E+01	3.2310E+01	2.0950E+03	1.1065E+01	0.000E+00	3.993E-01
3.235862E+00	6.70092E+01	3.1992E+01	1.9906E+03	1.0920E+01	0.000E+00	3.832E-01
3.285390E+00	6.62387E+01	3.1447E+01	1.9272E+03	1.0864E+01	0.000E+00	3.774E-01
3.298598E+00	6.41416E+01	3.1269E+01	1.9086E+03	1.0850E+01	0.000E+00	3.759E-01
3.319406E+00	6.72376E+01	3.5745E+01	2.1682E+03	1.0826E+01	0.000E+00	3.735E-01
3.367938E+00	7.05932E+01	3.4795E+01	2.0801E+03	1.0771E+01	0.000E+00	3.681E-01
3.548445E+00	7.48382E+01	2.9257E+01	1.6600E+03	1.0564E+01	0.000E+00	3.494E-01
3.777018E+00	7.47922E+01	2.5451E+01	1.3567E+03	1.0300E+01	0.000E+00	3.283E-01
3.793288E+00	7.47169E+01	2.5275E+01	1.3416E+03	1.0282E+01	0.000E+00	3.269E-01
3.834829E+00	7.42219E+01	2.4839E+01	1.3041E+03	1.0234E+01	0.000E+00	3.233E-01
3.850246E+00	7.33694E+01	2.4680E+01	1.2906E+03	1.0216E+01	0.000E+00	3.220E-01
3.873370E+00	7.43597E+01	2.6215E+01	1.3627E+03	1.0189E+01	0.000E+00	3.201E-01
3.931182E+00	7.53345E+01	2.5578E+01	1.3100E+03	1.0123E+01	0.000E+00	3.154E-01
4.055024E+00	7.60423E+01	2.4314E+01	1.2073E+03	9.9813E+00	0.000E+00	3.058E-01
4.066412E+00	7.60649E+01	2.4210E+01	1.1987E+03	9.9683E+00	0.000E+00	3.049E-01
4.128653E+00	7.59358E+01	2.3656E+01	1.1537E+03	9.8975E+00	0.000E+00	3.003E-01
4.145251E+00	7.54824E+01	2.3514E+01	1.1421E+03	9.8787E+00	0.000E+00	2.991E-01

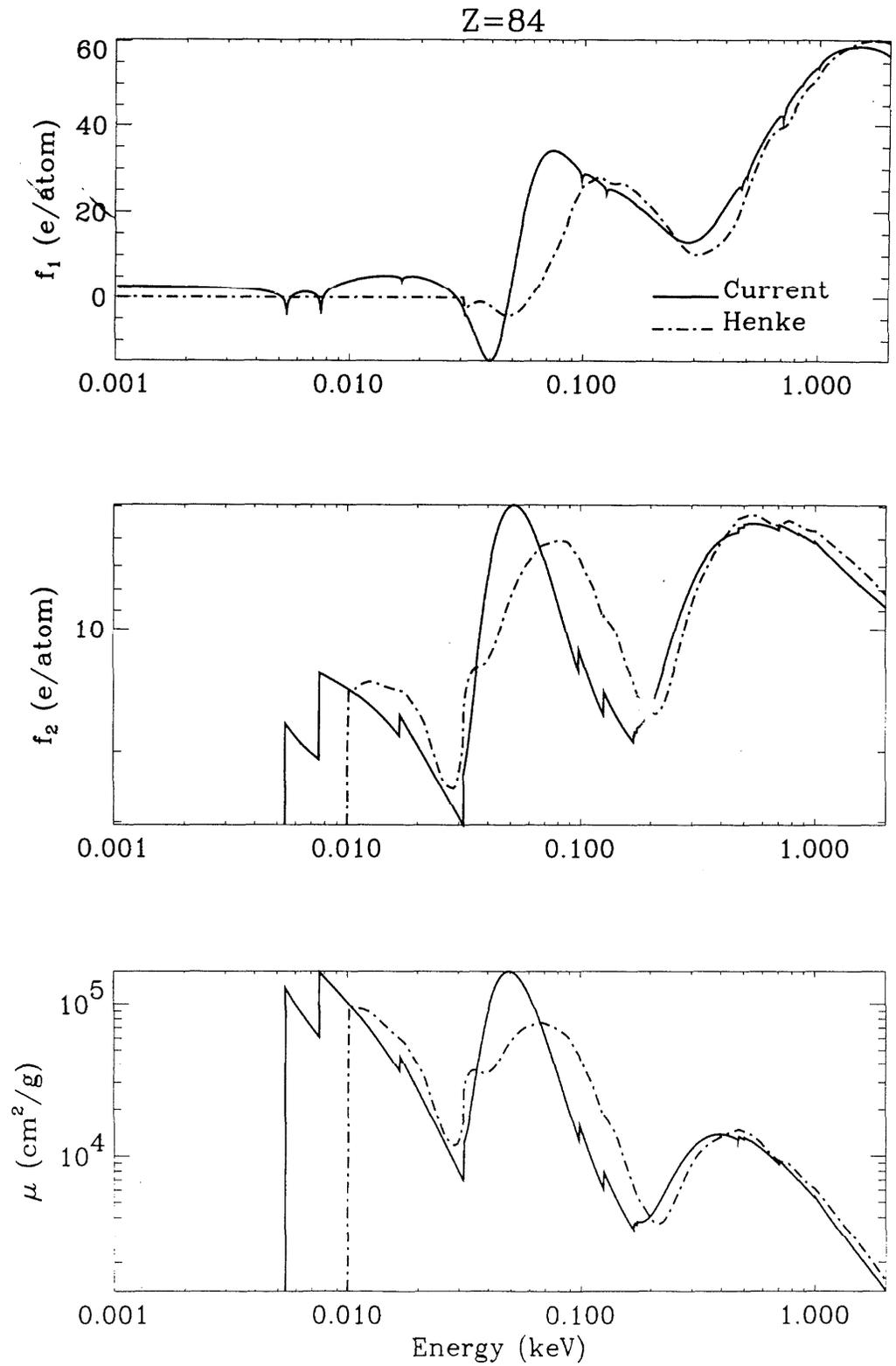
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

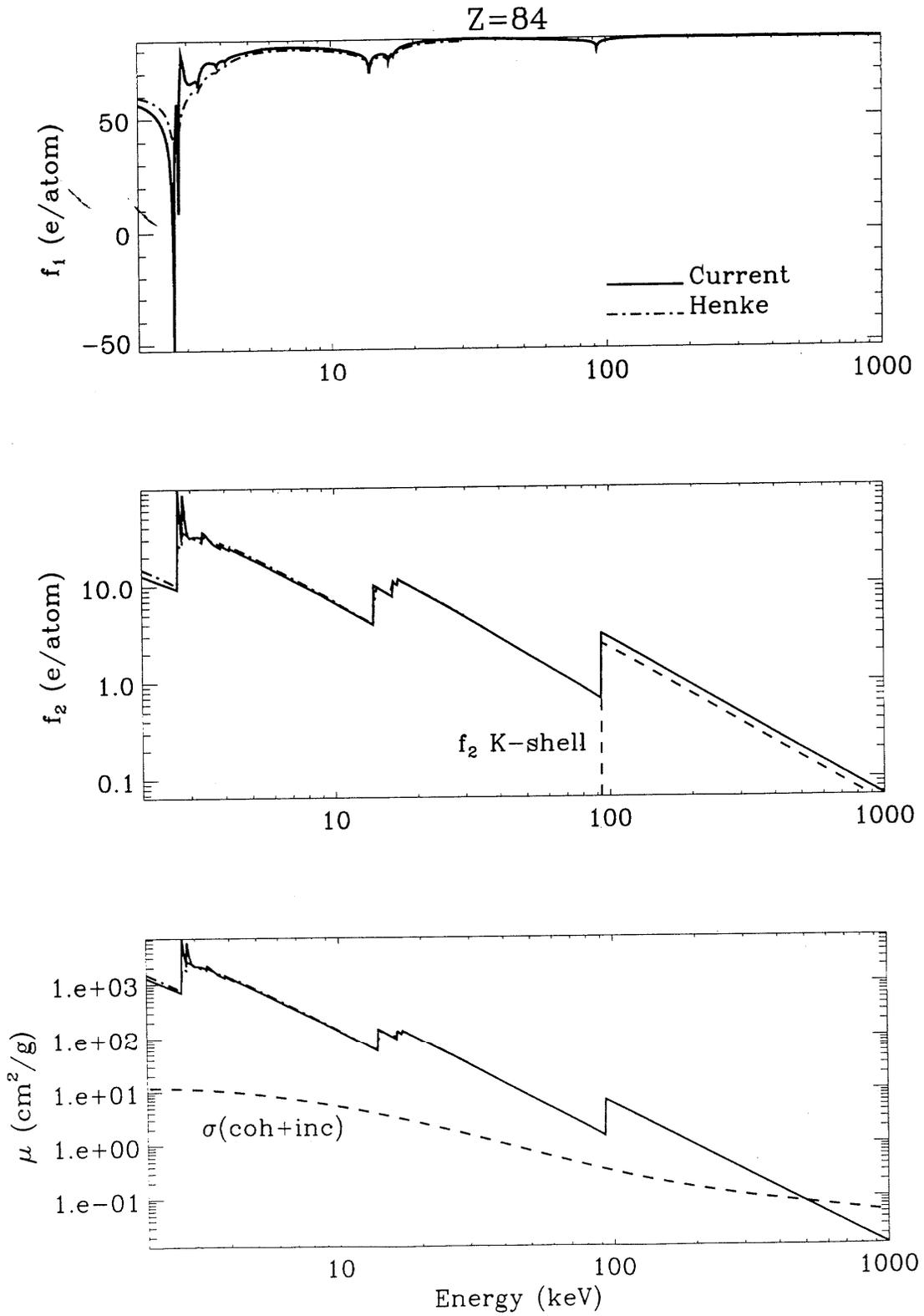
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
4.170147E+00	7.61302E+01	2.4348E+01	1.1756E+03	9.8504E+00	0.000E+00	2.973E-01
4.232388E+00	7.68682E+01	2.3837E+01	1.1339E+03	9.7802E+00	0.000E+00	2.929E-01
4.334821E+00	7.75425E+01	2.3034E+01	1.0699E+03	9.6652E+00	0.000E+00	2.860E-01
4.633924E+00	7.87420E+01	2.0944E+01	9.0998E+02	9.3359E+00	0.000E+00	2.676E-01
4.953664E+00	7.95667E+01	1.9089E+01	7.7586E+02	8.9956E+00	0.000E+00	2.503E-01
5.295467E+00	8.02002E+01	1.7377E+01	6.6069E+02	8.6466E+00	0.000E+00	2.341E-01
5.660855E+00	8.09595E+01	1.5736E+01	5.5968E+02	8.2914E+00	0.000E+00	2.190E-01
6.051453E+00	8.12080E+01	1.4206E+01	4.7265E+02	7.9320E+00	0.000E+00	2.049E-01
6.469004E+00	8.13170E+01	1.2843E+01	3.9973E+02	7.5706E+00	0.000E+00	1.917E-01
6.915365E+00	8.14237E+01	1.1613E+01	3.3811E+02	7.2091E+00	0.000E+00	1.793E-01
7.392525E+00	8.13638E+01	1.0512E+01	2.8630E+02	6.8494E+00	0.000E+00	1.677E-01
7.902609E+00	8.12942E+01	9.5287E+00	2.4277E+02	6.4933E+00	0.000E+00	1.569E-01
8.447890E+00	8.11641E+01	8.6437E+00	2.0601E+02	6.1424E+00	0.000E+00	1.468E-01
9.030794E+00	8.10095E+01	7.8208E+00	1.7436E+02	5.7980E+00	0.000E+00	1.373E-01
9.653919E+00	8.07345E+01	6.9929E+00	1.4584E+02	5.4614E+00	0.000E+00	1.284E-01
1.032004E+01	8.03512E+01	6.2610E+00	1.2215E+02	5.1338E+00	0.000E+00	1.201E-01
1.103212E+01	7.98518E+01	5.6151E+00	1.0248E+02	4.8162E+00	0.000E+00	1.124E-01
1.179334E+01	7.91788E+01	5.0408E+00	8.6059E+01	4.5094E+00	0.000E+00	1.051E-01
1.260708E+01	7.81391E+01	4.5179E+00	7.2153E+01	4.2140E+00	0.000E+00	9.834E-02
1.347697E+01	7.56777E+01	4.0535E+00	6.0558E+01	3.9306E+00	0.000E+00	9.200E-02
1.353752E+01	7.53005E+01	4.0242E+00	5.9851E+01	3.9119E+00	0.000E+00	9.159E-02
1.374473E+01	7.26547E+01	3.9267E+00	5.7521E+01	3.8493E+00	0.000E+00	9.020E-02
1.379999E+01	6.95496E+01	3.9014E+00	5.6922E+01	3.8329E+00	0.000E+00	8.984E-02
1.388287E+01	7.26427E+01	9.9368E+00	1.4411E+02	3.8085E+00	0.000E+00	8.931E-02
1.409008E+01	7.53795E+01	9.6932E+00	1.3851E+02	3.7485E+00	0.000E+00	8.799E-02
1.440688E+01	7.68213E+01	9.3377E+00	1.3050E+02	3.6595E+00	0.000E+00	8.606E-02
1.540095E+01	7.80433E+01	8.3210E+00	1.0878E+02	3.4012E+00	0.000E+00	8.050E-02
1.591941E+01	7.75740E+01	7.8563E+00	9.9363E+01	3.2778E+00	0.000E+00	7.788E-02
1.616308E+01	7.63557E+01	7.6515E+00	9.5313E+01	3.2222E+00	0.000E+00	7.671E-02
1.622806E+01	7.48051E+01	7.5982E+00	9.4271E+01	3.2076E+00	0.000E+00	7.640E-02
1.632552E+01	7.63871E+01	1.0594E+01	1.3065E+02	3.1860E+00	0.000E+00	7.595E-02
1.646362E+01	7.73820E+01	1.0446E+01	1.2775E+02	3.1557E+00	0.000E+00	7.531E-02
1.656919E+01	7.77430E+01	1.0336E+01	1.2559E+02	3.1328E+00	0.000E+00	7.483E-02
1.660051E+01	7.78177E+01	1.0303E+01	1.2496E+02	3.1261E+00	0.000E+00	7.469E-02
1.685460E+01	7.78673E+01	1.0045E+01	1.1999E+02	3.0724E+00	0.000E+00	7.356E-02
1.692236E+01	7.72212E+01	9.9772E+00	1.1871E+02	3.0583E+00	0.000E+00	7.327E-02
1.702400E+01	7.82161E+01	1.1440E+01	1.3530E+02	3.0374E+00	0.000E+00	7.283E-02
1.727809E+01	7.93527E+01	1.1183E+01	1.3032E+02	2.9861E+00	0.000E+00	7.176E-02
1.759961E+01	8.01319E+01	1.0872E+01	1.2438E+02	2.9231E+00	0.000E+00	7.045E-02
1.881398E+01	8.17458E+01	9.7930E+00	1.0480E+02	2.7033E+00	0.000E+00	6.590E-02
2.011215E+01	8.26546E+01	8.8107E+00	8.8203E+01	2.4963E+00	0.000E+00	6.165E-02
2.149988E+01	8.32446E+01	7.9269E+00	7.4233E+01	2.3017E+00	0.000E+00	5.767E-02
2.298338E+01	8.36422E+01	7.1288E+00	6.2451E+01	2.1194E+00	0.000E+00	5.395E-02
2.456923E+01	8.39129E+01	6.4136E+00	5.2559E+01	1.9491E+00	0.000E+00	5.046E-02
2.626450E+01	8.41068E+01	5.7737E+00	4.4260E+01	1.7902E+00	0.000E+00	4.721E-02
2.807676E+01	8.43076E+01	5.1650E+00	3.7038E+01	1.6425E+00	0.000E+00	4.416E-02
3.001405E+01	8.43615E+01	4.6062E+00	3.0899E+01	1.5054E+00	0.000E+00	4.131E-02
3.208502E+01	8.43709E+01	4.1120E+00	2.5804E+01	1.3785E+00	0.000E+00	3.864E-02
3.429889E+01	8.44133E+01	3.6662E+00	2.1521E+01	1.2613E+00	0.000E+00	3.615E-02
3.666551E+01	8.43661E+01	3.2619E+00	1.7912E+01	1.1533E+00	0.000E+00	3.381E-02
3.919543E+01	8.42986E+01	2.9044E+00	1.4919E+01	1.0540E+00	0.000E+00	3.163E-02
4.189992E+01	8.42183E+01	2.5881E+00	1.2436E+01	9.6278E-01	0.000E+00	2.959E-02
4.479101E+01	8.41295E+01	2.3080E+00	1.0375E+01	8.7924E-01	0.000E+00	2.768E-02
4.788159E+01	8.40346E+01	2.0597E+00	8.6609E+00	8.0286E-01	0.000E+00	2.589E-02
5.118542E+01	8.39352E+01	1.8395E+00	7.2357E+00	7.3314E-01	0.000E+00	2.422E-02
5.471721E+01	8.38314E+01	1.6441E+00	6.0496E+00	6.6961E-01	0.000E+00	2.266E-02
5.849270E+01	8.37228E+01	1.4705E+00	5.0616E+00	6.1183E-01	0.000E+00	2.120E-02
6.252870E+01	8.36071E+01	1.3140E+00	4.2312E+00	5.5934E-01	0.000E+00	1.983E-02
6.684318E+01	8.34787E+01	1.1743E+00	3.5372E+00	5.1174E-01	0.000E+00	1.855E-02
7.145536E+01	8.33311E+01	1.0500E+00	2.9586E+00	4.6863E-01	0.000E+00	1.735E-02
7.638578E+01	8.31488E+01	9.3655E-01	2.4686E+00	4.2962E-01	0.000E+00	1.623E-02
8.165640E+01	8.28940E+01	8.3262E-01	2.0530E+00	3.9438E-01	0.000E+00	1.518E-02
8.729069E+01	8.24362E+01	7.3620E-01	1.6981E+00	3.6256E-01	0.000E+00	1.420E-02
9.124290E+01	8.16339E+01	6.7872E-01	1.4977E+00	3.4318E-01	0.000E+00	1.359E-02
9.263948E+01	8.06048E+01	6.6011E-01	1.4347E+00	3.3683E-01	0.000E+00	1.338E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 585

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
9.301190E+01	7.93737E+01	6.5528E-01	1.4185E+00	3.3518E-01	0.000E+00	1.333E-02
9.331374E+01	8.00216E+01	3.0839E+00	6.6541E+00	3.3386E-01	5.249E+00	1.329E-02
9.357053E+01	8.06569E+01	3.0708E+00	6.6076E+00	3.3274E-01	5.213E+00	1.325E-02
9.496710E+01	8.17789E+01	3.0009E+00	6.3622E+00	3.2678E-01	5.025E+00	1.306E-02
9.975239E+01	8.28390E+01	2.7786E+00	5.6085E+00	3.0798E-01	4.444E+00	1.243E-02
1.066353E+02	8.34136E+01	2.5008E+00	4.7218E+00	2.8466E-01	3.757E+00	1.163E-02
1.139931E+02	8.37293E+01	2.2471E+00	3.9690E+00	2.6365E-01	3.169E+00	1.088E-02
1.218587E+02	8.39284E+01	2.0183E+00	3.3347E+00	2.4473E-01	2.670E+00	1.017E-02
1.302669E+02	8.40613E+01	1.8124E+00	2.8013E+00	2.2767E-01	2.250E+00	9.518E-03
1.392553E+02	8.41518E+01	1.6250E+00	2.3495E+00	2.1230E-01	1.891E+00	8.903E-03
1.488640E+02	8.42113E+01	1.4564E+00	1.9699E+00	1.9843E-01	1.589E+00	8.329E-03
1.591356E+02	8.42495E+01	1.3053E+00	1.6515E+00	1.8590E-01	1.334E+00	7.791E-03
1.701159E+02	8.42724E+01	1.1699E+00	1.3847E+00	1.7458E-01	1.120E+00	7.288E-03
1.818539E+02	8.42843E+01	1.0486E+00	1.1610E+00	1.6432E-01	9.409E-01	6.818E-03
1.944018E+02	8.42882E+01	9.4004E-01	9.7360E-01	1.5500E-01	7.901E-01	6.378E-03
2.078156E+02	8.42862E+01	8.4258E-01	8.1633E-01	1.4653E-01	6.632E-01	5.966E-03
2.221548E+02	8.42799E+01	7.5532E-01	6.8455E-01	1.3881E-01	5.568E-01	5.581E-03
2.374835E+02	8.42706E+01	6.7716E-01	5.7411E-01	1.3174E-01	4.674E-01	5.221E-03
2.538699E+02	8.42592E+01	6.0716E-01	4.8153E-01	1.2526E-01	3.924E-01	4.884E-03
2.713869E+02	8.42465E+01	5.4445E-01	4.0392E-01	1.1929E-01	3.294E-01	4.569E-03
2.901126E+02	8.42330E+01	4.8826E-01	3.3886E-01	1.1377E-01	2.765E-01	4.274E-03
3.101304E+02	8.42192E+01	4.3791E-01	2.8430E-01	1.0865E-01	2.321E-01	3.998E-03
3.315294E+02	8.42053E+01	3.9279E-01	2.3855E-01	1.0389E-01	1.949E-01	3.740E-03
3.544049E+02	8.41915E+01	3.5235E-01	2.0018E-01	9.9433E-02	1.636E-01	3.498E-03
3.788588E+02	8.41781E+01	3.1610E-01	1.6799E-01	9.5253E-02	1.373E-01	3.273E-03
4.050001E+02	8.41651E+01	2.8361E-01	1.4099E-01	9.1316E-02	1.153E-01	3.061E-03
4.329451E+02	8.41527E+01	2.5447E-01	1.1834E-01	8.7594E-02	9.678E-02	2.864E-03





At Z = 85

Atomic weight = 2.10000E+02 g/mol, nominal density ρ (g/cm³) = 1.0000E+00 μ_a (barns/atom) = μ (cm²/g) \times 3.48713E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 2.00382E+05

24 edges. Edge energies (keV):

K		9.57299E+00	L	I	1.74930E+00	L	II	1.67847E+00	L	III	1.42135E+01
M	I	4.31700E+00	M	II	4.00800E+00	M	III	3.42600E+00	M	IV	2.90870E+00
M	IV	2.78670E+00	N	I	1.04200E+00	N	II	8.86000E-00	N	III	7.40000E-01
N	IV	5.33200E-00	N	V	4.75385E-00	N	VI	1.97076E-00	N	VII	1.90577E-01
O	I	1.85617E-00	O	II	1.38499E-00	O	III	1.08426E-00	O	IV	4.15942E-02
O	V	3.76618E-02	P	I	1.93390E-02	P	II	9.03104E-03	P	III	6.24450E-03

Relativistic correction estimate f_{rel} (H82.3/5CL) = -2.0891E+00, -1.2198E+00 e/atomNuclear Thomson correction f_{NT} = -1.8874E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	$\mu\kappa$ cm ² /g	λ nm
6.119614E-03	-2.41657E-01	0.0000E+00	0.0000E+00	1.0124E-05	0.000E+00	2.026E+02
6.213281E-03	-2.69168E+00	0.0000E+00	0.0000E+00	1.0994E-05	0.000E+00	1.995E+02
6.238259E-03	5.59099E+00	0.0000E+00	0.0000E+00	1.1236E-05	0.000E+00	1.987E+02
6.275726E-03	-2.60900E+00	5.6874E+00	1.8160E+05	1.1605E-05	0.000E+00	1.976E+02
6.369394E-03	-2.10624E-02	5.5961E+00	1.7605E+05	1.2571E-05	0.000E+00	1.947E+02
8.850419E-03	2.63911E+00	4.0899E+00	9.2600E+04	6.9174E-05	0.000E+00	1.401E+02
8.985884E-03	9.21561E-01	4.0368E+00	9.0020E+04	7.4605E-05	0.000E+00	1.380E+02
9.022009E-03	-1.18057E+00	4.0229E+00	8.9349E+04	7.6105E-05	0.000E+00	1.374E+02
9.076195E-03	1.00680E+00	8.1650E+00	1.8027E+05	7.8399E-05	0.000E+00	1.366E+02
9.211660E-03	2.96014E+00	8.0974E+00	1.7614E+05	8.4358E-05	0.000E+00	1.346E+02
1.069000E-02	6.82483E+00	7.4081E+00	1.3886E+05	1.7357E-04	0.000E+00	1.160E+02
1.142761E-02	7.64511E+00	7.0693E+00	1.2396E+05	2.3782E-04	0.000E+00	1.085E+02
1.221612E-02	8.30377E+00	6.7047E+00	1.0998E+05	3.2416E-04	0.000E+00	1.015E+02
1.305903E-02	8.83986E+00	6.3150E+00	9.6900E+04	4.3954E-04	0.000E+00	9.494E+01
1.396010E-02	9.26885E+00	5.9041E+00	8.4748E+04	5.9291E-04	0.000E+00	8.881E+01
1.492335E-02	9.59618E+00	5.4778E+00	7.3553E+04	7.9571E-04	0.000E+00	8.308E+01
1.595306E-02	9.82142E+00	5.0430E+00	6.3344E+04	1.0624E-03	0.000E+00	7.772E+01
1.705382E-02	9.93647E+00	4.6073E+00	5.4135E+04	1.4113E-03	0.000E+00	7.270E+01
1.823053E-02	9.90480E+00	4.1779E+00	4.5921E+04	1.8654E-03	0.000E+00	6.801E+01
1.895220E-02	9.72269E+00	3.9337E+00	4.1591E+04	2.1890E-03	0.000E+00	6.542E+01
1.924229E-02	9.43058E+00	3.8396E+00	3.9984E+04	2.3294E-03	0.000E+00	6.443E+01
1.931964E-02	9.06984E+00	3.8149E+00	3.9568E+04	2.3678E-03	0.000E+00	6.418E+01
1.943568E-02	9.46307E+00	4.4914E+00	4.6307E+04	2.4263E-03	0.000E+00	6.379E+01
1.948844E-02	9.56904E+00	4.4669E+00	4.5929E+04	2.4532E-03	0.000E+00	6.362E+01
1.972576E-02	9.80054E+00	4.3587E+00	4.4278E+04	2.5768E-03	0.000E+00	6.285E+01
2.083314E-02	1.00552E+01	3.8991E+00	3.7503E+04	3.2102E-03	0.000E+00	5.951E+01
2.227063E-02	9.99527E+00	3.3974E+00	3.0568E+04	4.1799E-03	0.000E+00	5.567E+01
2.380730E-02	9.75723E+00	2.9578E+00	2.4895E+04	5.4159E-03	0.000E+00	5.208E+01
2.545001E-02	9.38258E+00	2.5720E+00	2.0251E+04	6.9829E-03	0.000E+00	4.872E+01
2.720606E-02	8.87291E+00	2.2342E+00	1.6456E+04	8.9597E-03	0.000E+00	4.557E+01
2.908327E-02	8.21025E+00	1.9390E+00	1.3359E+04	1.1441E-02	0.000E+00	4.263E+01
3.109002E-02	7.35213E+00	1.6817E+00	1.0839E+04	1.4538E-02	0.000E+00	3.988E+01
3.323523E-02	6.21609E+00	1.4583E+00	8.7922E+03	1.8387E-02	0.000E+00	3.731E+01
3.552846E-02	4.61874E+00	1.2649E+00	7.1340E+03	2.3144E-02	0.000E+00	3.490E+01
3.690857E-02	3.28524E+00	1.1666E+00	6.3335E+03	2.6338E-02	0.000E+00	3.359E+01
3.747350E-02	2.46771E+00	1.1297E+00	6.0409E+03	2.7719E-02	0.000E+00	3.309E+01
3.762415E-02	2.01636E+00	1.1202E+00	5.9660E+03	2.8095E-02	0.000E+00	3.295E+01
3.785012E-02	1.99677E+00	1.6773E+00	8.8799E+03	2.8664E-02	0.000E+00	3.276E+01
3.797993E-02	1.92704E+00	1.7019E+00	8.9791E+03	2.8994E-02	0.000E+00	3.264E+01
3.841505E-02	1.54296E+00	1.7979E+00	9.3782E+03	3.0117E-02	0.000E+00	3.227E+01
4.060054E-02	-1.22929E+00	2.7299E+00	1.3473E+04	3.6153E-02	0.000E+00	3.054E+01
4.076232E-02	-1.47646E+00	2.8398E+00	1.3960E+04	3.6627E-02	0.000E+00	3.042E+01
4.138623E-02	-2.54627E+00	3.3371E+00	1.6157E+04	3.8486E-02	0.000E+00	2.996E+01
4.155261E-02	-2.98891E+00	3.4911E+00	1.6835E+04	3.8991E-02	0.000E+00	2.984E+01
4.180217E-02	-3.18942E+00	4.1313E+00	1.9804E+04	3.9757E-02	0.000E+00	2.966E+01
4.242608E-02	-3.93531E+00	4.9135E+00	2.3207E+04	4.1708E-02	0.000E+00	2.922E+01
4.340198E-02	-5.16803E+00	6.3762E+00	2.9438E+04	4.4871E-02	0.000E+00	2.857E+01
4.639671E-02	-7.92998E+00	1.2625E+01	5.4527E+04	5.5434E-02	0.000E+00	2.672E+01
4.959809E-02	-7.50469E+00	2.1002E+01	8.4849E+04	6.8169E-02	0.000E+00	2.500E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 589

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
5.302035E-02	-2.81212E+00	2.9113E+01	1.1003E+05	8.3449E-02	0.000E+00	2.338E+01
5.667876E-02	5.29944E+00	3.4450E+01	1.2180E+05	1.0169E-01	0.000E+00	2.187E+01
6.058959E-02	1.46343E+01	3.5751E+01	1.1824E+05	1.2336E-01	0.000E+00	2.046E+01
6.477028E-02	2.29647E+01	3.3389E+01	1.0330E+05	1.4898E-01	0.000E+00	1.914E+01
6.923942E-02	2.89886E+01	2.8736E+01	8.3163E+04	1.7913E-01	0.000E+00	1.791E+01
7.401695E-02	3.24658E+01	2.3282E+01	6.3030E+04	2.1442E-01	0.000E+00	1.675E+01
7.912411E-02	3.38329E+01	1.8092E+01	4.5819E+04	2.5555E-01	0.000E+00	1.567E+01
8.458368E-02	3.37493E+01	1.3704E+01	3.2464E+04	3.0324E-01	0.000E+00	1.466E+01
9.041995E-02	3.28061E+01	1.0255E+01	2.2725E+04	3.5828E-01	0.000E+00	1.371E+01
9.665893E-02	3.14073E+01	7.6660E+00	1.5892E+04	4.2150E-01	0.000E+00	1.283E+01
1.033284E-01	2.96988E+01	5.7761E+00	1.1201E+04	4.9376E-01	0.000E+00	1.200E+01
1.062575E-01	2.87473E+01	5.1509E+00	9.7138E+03	5.2693E-01	0.000E+00	1.167E+01
1.078839E-01	2.77849E+01	4.8460E+00	9.0010E+03	5.4571E-01	0.000E+00	1.149E+01
1.083176E-01	2.69110E+01	4.7693E+00	8.8230E+03	5.5077E-01	0.000E+00	1.145E+01
1.089681E-01	2.76345E+01	6.2229E+00	1.1443E+04	5.5838E-01	0.000E+00	1.138E+01
1.104581E-01	2.80662E+01	5.9294E+00	1.0757E+04	5.7596E-01	0.000E+00	1.122E+01
1.105945E-01	2.80768E+01	5.9037E+00	1.0697E+04	5.7758E-01	0.000E+00	1.121E+01
1.180797E-01	2.75554E+01	4.7243E+00	8.0171E+03	6.6903E-01	0.000E+00	1.050E+01
1.262272E-01	2.65188E+01	3.8450E+00	6.1038E+03	7.7390E-01	0.000E+00	9.822E+00
1.349368E-01	2.52183E+01	3.2157E+00	4.7754E+03	8.9151E-01	0.000E+00	9.188E+00
1.357294E-01	2.50570E+01	3.1698E+00	4.6797E+03	9.0247E-01	0.000E+00	9.135E+00
1.378069E-01	2.43871E+01	3.0565E+00	4.4444E+03	9.3140E-01	0.000E+00	8.997E+00
1.383609E-01	2.37735E+01	3.0280E+00	4.3853E+03	9.3916E-01	0.000E+00	8.961E+00
1.391919E-01	2.42878E+01	4.0882E+00	5.8855E+03	9.5083E-01	0.000E+00	8.907E+00
1.412694E-01	2.46047E+01	3.9450E+00	5.5958E+03	9.8021E-01	0.000E+00	8.776E+00
1.442475E-01	2.45940E+01	3.7579E+00	5.2203E+03	1.0228E+00	0.000E+00	8.595E+00
1.542005E-01	2.40093E+01	3.2571E+00	4.2326E+03	1.1686E+00	0.000E+00	8.040E+00
1.648404E-01	2.31583E+01	2.8777E+00	3.4982E+03	1.3298E+00	0.000E+00	7.521E+00
1.762144E-01	2.21143E+01	2.5933E+00	2.9490E+03	1.5072E+00	0.000E+00	7.036E+00
1.819046E-01	2.15086E+01	2.4850E+00	2.7375E+03	1.5975E+00	0.000E+00	6.816E+00
1.846888E-01	2.11439E+01	2.4386E+00	2.6458E+03	1.6421E+00	0.000E+00	6.713E+00
1.854313E-01	2.09843E+01	2.4268E+00	2.6225E+03	1.6540E+00	0.000E+00	6.686E+00
1.865450E-01	2.09282E+01	2.5574E+00	2.7471E+03	1.6719E+00	0.000E+00	6.646E+00
1.867657E-01	2.09114E+01	2.5542E+00	2.7405E+03	1.6755E+00	0.000E+00	6.638E+00
1.883732E-01	2.07458E+01	2.5320E+00	2.6934E+03	1.7014E+00	0.000E+00	6.582E+00
1.893292E-01	2.06186E+01	2.5193E+00	2.6664E+03	1.7168E+00	0.000E+00	6.549E+00
1.896243E-01	2.05723E+01	2.5155E+00	2.6582E+03	1.7216E+00	0.000E+00	6.538E+00
1.903866E-01	2.03960E+01	2.5057E+00	2.6373E+03	1.7339E+00	0.000E+00	6.512E+00
1.915301E-01	2.03563E+01	2.6836E+00	2.8077E+03	1.7524E+00	0.000E+00	6.473E+00
1.931341E-01	2.02266E+01	2.6841E+00	2.7848E+03	1.7785E+00	0.000E+00	6.420E+00
1.943887E-01	2.00964E+01	2.6863E+00	2.7691E+03	1.7989E+00	0.000E+00	6.378E+00
1.960902E-01	1.98840E+01	2.6921E+00	2.7510E+03	1.8266E+00	0.000E+00	6.323E+00
1.968785E-01	1.97317E+01	2.6959E+00	2.7439E+03	1.8395E+00	0.000E+00	6.297E+00
1.980610E-01	1.96674E+01	2.8430E+00	2.8763E+03	1.8588E+00	0.000E+00	6.260E+00
2.010171E-01	1.93973E+01	2.8950E+00	2.8859E+03	1.9072E+00	0.000E+00	6.168E+00
2.013709E-01	1.93611E+01	2.9023E+00	2.8881E+03	1.9130E+00	0.000E+00	6.157E+00
2.152655E-01	1.77779E+01	3.4011E+00	3.1659E+03	2.1426E+00	0.000E+00	5.760E+00
2.301188E-01	1.60180E+01	4.4301E+00	3.8576E+03	2.3903E+00	0.000E+00	5.388E+00
2.459970E-01	1.42798E+01	6.0819E+00	4.9541E+03	2.6564E+00	0.000E+00	5.040E+00
2.629708E-01	1.27910E+01	8.3924E+00	6.3949E+03	2.9408E+00	0.000E+00	4.715E+00
2.811158E-01	1.17914E+01	1.1290E+01	8.0476E+03	3.2432E+00	0.000E+00	4.410E+00
3.005128E-01	1.14749E+01	1.4601E+01	9.7359E+03	3.5633E+00	0.000E+00	4.126E+00
3.212482E-01	1.19469E+01	1.8085E+01	1.1281E+04	3.9003E+00	0.000E+00	3.859E+00
3.434143E-01	1.32036E+01	2.1484E+01	1.2536E+04	4.2533E+00	0.000E+00	3.610E+00
3.671099E-01	1.51565E+01	2.4568E+01	1.3410E+04	4.6212E+00	0.000E+00	3.377E+00
3.924405E-01	1.76291E+01	2.7162E+01	1.3869E+04	5.0026E+00	0.000E+00	3.159E+00
4.195189E-01	2.03878E+01	2.9159E+01	1.3928E+04	5.3959E+00	0.000E+00	2.955E+00
4.484657E-01	2.30912E+01	3.0520E+01	1.3637E+04	5.7992E+00	0.000E+00	2.765E+00
4.658769E-01	2.42237E+01	3.1015E+01	1.3340E+04	6.0331E+00	0.000E+00	2.661E+00
4.730077E-01	2.40570E+01	3.1157E+01	1.3199E+04	6.1270E+00	0.000E+00	2.621E+00
4.749092E-01	2.32562E+01	3.1189E+01	1.3160E+04	6.1518E+00	0.000E+00	2.611E+00
4.777615E-01	2.44648E+01	3.3142E+01	1.3900E+04	6.1890E+00	0.000E+00	2.595E+00
4.794098E-01	2.49260E+01	3.3180E+01	1.3868E+04	6.2104E+00	0.000E+00	2.586E+00
4.848923E-01	2.59263E+01	3.3297E+01	1.3760E+04	6.2811E+00	0.000E+00	2.557E+00
5.124891E-01	2.90018E+01	3.3657E+01	1.3160E+04	6.6273E+00	0.000E+00	2.419E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
5.225360E-01	2.97833E+01	3.3707E+01	1.2926E+04	6.7493E+00	0.000E+00	2.373E+00
5.305340E-01	3.00394E+01	3.3721E+01	1.2736E+04	6.8449E+00	0.000E+00	2.337E+00
5.326668E-01	2.96400E+01	3.3720E+01	1.2685E+04	6.8702E+00	0.000E+00	2.328E+00
5.358660E-01	3.05179E+01	3.4888E+01	1.3046E+04	6.9079E+00	0.000E+00	2.314E+00
5.438640E-01	3.17485E+01	3.4906E+01	1.2861E+04	7.0013E+00	0.000E+00	2.280E+00
5.478508E-01	3.22192E+01	3.4908E+01	1.2768E+04	7.0474E+00	0.000E+00	2.263E+00
5.856525E-01	3.58579E+01	3.4711E+01	1.1876E+04	7.4681E+00	0.000E+00	2.117E+00
6.260625E-01	3.89315E+01	3.4173E+01	1.0938E+04	7.8867E+00	0.000E+00	1.980E+00
6.692609E-01	4.15860E+01	3.3341E+01	9.9825E+03	8.3004E+00	0.000E+00	1.853E+00
7.154399E-01	4.35587E+01	3.2291E+01	9.0442E+03	8.7063E+00	0.000E+00	1.733E+00
7.252000E-01	4.37371E+01	3.2059E+01	8.8583E+03	8.7875E+00	0.000E+00	1.710E+00
7.363000E-01	4.34032E+01	3.1793E+01	8.6524E+03	8.8780E+00	0.000E+00	1.684E+00
7.392600E-01	4.25241E+01	3.1722E+01	8.5984E+03	8.9018E+00	0.000E+00	1.677E+00
7.437000E-01	4.37519E+01	3.3607E+01	9.0551E+03	8.9372E+00	0.000E+00	1.667E+00
7.548000E-01	4.51391E+01	3.3345E+01	8.8524E+03	9.0244E+00	0.000E+00	1.643E+00
7.648052E-01	4.59096E+01	3.3109E+01	8.6747E+03	9.1014E+00	0.000E+00	1.621E+00
8.175768E-01	4.87500E+01	3.1835E+01	7.8026E+03	9.4829E+00	0.000E+00	1.516E+00
8.682800E-01	5.06396E+01	3.0555E+01	7.0515E+03	9.8129E+00	0.000E+00	1.428E+00
8.739896E-01	5.07932E+01	3.0415E+01	6.9733E+03	9.8479E+00	0.000E+00	1.419E+00
8.815700E-01	5.09266E+01	3.0230E+01	6.8713E+03	9.8938E+00	0.000E+00	1.406E+00
8.851140E-01	5.08362E+01	3.0144E+01	6.8244E+03	9.9150E+00	0.000E+00	1.401E+00
8.904300E-01	5.12249E+01	3.0430E+01	6.8480E+03	9.9465E+00	0.000E+00	1.392E+00
9.037200E-01	5.18414E+01	3.0117E+01	6.6779E+03	1.0024E+01	0.000E+00	1.372E+00
9.342948E-01	5.28943E+01	2.9388E+01	6.3031E+03	1.0194E+01	0.000E+00	1.327E+00
9.887612E-01	5.47086E+01	2.7969E+01	5.6115E+03	1.0517E+01	0.000E+00	1.241E+00
1.021160E+00	5.54917E+01	2.7224E+01	5.3421E+03	1.0620E+01	0.000E+00	1.214E+00
1.036790E+00	5.57138E+01	2.6716E+01	5.1635E+03	1.0688E+01	0.000E+00	1.196E+00
1.040958E+00	5.55416E+01	2.6584E+01	5.1174E+03	1.0706E+01	0.000E+00	1.191E+00
1.047210E+00	5.59887E+01	2.6937E+01	5.1543E+03	1.0733E+01	0.000E+00	1.184E+00
1.062840E+00	5.65721E+01	2.6463E+01	4.9893E+03	1.0797E+01	0.000E+00	1.167E+00
1.067676E+00	5.67045E+01	2.6321E+01	4.9399E+03	1.0817E+01	0.000E+00	1.161E+00
1.141345E+00	5.80328E+01	2.4339E+01	4.2732E+03	1.1089E+01	0.000E+00	1.086E+00
1.220998E+00	5.88437E+01	2.2561E+01	3.7054E+03	1.1333E+01	0.000E+00	1.016E+00
1.304285E+00	5.93770E+01	2.0945E+01	3.2179E+03	1.1547E+01	0.000E+00	9.506E-01
1.394281E+00	5.96899E+01	1.9476E+01	2.7990E+03	1.1728E+01	0.000E+00	8.892E-01
1.490486E+00	5.98374E+01	1.8146E+01	2.4395E+03	1.1875E+01	0.000E+00	8.318E-01
1.593329E+00	5.98041E+01	1.6929E+01	2.1290E+03	1.1989E+01	0.000E+00	7.781E-01
1.703269E+00	5.96146E+01	1.5824E+01	1.8616E+03	1.2067E+01	0.000E+00	7.279E-01
1.820795E+00	5.92171E+01	1.4822E+01	1.6311E+03	1.2110E+01	0.000E+00	6.809E-01
1.946430E+00	5.85865E+01	1.3869E+01	1.4278E+03	1.2117E+01	0.000E+00	6.370E-01
2.080733E+00	5.75639E+01	1.2928E+01	1.2450E+03	1.2090E+01	0.000E+00	5.959E-01
2.224304E+00	5.59360E+01	1.2014E+01	1.0873E+03	1.2028E+01	0.000E+00	5.574E-01
2.377781E+00	5.31863E+01	1.1155E+01	9.4008E+02	1.1932E+01	0.000E+00	5.214E-01
2.541848E+00	4.78599E+01	1.0373E+01	8.1774E+02	1.1805E+01	0.000E+00	4.878E-01
2.717233E+00	3.01979E+01	9.6784E+00	7.1220E+02	1.1646E+01	0.000E+00	4.563E-01
2.730966E+00	2.63900E+01	9.6070E+00	7.0491E+02	1.1633E+01	0.000E+00	4.540E-01
2.772767E+00	-2.73934E+00	9.4541E+00	6.8323E+02	1.1592E+01	0.000E+00	4.471E-01
2.783913E+00	-4.68104E+01	9.4143E+00	6.7763E+02	1.1581E+01	0.000E+00	4.454E-01
2.800634E+00	2.10252E+01	9.5890E+01	6.8608E+03	1.1564E+01	0.000E+00	4.427E-01
2.842434E+00	5.93051E+01	5.6725E+01	3.9990E+03	1.1522E+01	0.000E+00	4.362E-01
2.850526E+00	5.99684E+01	5.1535E+01	3.6227E+03	1.1514E+01	0.000E+00	4.350E-01
2.894156E+00	4.40220E+01	3.1943E+01	2.2116E+03	1.1469E+01	0.000E+00	4.284E-01
2.904724E+00	2.08895E+01	2.8768E+01	1.9846E+03	1.1458E+01	0.000E+00	4.268E-01
2.905791E+00	1.46188E+01	2.8473E+01	1.9635E+03	1.1457E+01	0.000E+00	4.267E-01
2.923243E+00	6.12934E+01	7.8102E+01	5.3537E+03	1.1438E+01	0.000E+00	4.241E-01
2.966874E+00	7.60444E+01	4.4314E+01	2.9930E+03	1.1392E+01	0.000E+00	4.179E-01
3.105150E+00	6.20899E+01	3.4042E+01	2.1968E+03	1.1242E+01	0.000E+00	3.993E-01
3.319406E+00	6.56563E+01	3.7053E+01	2.2368E+03	1.1001E+01	0.000E+00	3.735E-01
3.357480E+00	6.68667E+01	3.6859E+01	2.1998E+03	1.0958E+01	0.000E+00	3.693E-01
3.408870E+00	6.71633E+01	3.5892E+01	2.1098E+03	1.0899E+01	0.000E+00	3.637E-01
3.422574E+00	6.52962E+01	3.5565E+01	2.0822E+03	1.0883E+01	0.000E+00	3.623E-01
3.443130E+00	6.85417E+01	3.9796E+01	2.3161E+03	1.0859E+01	0.000E+00	3.601E-01
3.494520E+00	7.24184E+01	3.8134E+01	2.1867E+03	1.0800E+01	0.000E+00	3.548E-01
3.548445E+00	7.46284E+01	3.6239E+01	2.0464E+03	1.0737E+01	0.000E+00	3.494E-01
3.793288E+00	7.86586E+01	2.6656E+01	1.4081E+03	1.0452E+01	0.000E+00	3.269E-01

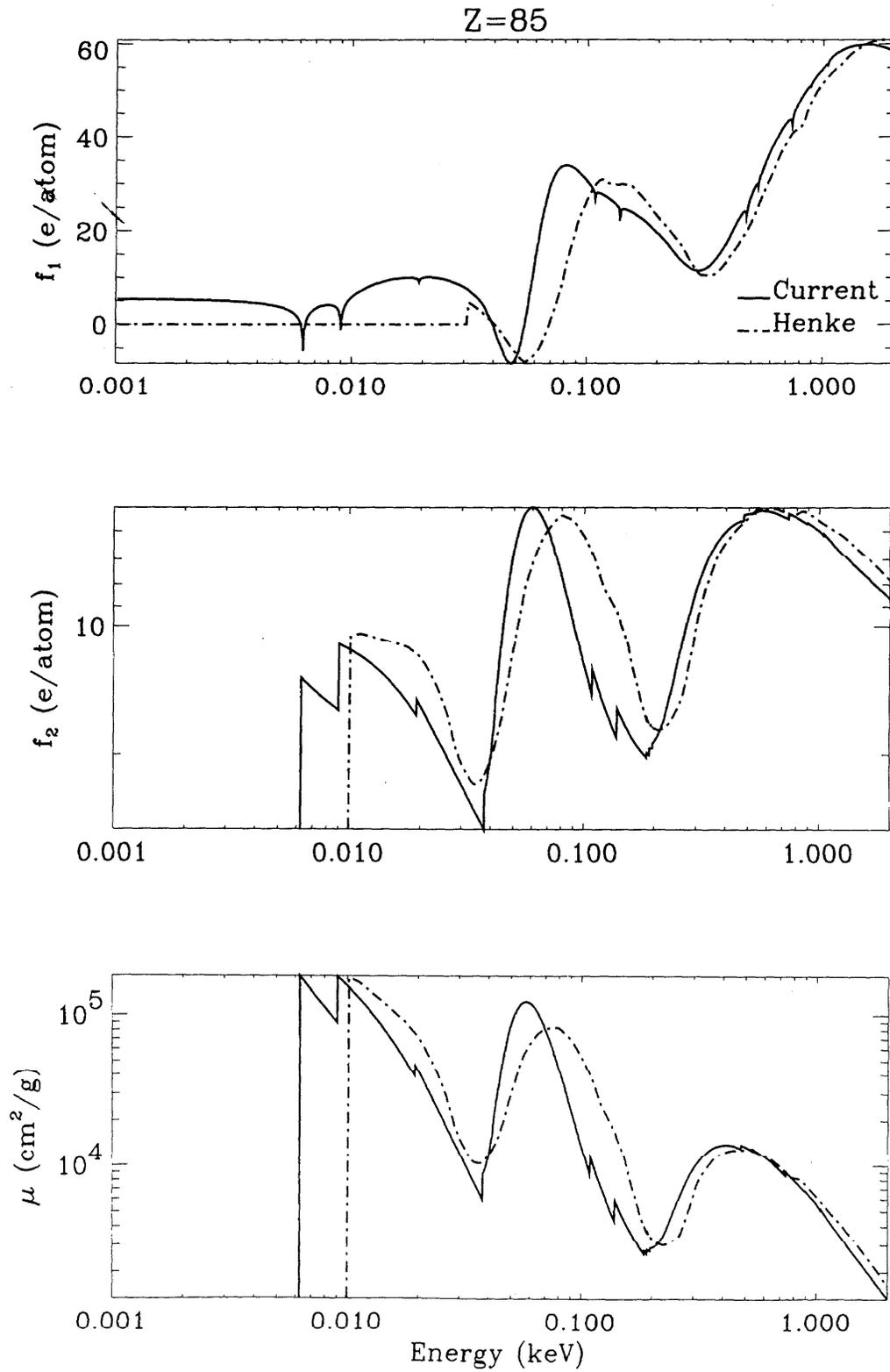
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 591

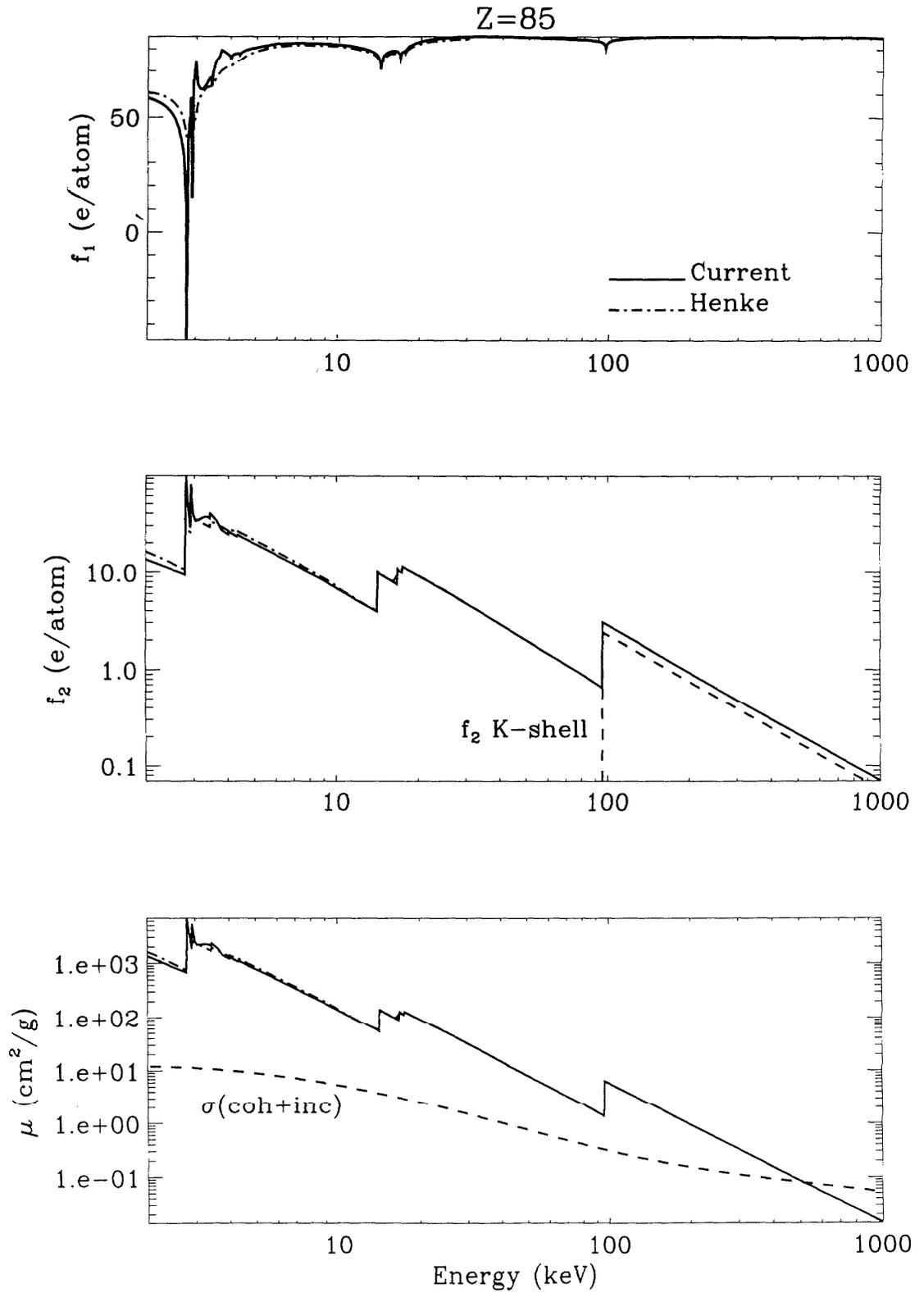
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
3.927840E+00	7.74498E+01	2.5182E+01	1.2847E+03	1.0295E+01	0.000E+00	3.157E-01
3.987960E+00	7.66604E+01	2.4575E+01	1.2348E+03	1.0226E+01	0.000E+00	3.109E-01
4.003992E+00	7.57684E+01	2.4418E+01	1.2220E+03	1.0207E+01	0.000E+00	3.097E-01
4.028040E+00	7.66793E+01	2.5934E+01	1.2901E+03	1.0179E+01	0.000E+00	3.078E-01
4.055024E+00	7.71815E+01	2.5648E+01	1.2674E+03	1.0148E+01	0.000E+00	3.058E-01
4.088160E+00	7.75008E+01	2.5305E+01	1.2403E+03	1.0110E+01	0.000E+00	3.033E-01
4.230660E+00	7.79962E+01	2.3935E+01	1.1337E+03	9.9464E+00	0.000E+00	2.931E-01
4.295415E+00	7.77907E+01	2.3388E+01	1.0911E+03	9.8727E+00	0.000E+00	2.886E-01
4.312683E+00	7.73233E+01	2.3247E+01	1.0801E+03	9.8531E+00	0.000E+00	2.875E-01
4.334821E+00	7.78613E+01	2.4103E+01	1.1142E+03	9.8280E+00	0.000E+00	2.860E-01
4.338585E+00	7.79376E+01	2.4073E+01	1.1118E+03	9.8238E+00	0.000E+00	2.858E-01
4.403340E+00	7.86096E+01	2.3568E+01	1.0725E+03	9.7507E+00	0.000E+00	2.816E-01
4.633924E+00	7.96783E+01	2.1898E+01	9.4693E+02	9.4942E+00	0.000E+00	2.676E-01
4.953664E+00	8.05386E+01	1.9929E+01	8.0615E+02	9.1490E+00	0.000E+00	2.503E-01
5.295467E+00	8.11833E+01	1.8158E+01	6.8712E+02	8.7948E+00	0.000E+00	2.341E-01
5.660855E+00	8.18489E+01	1.6501E+01	5.8408E+02	8.4340E+00	0.000E+00	2.190E-01
6.051453E+00	8.22707E+01	1.4912E+01	4.9379E+02	8.0688E+00	0.000E+00	2.049E-01
6.469004E+00	8.24147E+01	1.3475E+01	4.1741E+02	7.7014E+00	0.000E+00	1.917E-01
6.915365E+00	8.25451E+01	1.2193E+01	3.5331E+02	7.3337E+00	0.000E+00	1.793E-01
7.392525E+00	8.25091E+01	1.1032E+01	2.9903E+02	6.9678E+00	0.000E+00	1.677E-01
7.902609E+00	8.24140E+01	9.9994E+00	2.5355E+02	6.6054E+00	0.000E+00	1.569E-01
8.447890E+00	8.23221E+01	9.0714E+00	2.1517E+02	6.2481E+00	0.000E+00	1.468E-01
9.030794E+00	8.22117E+01	8.2073E+00	1.8211E+02	5.8975E+00	0.000E+00	1.373E-01
9.653919E+00	8.19647E+01	7.3369E+00	1.5229E+02	5.5548E+00	0.000E+00	1.284E-01
1.032004E+01	8.16115E+01	6.5680E+00	1.2753E+02	5.2211E+00	0.000E+00	1.201E-01
1.103212E+01	8.11566E+01	5.8878E+00	1.0694E+02	4.8976E+00	0.000E+00	1.124E-01
1.179334E+01	8.05644E+01	5.2868E+00	8.9828E+01	4.5851E+00	0.000E+00	1.051E-01
1.260708E+01	7.97232E+01	4.7459E+00	7.5433E+01	4.2841E+00	0.000E+00	9.834E-02
1.347697E+01	7.81972E+01	4.2563E+00	6.3285E+01	3.9954E+00	0.000E+00	9.200E-02
1.392923E+01	7.63888E+01	4.0362E+00	5.8063E+01	3.8573E+00	0.000E+00	8.901E-02
1.414243E+01	7.37593E+01	3.9386E+00	5.5806E+01	3.7947E+00	0.000E+00	8.767E-02
1.419929E+01	7.06732E+01	3.9133E+00	5.5225E+01	3.7783E+00	0.000E+00	8.732E-02
1.428457E+01	7.37471E+01	9.9118E+00	1.3904E+02	3.7539E+00	0.000E+00	8.680E-02
1.440688E+01	7.57156E+01	9.7728E+00	1.3593E+02	3.7193E+00	0.000E+00	8.606E-02
1.449777E+01	7.64679E+01	9.6715E+00	1.3368E+02	3.6940E+00	0.000E+00	8.552E-02
1.540095E+01	7.89363E+01	8.7318E+00	1.1361E+02	3.4562E+00	0.000E+00	8.050E-02
1.646362E+01	7.86416E+01	7.7790E+00	9.4680E+01	3.2061E+00	0.000E+00	7.531E-02
1.670078E+01	7.74554E+01	7.5881E+00	9.1045E+01	3.1542E+00	0.000E+00	7.424E-02
1.676792E+01	7.59108E+01	7.5353E+00	9.0050E+01	3.1398E+00	0.000E+00	7.394E-02
1.686862E+01	7.74800E+01	1.0515E+01	1.2491E+02	3.1183E+00	0.000E+00	7.350E-02
1.712039E+01	7.88175E+01	1.0261E+01	1.2009E+02	3.0656E+00	0.000E+00	7.242E-02
1.714314E+01	7.88698E+01	1.0238E+01	1.1967E+02	3.0609E+00	0.000E+00	7.232E-02
1.740554E+01	7.89277E+01	9.9842E+00	1.1494E+02	3.0076E+00	0.000E+00	7.123E-02
1.747551E+01	7.82876E+01	9.9178E+00	1.1372E+02	2.9937E+00	0.000E+00	7.095E-02
1.758047E+01	7.92760E+01	1.1370E+01	1.2959E+02	2.9729E+00	0.000E+00	7.052E-02
1.759961E+01	7.94102E+01	1.1351E+01	1.2924E+02	2.9692E+00	0.000E+00	7.045E-02
1.784286E+01	8.04060E+01	1.1116E+01	1.2484E+02	2.9221E+00	0.000E+00	6.949E-02
1.881398E+01	8.21471E+01	1.0243E+01	1.0910E+02	2.7453E+00	0.000E+00	6.590E-02
2.011215E+01	8.32985E+01	9.2187E+00	9.1848E+01	2.5345E+00	0.000E+00	6.165E-02
2.149988E+01	8.40104E+01	8.2961E+00	7.7321E+01	2.3364E+00	0.000E+00	5.767E-02
2.298338E+01	8.44861E+01	7.4647E+00	6.5082E+01	2.1508E+00	0.000E+00	5.395E-02
2.456923E+01	8.48104E+01	6.7170E+00	5.4783E+01	1.9774E+00	0.000E+00	5.046E-02
2.626450E+01	8.50419E+01	6.0480E+00	4.6142E+01	1.8158E+00	0.000E+00	4.721E-02
2.807676E+01	8.52036E+01	5.4145E+00	3.8643E+01	1.6654E+00	0.000E+00	4.416E-02
3.001405E+01	8.53412E+01	4.8312E+00	3.2254E+01	1.5260E+00	0.000E+00	4.131E-02
3.208502E+01	8.53658E+01	4.3129E+00	2.6936E+01	1.3969E+00	0.000E+00	3.864E-02
3.429889E+01	8.53929E+01	3.8515E+00	2.2502E+01	1.2777E+00	0.000E+00	3.615E-02
3.666551E+01	8.53852E+01	3.4298E+00	1.8745E+01	1.1679E+00	0.000E+00	3.381E-02
3.919543E+01	8.53260E+01	3.0538E+00	1.5612E+01	1.0669E+00	0.000E+00	3.163E-02
4.189992E+01	8.52512E+01	2.7210E+00	1.3013E+01	9.7426E-01	0.000E+00	2.959E-02
4.479101E+01	8.51663E+01	2.4264E+00	1.0855E+01	8.8939E-01	0.000E+00	2.768E-02
4.788159E+01	8.50743E+01	2.1653E+00	9.0616E+00	8.1181E-01	0.000E+00	2.589E-02
5.118542E+01	8.49773E+01	1.9337E+00	7.5702E+00	7.4102E-01	0.000E+00	2.422E-02
5.471721E+01	8.48760E+01	1.7282E+00	6.3289E+00	6.7655E-01	0.000E+00	2.266E-02
5.849270E+01	8.47701E+01	1.5457E+00	5.2952E+00	6.1791E-01	0.000E+00	2.120E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.252870E+01	8.46586E+01	1.3827E+00	4.4310E+00	5.6467E-01	0.000E+00	1.983E-02
6.684318E+01	8.45368E+01	1.2356E+00	3.7042E+00	5.1641E-01	0.000E+00	1.855E-02
7.145536E+01	8.43993E+01	1.1052E+00	3.0994E+00	4.7270E-01	0.000E+00	1.735E-02
7.638578E+01	8.42357E+01	9.8789E-01	2.5915E+00	4.3318E-01	0.000E+00	1.623E-02
8.165640E+01	8.40203E+01	8.7854E-01	2.1559E+00	3.9748E-01	0.000E+00	1.518E-02
8.729069E+01	8.36783E+01	7.7724E-01	1.7842E+00	3.6526E-01	0.000E+00	1.420E-02
9.331374E+01	8.28155E+01	6.8813E-01	1.4777E+00	3.3621E-01	0.000E+00	1.329E-02
9.981530E+01	8.26491E+01	6.8145E-01	1.4555E+00	3.3400E-01	0.000E+00	1.322E-02
9.525125E+01	8.16283E+01	6.6290E-01	1.3946E+00	3.2785E-01	0.000E+00	1.302E-02
9.563417E+01	8.04074E+01	6.5809E-01	1.3789E+00	3.2625E-01	0.000E+00	1.296E-02
9.620855E+01	8.16796E+01	3.0533E+00	6.3594E+00	3.2388E-01	5.004E+00	1.289E-02
9.764449E+01	8.27918E+01	2.9843E+00	6.1242E+00	3.1811E-01	4.824E+00	1.270E-02
9.975239E+01	8.34034E+01	2.8871E+00	5.7996E+00	3.1003E-01	4.575E+00	1.243E-02
1.066353E+02	8.42221E+01	2.6010E+00	4.8876E+00	2.8644E-01	3.872E+00	1.163E-02
1.139931E+02	8.46138E+01	2.3399E+00	4.1131E+00	2.6521E-01	3.270E+00	1.088E-02
1.218587E+02	8.48511E+01	2.1028E+00	3.4579E+00	2.4608E-01	2.758E+00	1.017E-02
1.302669E+02	8.50066E+01	1.8893E+00	2.9062E+00	2.2886E-01	2.324E+00	9.518E-03
1.392553E+02	8.51125E+01	1.6961E+00	2.4405E+00	2.1334E-01	1.956E+00	8.903E-03
1.488640E+02	8.51831E+01	1.5209E+00	2.0473E+00	1.9935E-01	1.644E+00	8.329E-03
1.591356E+02	8.52292E+01	1.3638E+00	1.7173E+00	1.8672E-01	1.382E+00	7.791E-03
1.701159E+02	8.52579E+01	1.2230E+00	1.4406E+00	1.7530E-01	1.161E+00	7.288E-03
1.818539E+02	8.52741E+01	1.0968E+00	1.2086E+00	1.6497E-01	9.754E-01	6.818E-03
1.944018E+02	8.52812E+01	9.8376E-01	1.0140E+00	1.5559E-01	8.194E-01	6.378E-03
2.078156E+02	8.52817E+01	8.8244E-01	8.5087E-01	1.4707E-01	6.884E-01	5.966E-03
2.221548E+02	8.52773E+01	7.9163E-01	7.1405E-01	1.3930E-01	5.783E-01	5.581E-03
2.374835E+02	8.52695E+01	7.1025E-01	5.9929E-01	1.3220E-01	4.858E-01	5.221E-03
2.538699E+02	8.52593E+01	6.3731E-01	5.0303E-01	1.2569E-01	4.081E-01	4.884E-03
2.713869E+02	8.52474E+01	5.7192E-01	4.2228E-01	1.1970E-01	3.429E-01	4.569E-03
2.901126E+02	8.52346E+01	5.1329E-01	3.5453E-01	1.1417E-01	2.880E-01	4.274E-03
3.101304E+02	8.52212E+01	4.6072E-01	2.9768E-01	1.0904E-01	2.420E-01	3.998E-03
3.315294E+02	8.52076E+01	4.1357E-01	2.4997E-01	1.0427E-01	2.033E-01	3.740E-03
3.544049E+02	8.51941E+01	3.7129E-01	2.0993E-01	9.9813E-02	1.708E-01	3.498E-03
3.788588E+02	8.51808E+01	3.3336E-01	1.7632E-01	9.5633E-02	1.435E-01	3.273E-03
4.050001E+02	8.51679E+01	2.9933E-01	1.4810E-01	9.1699E-02	1.205E-01	3.061E-03
4.329451E+02	8.51555E+01	2.6880E-01	1.2441E-01	8.7981E-02	1.012E-01	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 595

Rn Z = 86

Atomic weight = 2.220000E+02 g/mol, nominal density ρ (g/cm³) = 9.2300E-04

μ_0 (barns/atom) = $\mu_0(\text{cm}^2/\text{g}) \times 3.68640\text{E}+02$, E (eV) $\mu_0(\text{cm}^2/\text{g}) = f_2(\text{e}/\text{atom}) \times 1.89551\text{E}+05$

14 edges. Edge energies (keV):

K		9.84040E+00	L	I	1.80490E+00	L	II	1.73371E+00	L	III	1.46194E+01
M	I	4.48200E+00	M	II	4.15900E+00	M	III	3.53800E+00	M	IV	3.02150E+00
M	V	2.89240E+00	N	I	1.09700E+00	N	II	9.29000E-00	N	III	7.68000E-01
N	IV	5.66600E-00	N	V	5.37000E-00	N	VI	2.19631E-00	N	VII	2.12588E-01
O	I	2.00831E-00	O	II	1.51771E-00	O	III	1.18817E-00	O	IV	4.86911E-02
O	V	4.42550E-02	P	I	2.19397E-02	P	II	1.05726E-02	P	III	7.12588E-03

Relativistic correction estimate f_{rel} (H82.3/SCL) = -2.1548E+00, -1.2570E+00 e/atom

Nuclear Thomson correction f_{NT} = -1.8276E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.983358E-03	-1.40095E-01	0.0000E+00	0.0000E+00	1.7617E-05	0.000E+00	1.775E+02
7.090247E-03	-3.65878E+00	0.0000E+00	0.0000E+00	1.9096E-05	0.000E+00	1.749E+02
7.118750E-03	-7.81185E+00	0.0000E+00	0.0000E+00	1.9506E-05	0.000E+00	1.742E+02
7.161505E-03	-3.56804E+00	8.1423E+00	2.1551E+05	2.0133E-05	0.000E+00	1.731E+02
7.268393E-03	1.18324E-01	8.0559E+00	2.1009E+05	2.1769E-05	0.000E+00	1.706E+02
1.036116E-02	5.66085E+00	6.1586E+00	1.1267E+05	1.3039E-04	0.000E+00	1.197E+02
1.051975E-02	3.81936E+00	6.0731E+00	1.0943E+05	1.4031E-04	0.000E+00	1.179E+02
1.056204E-02	1.52197E+00	6.0503E+00	1.0858E+05	1.4304E-04	0.000E+00	1.174E+02
1.062547E-02	3.94006E+00	1.0589E+01	1.8890E+05	1.4722E-04	0.000E+00	1.167E+02
1.069000E-02	5.17172E+00	1.0549E+01	1.8705E+05	1.5156E-04	0.000E+00	1.160E+02
1.078406E-02	6.12627E+00	1.0490E+01	1.8438E+05	1.5806E-04	0.000E+00	1.150E+02
1.142761E-02	8.74822E+00	1.0095E+01	1.6745E+05	2.0820E-04	0.000E+00	1.085E+02
1.221612E-02	1.02947E+01	9.6193E+00	1.4926E+05	2.8449E-04	0.000E+00	1.015E+02
1.305903E-02	1.14147E+01	9.1051E+00	1.3216E+05	3.8671E-04	0.000E+00	9.494E+01
1.396010E-02	1.22984E+01	8.5549E+00	1.1616E+05	5.2292E-04	0.000E+00	8.881E+01
1.492335E-02	1.30077E+01	7.9757E+00	1.0130E+05	7.0346E-04	0.000E+00	8.308E+01
1.595306E-02	1.35690E+01	7.3766E+00	8.7647E+04	9.4146E-04	0.000E+00	7.772E+01
1.705382E-02	1.39950E+01	6.7681E+00	7.5226E+04	1.2536E-03	0.000E+00	7.270E+01
1.823053E-02	1.42914E+01	6.1609E+00	6.4058E+04	1.6606E-03	0.000E+00	6.801E+01
1.948844E-02	1.44558E+01	5.5654E+00	5.4131E+04	2.1888E-03	0.000E+00	6.362E+01
2.083314E-02	1.44536E+01	4.9909E+00	4.5409E+04	2.8705E-03	0.000E+00	5.951E+01
2.150088E-02	1.43221E+01	4.7288E+00	4.1689E+04	3.2575E-03	0.000E+00	5.766E+01
2.182997E-02	1.40652E+01	4.6051E+00	3.9986E+04	3.4606E-03	0.000E+00	5.680E+01
2.191773E-02	1.37421E+01	4.5727E+00	3.9546E+04	3.5162E-03	0.000E+00	5.657E+01
2.204937E-02	1.40981E+01	5.1661E+00	4.4411E+04	3.6007E-03	0.000E+00	5.623E+01
2.227063E-02	1.43434E+01	5.0600E+00	4.3067E+04	3.7458E-03	0.000E+00	5.567E+01
2.237846E-02	1.44059E+01	5.0094E+00	4.2431E+04	3.8179E-03	0.000E+00	5.540E+01
2.380730E-02	1.46485E+01	4.3980E+00	3.5016E+04	4.8637E-03	0.000E+00	5.208E+01
2.545001E-02	1.45702E+01	3.8144E+00	2.8410E+04	6.2841E-03	0.000E+00	4.872E+01
2.720606E-02	1.43338E+01	3.3050E+00	2.3027E+04	8.0797E-03	0.000E+00	4.557E+01
2.908327E-02	1.39752E+01	2.8602E+00	1.8642E+04	1.0338E-02	0.000E+00	4.263E+01
3.109002E-02	1.34979E+01	2.4732E+00	1.5078E+04	1.3163E-02	0.000E+00	3.988E+01
3.323523E-02	1.28882E+01	2.1375E+00	1.2191E+04	1.6680E-02	0.000E+00	3.731E+01
3.552846E-02	1.21116E+01	1.8474E+00	9.8560E+03	2.1035E-02	0.000E+00	3.490E+01
3.797993E-02	1.11011E+01	1.5975E+00	7.9729E+03	2.6402E-02	0.000E+00	3.264E+01
4.060054E-02	9.71476E+00	1.3831E+00	6.4573E+03	3.2983E-02	0.000E+00	3.054E+01
4.340198E-02	7.50250E+00	1.1998E+00	5.2397E+03	4.1010E-02	0.000E+00	2.857E+01
4.403377E-02	6.61733E+00	1.1638E+00	5.0097E+03	4.2965E-02	0.000E+00	2.816E+01
4.421079E-02	6.06517E+00	1.1540E+00	4.9477E+03	4.3523E-02	0.000E+00	2.804E+01
4.447632E-02	6.11258E+00	1.9003E+00	8.0988E+03	4.4367E-02	0.000E+00	2.788E+01
4.514014E-02	5.70144E+00	2.0626E+00	8.6612E+03	4.6518E-02	0.000E+00	2.747E+01
4.639671E-02	4.46382E+00	2.5115E+00	1.0260E+04	5.0755E-02	0.000E+00	2.672E+01
4.771733E-02	2.86062E+00	3.2560E+00	1.2934E+04	5.5439E-02	0.000E+00	2.598E+01
4.844769E-02	1.73346E+00	3.8310E+00	1.4989E+04	5.8133E-02	0.000E+00	2.559E+01
4.864246E-02	1.20154E+00	4.0084E+00	1.5620E+04	5.8863E-02	0.000E+00	2.549E+01
4.893461E-02	1.09802E+00	4.8805E+00	1.8905E+04	5.9969E-02	0.000E+00	2.534E+01
4.959809E-02	5.48964E-01	5.7157E+00	2.1844E+04	6.2524E-02	0.000E+00	2.500E+01
4.966497E-02	4.87096E-01	5.8056E+00	2.2158E+04	6.2785E-02	0.000E+00	2.496E+01
5.302035E-02	-1.93666E+00	1.1563E+01	4.1339E+04	7.6669E-02	0.000E+00	2.338E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh}+\text{inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
5.667876E-02	-1.22725E+00	1.9562E+01	6.5421E+04	9.3585E-02	0.000E+00	2.187E+01
6.058959E-02	3.88824E+00	2.6915E+01	8.4201E+04	1.1372E-01	0.000E+00	2.046E+01
6.477028E-02	1.20963E+01	3.0979E+01	9.0662E+04	1.3756E-01	0.000E+00	1.914E+01
6.923942E-02	2.07994E+01	3.0837E+01	8.4419E+04	1.6565E-01	0.000E+00	1.791E+01
7.401695E-02	2.77900E+01	2.7401E+01	7.0172E+04	1.9860E-01	0.000E+00	1.675E+01
7.912411E-02	3.21498E+01	2.2374E+01	5.3600E+04	2.3705E-01	0.000E+00	1.567E+01
8.458368E-02	3.40728E+01	1.7225E+01	3.8601E+04	2.8171E-01	0.000E+00	1.466E+01
9.041995E-02	3.42577E+01	1.2783E+01	2.6797E+04	3.3333E-01	0.000E+00	1.371E+01
9.665893E-02	3.34211E+01	9.3169E+00	1.8271E+04	3.9270E-01	0.000E+00	1.283E+01
1.033284E-01	3.20793E+01	6.7727E+00	1.2424E+04	4.6066E-01	0.000E+00	1.200E+01
1.104581E-01	3.04937E+01	4.9700E+00	8.5288E+03	5.3809E-01	0.000E+00	1.122E+01
1.164403E-01	2.89252E+01	3.9417E+00	6.4166E+03	6.0658E-01	0.000E+00	1.065E+01
1.180797E-01	2.81442E+01	3.7156E+00	5.9646E+03	6.2588E-01	0.000E+00	1.050E+01
1.182225E-01	2.80250E+01	3.6969E+00	5.9273E+03	6.2757E-01	0.000E+00	1.049E+01
1.186978E-01	2.72188E+01	3.6356E+00	5.8057E+03	6.3521E-01	0.000E+00	1.045E+01
1.194107E-01	2.78741E+01	4.9830E+00	7.9100E+03	6.4171E-01	0.000E+00	1.038E+01
1.211929E-01	2.82651E+01	4.7285E+00	7.3955E+03	6.6313E-01	0.000E+00	1.023E+01
1.262272E-01	2.80674E+01	4.1171E+00	6.1826E+03	7.2494E-01	0.000E+00	9.822E+00
1.349368E-01	2.71812E+01	3.3446E+00	4.6983E+03	8.3618E-01	0.000E+00	9.188E+00
1.442475E-01	2.61099E+01	2.8039E+00	3.6845E+03	9.6050E-01	0.000E+00	8.595E+00
1.487358E-01	2.54432E+01	2.6129E+00	3.3300E+03	1.0222E+00	0.000E+00	8.336E+00
1.510123E-01	2.48184E+01	2.5291E+00	3.1745E+03	1.0539E+00	0.000E+00	8.210E+00
1.516194E-01	2.42440E+01	2.5080E+00	3.1355E+03	1.0624E+00	0.000E+00	8.177E+00
1.525301E-01	2.47286E+01	3.5104E+00	4.3625E+03	1.0752E+00	0.000E+00	8.129E+00
1.542005E-01	2.49993E+01	3.4236E+00	4.2085E+03	1.0988E+00	0.000E+00	8.040E+00
1.548066E-01	2.50287E+01	3.3934E+00	4.1549E+03	1.1074E+00	0.000E+00	8.009E+00
1.648404E-01	2.47151E+01	2.9726E+00	3.4182E+03	1.2518E+00	0.000E+00	7.521E+00
1.762144E-01	2.39650E+01	2.6352E+00	2.8347E+03	1.4205E+00	0.000E+00	7.036E+00
1.883732E-01	2.30160E+01	2.3872E+00	2.4021E+03	1.6053E+00	0.000E+00	6.582E+00
1.968143E-01	2.22510E+01	2.2627E+00	2.1792E+03	1.7359E+00	0.000E+00	6.300E+00
1.998268E-01	2.19090E+01	2.2257E+00	2.1113E+03	1.7829E+00	0.000E+00	6.205E+00
2.006301E-01	2.17529E+01	2.2165E+00	2.0941E+03	1.7955E+00	0.000E+00	6.180E+00
2.013709E-01	2.17327E+01	2.3672E+00	2.2282E+03	1.8071E+00	0.000E+00	6.157E+00
2.018351E-01	2.17199E+01	2.3624E+00	2.2186E+03	1.8143E+00	0.000E+00	6.143E+00
2.048475E-01	2.14941E+01	2.3331E+00	2.1589E+03	1.8616E+00	0.000E+00	6.053E+00
2.083358E-01	2.11551E+01	2.3028E+00	2.0952E+03	1.9165E+00	0.000E+00	5.951E+00
2.115247E-01	2.07692E+01	2.2781E+00	2.0414E+03	1.9668E+00	0.000E+00	5.861E+00
2.123750E-01	2.05986E+01	2.2719E+00	2.0278E+03	1.9803E+00	0.000E+00	5.838E+00
2.136505E-01	2.05293E+01	2.4240E+00	2.1506E+03	2.0005E+00	0.000E+00	5.803E+00
2.152655E-01	2.03888E+01	2.4306E+00	2.1403E+03	2.0261E+00	0.000E+00	5.760E+00
2.168393E-01	2.02233E+01	2.4393E+00	2.1323E+03	2.0511E+00	0.000E+00	5.718E+00
2.185326E-01	2.00163E+01	2.4512E+00	2.1261E+03	2.0780E+00	0.000E+00	5.673E+00
2.194112E-01	1.98639E+01	2.4584E+00	2.1239E+03	2.0919E+00	0.000E+00	5.651E+00
2.207289E-01	1.97713E+01	2.5887E+00	2.2231E+03	2.1129E+00	0.000E+00	5.617E+00
2.240234E-01	1.94461E+01	2.6548E+00	2.2463E+03	2.1654E+00	0.000E+00	5.534E+00
2.301188E-01	1.87511E+01	2.8285E+00	2.3299E+03	2.2628E+00	0.000E+00	5.388E+00
2.459970E-01	1.67587E+01	3.6929E+00	2.8456E+03	2.5172E+00	0.000E+00	5.040E+00
2.629708E-01	1.46405E+01	5.3284E+00	3.8407E+03	2.7896E+00	0.000E+00	4.715E+00
2.811158E-01	1.27195E+01	7.8484E+00	5.2920E+03	3.0795E+00	0.000E+00	4.410E+00
3.005128E-01	1.13765E+01	1.1196E+01	7.0622E+03	3.3866E+00	0.000E+00	4.126E+00
3.212482E-01	1.09309E+01	1.5124E+01	8.9238E+03	3.7104E+00	0.000E+00	3.859E+00
3.434143E-01	1.15467E+01	1.9260E+01	1.0631E+04	4.0499E+00	0.000E+00	3.610E+00
3.671099E-01	1.31988E+01	2.3215E+01	1.1986E+04	4.4041E+00	0.000E+00	3.377E+00
3.924405E-01	1.57191E+01	2.6664E+01	1.2879E+04	4.7717E+00	0.000E+00	3.159E+00
4.195189E-01	1.88335E+01	2.9399E+01	1.3283E+04	5.1511E+00	0.000E+00	2.955E+00
4.484657E-01	2.22323E+01	3.1330E+01	1.3242E+04	5.5405E+00	0.000E+00	2.765E+00
4.794098E-01	2.55879E+01	3.2465E+01	1.2836E+04	5.9381E+00	0.000E+00	2.586E+00
5.124891E-01	2.84348E+01	3.2878E+01	1.2160E+04	6.3416E+00	0.000E+00	2.419E+00
5.262900E-01	2.90892E+01	3.2855E+01	1.1837E+04	6.5030E+00	0.000E+00	2.356E+00
5.343150E-01	2.87576E+01	3.2816E+01	1.1642E+04	6.5957E+00	0.000E+00	2.320E+00
5.364630E-01	2.77842E+01	3.2799E+01	1.1589E+04	6.6202E+00	0.000E+00	2.311E+00
5.396850E-01	2.91264E+01	3.4989E+01	1.2289E+04	6.6568E+00	0.000E+00	2.297E+00
5.478508E-01	3.06477E+01	3.4966E+01	1.2098E+04	6.7486E+00	0.000E+00	2.263E+00
5.552680E-01	3.14093E+01	3.4926E+01	1.1923E+04	6.8308E+00	0.000E+00	2.233E+00
5.637670E-01	3.17678E+01	3.4860E+01	1.1721E+04	6.9237E+00	0.000E+00	2.199E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 597

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
5.660334E-01	3.13146E+01	3.4839E+01	1.1667E+04	6.9483E+00	0.000E+00	2.190E+00
5.694330E-01	3.23266E+01	3.6152E+01	1.2034E+04	6.9849E+00	0.000E+00	2.177E+00
5.779320E-01	3.37220E+01	3.6101E+01	1.1840E+04	7.0755E+00	0.000E+00	2.145E+00
5.856525E-01	3.46422E+01	3.6041E+01	1.1665E+04	7.1566E+00	0.000E+00	2.117E+00
6.260625E-01	3.83885E+01	3.5553E+01	1.0764E+04	7.5631E+00	0.000E+00	1.980E+00
6.692609E-01	4.14320E+01	3.4747E+01	9.8413E+03	7.9652E+00	0.000E+00	1.853E+00
7.154399E-01	4.39811E+01	3.3684E+01	8.9244E+03	8.3602E+00	0.000E+00	1.733E+00
7.526400E-01	4.51959E+01	3.2752E+01	8.2485E+03	8.6537E+00	0.000E+00	1.647E+00
7.648052E-01	4.47729E+01	3.2442E+01	8.0405E+03	8.7452E+00	0.000E+00	1.621E+00
7.672320E-01	4.39644E+01	3.2380E+01	7.9997E+03	8.7632E+00	0.000E+00	1.616E+00
7.718400E-01	4.52214E+01	3.4298E+01	8.4231E+03	8.7971E+00	0.000E+00	1.606E+00
7.833600E-01	4.66426E+01	3.4010E+01	8.2294E+03	8.8805E+00	0.000E+00	1.583E+00
8.175768E-01	4.88385E+01	3.3161E+01	7.6882E+03	9.1174E+00	0.000E+00	1.516E+00
8.739896E-01	5.13742E+01	3.1812E+01	6.8994E+03	9.4739E+00	0.000E+00	1.419E+00
9.104200E-01	5.26874E+01	3.0981E+01	6.4503E+03	9.6833E+00	0.000E+00	1.362E+00
9.243550E-01	5.30320E+01	3.0645E+01	6.2842E+03	9.7593E+00	0.000E+00	1.341E+00
9.280710E-01	5.29577E+01	3.0557E+01	6.2410E+03	9.7792E+00	0.000E+00	1.336E+00
9.342948E-01	5.34148E+01	3.0824E+01	6.2537E+03	9.8121E+00	0.000E+00	1.327E+00
9.475800E-01	5.40676E+01	3.0520E+01	6.1051E+03	9.8811E+00	0.000E+00	1.308E+00
9.987612E-01	5.63313E+01	2.9358E+01	5.5718E+03	1.0129E+01	0.000E+00	1.241E+00
1.067676E+00	5.78061E+01	2.7047E+01	4.8017E+03	1.0423E+01	0.000E+00	1.161E+00
1.075060E+00	5.78877E+01	2.6820E+01	4.7288E+03	1.0452E+01	0.000E+00	1.153E+00
1.091515E+00	5.79194E+01	2.6329E+01	4.5722E+03	1.0515E+01	0.000E+00	1.136E+00
1.095903E+00	5.77066E+01	2.6201E+01	4.5318E+03	1.0531E+01	0.000E+00	1.131E+00
1.102485E+00	5.81017E+01	2.6562E+01	4.5667E+03	1.0556E+01	0.000E+00	1.125E+00
1.118940E+00	5.85778E+01	2.6102E+01	4.4217E+03	1.0615E+01	0.000E+00	1.108E+00
1.141345E+00	5.89863E+01	2.5503E+01	4.2355E+03	1.0692E+01	0.000E+00	1.086E+00
1.220098E+00	5.99338E+01	2.3626E+01	3.6704E+03	1.0932E+01	0.000E+00	1.016E+00
1.304285E+00	6.05661E+01	2.1936E+01	3.1880E+03	1.1143E+01	0.000E+00	9.506E-01
1.394281E+00	6.09767E+01	2.0386E+01	2.7715E+03	1.1323E+01	0.000E+00	8.892E-01
1.490486E+00	6.12034E+01	1.8981E+01	2.4139E+03	1.1471E+01	0.000E+00	8.318E-01
1.593329E+00	6.12676E+01	1.7704E+01	2.1061E+03	1.1585E+01	0.000E+00	7.781E-01
1.703269E+00	6.12114E+01	1.6533E+01	1.8398E+03	1.1666E+01	0.000E+00	7.279E-01
1.820795E+00	6.09357E+01	1.5468E+01	1.5468E+03	1.1712E+01	0.000E+00	6.809E-01
1.946430E+00	6.04546E+01	1.4499E+01	1.4120E+03	1.1723E+01	0.000E+00	6.370E-01
2.080733E+00	5.97095E+01	1.3616E+01	1.2404E+03	1.1701E+01	0.000E+00	5.959E-01
2.224304E+00	5.85694E+01	1.2752E+01	1.0867E+03	1.1645E+01	0.000E+00	5.574E-01
2.377781E+00	5.67018E+01	1.1849E+01	9.4459E+02	1.1556E+01	0.000E+00	5.214E-01
2.541848E+00	5.33616E+01	1.1007E+01	8.2079E+02	1.1436E+01	0.000E+00	4.878E-01
2.717235E+00	4.59437E+01	1.0239E+01	7.1424E+02	1.1286E+01	0.000E+00	4.563E-01
2.834552E+00	3.04620E+01	9.7875E+00	6.5450E+02	1.1175E+01	0.000E+00	4.374E-01
2.877938E+00	3.91320E+00	9.6312E+00	6.3435E+02	1.1133E+01	0.000E+00	4.308E-01
2.889508E+00	-3.74580E+01	9.5904E+00	6.2913E+02	1.1121E+01	0.000E+00	4.291E-01
2.904724E+00	2.47717E+01	9.2341E+00	6.0258E+02	1.1106E+01	0.000E+00	4.268E-01
2.906862E+00	3.04462E+01	8.9223E+01	5.8180E+02	1.1104E+01	0.000E+00	4.265E-01
2.950248E+00	6.10732E+01	4.6239E+01	2.9708E+02	1.1061E+01	0.000E+00	4.203E-01
2.961070E+00	6.00444E+01	3.9807E+01	2.5482E+02	1.1050E+01	0.000E+00	4.187E-01
3.006393E+00	3.42210E+01	2.4373E+01	1.5367E+02	1.1003E+01	0.000E+00	4.124E-01
3.018479E+00	2.87417E+00	2.4093E+01	1.5130E+02	1.0991E+01	0.000E+00	4.108E-01
3.036608E+00	4.65948E+01	8.1273E+01	5.0732E+02	1.0972E+01	0.000E+00	4.083E-01
3.081930E+00	7.27471E+01	5.5631E+01	3.4215E+02	1.0925E+01	0.000E+00	4.023E-01
3.105150E+00	7.46832E+01	4.7631E+01	2.9076E+02	1.0900E+01	0.000E+00	3.993E-01
3.319406E+00	6.83105E+01	3.2336E+01	1.8465E+02	1.0669E+01	0.000E+00	3.735E-01
3.467240E+00	6.88192E+01	3.1448E+01	1.7193E+02	1.0506E+01	0.000E+00	3.576E-01
3.520310E+00	6.78565E+01	3.0967E+01	1.6674E+02	1.0447E+01	0.000E+00	3.522E-01
3.534462E+00	6.57522E+01	3.0832E+01	1.6535E+02	1.0431E+01	0.000E+00	3.508E-01
3.548445E+00	6.77391E+01	3.5487E+01	1.8957E+02	1.0416E+01	0.000E+00	3.494E-01
3.555690E+00	6.87691E+01	3.5397E+01	1.8870E+02	1.0408E+01	0.000E+00	3.487E-01
3.608760E+00	7.49523E+01	3.4463E+01	1.8102E+02	1.0348E+01	0.000E+00	3.436E-01
3.793288E+00	7.54230E+01	2.7023E+01	1.3503E+02	1.0141E+01	0.000E+00	3.269E-01
4.055024E+00	7.51149E+01	2.5836E+01	1.2077E+02	9.8485E+00	0.000E+00	3.058E-01
4.075820E+00	7.50982E+01	2.5726E+01	1.1964E+02	9.8254E+00	0.000E+00	3.042E-01
4.138205E+00	7.46761E+01	2.5404E+01	1.1637E+02	9.7561E+00	0.000E+00	2.996E-01
4.154841E+00	7.38819E+01	2.5320E+01	1.1551E+02	9.7377E+00	0.000E+00	2.984E-01
4.179795E+00	7.49319E+01	2.6916E+01	1.2206E+02	9.7701E+00	0.000E+00	2.966E-01

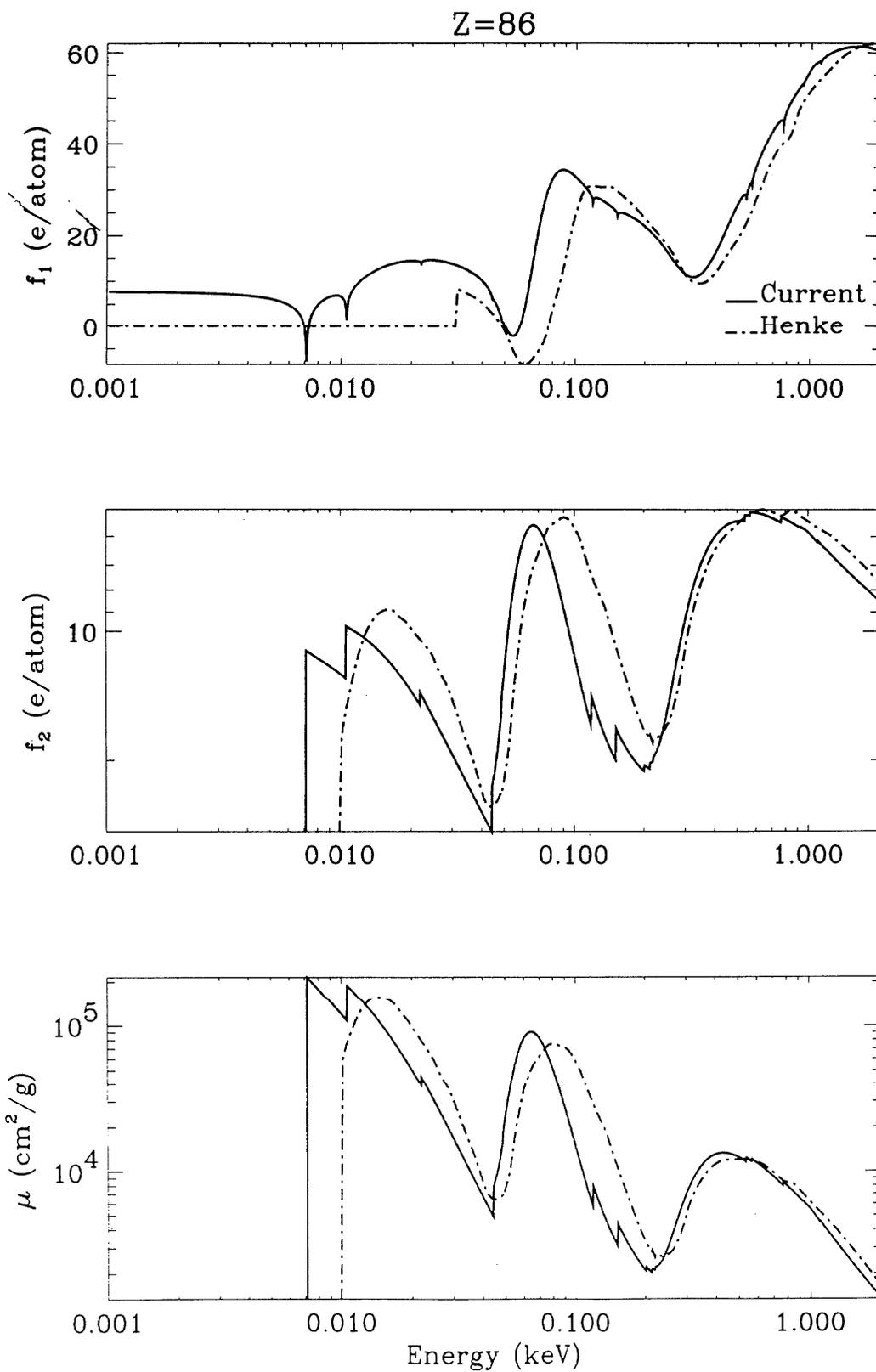
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

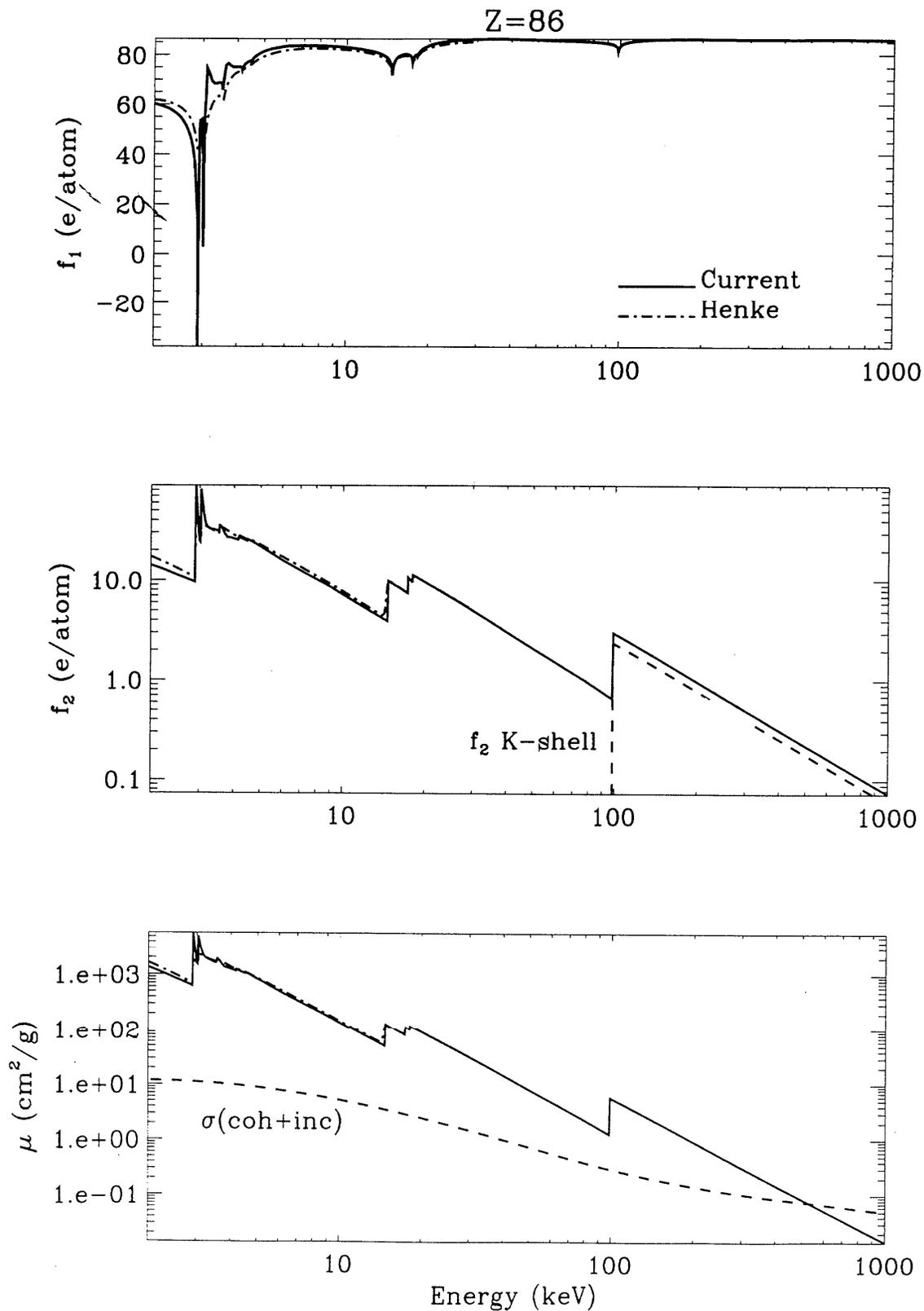
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
4.242180E+00	7.60974E+01	2.6477E+01	1.1831E+03	9.6413E+00	0.000E+00	2.923E-01
4.334821E+00	7.69902E+01	2.5800E+01	1.1282E+03	9.5398E+00	0.000E+00	2.860E-01
4.392360E+00	7.73457E+01	2.5377E+01	1.0952E+03	9.4771E+00	0.000E+00	2.823E-01
4.459590E+00	7.74471E+01	2.4889E+01	1.0579E+03	9.4042E+00	0.000E+00	2.780E-01
4.477518E+00	7.70644E+01	2.4758E+01	1.0481E+03	9.3848E+00	0.000E+00	2.769E-01
4.504410E+00	7.77817E+01	2.5577E+01	1.0763E+03	9.3559E+00	0.000E+00	2.753E-01
4.571640E+00	7.87118E+01	2.5073E+01	1.0396E+03	9.2838E+00	0.000E+00	2.712E-01
4.633924E+00	7.92949E+01	2.4593E+01	1.0060E+03	9.2174E+00	0.000E+00	2.676E-01
4.953664E+00	8.12352E+01	2.2108E+01	8.4596E+02	8.8838E+00	0.000E+00	2.503E-01
5.295467E+00	8.23386E+01	1.9711E+01	7.0554E+02	8.5412E+00	0.000E+00	2.341E-01
5.660855E+00	8.29397E+01	1.7551E+01	5.8767E+02	8.1919E+00	0.000E+00	2.190E-01
6.051453E+00	8.34596E+01	1.5649E+01	4.9017E+02	7.8382E+00	0.000E+00	2.049E-01
6.469004E+00	8.35356E+01	1.4135E+01	4.1417E+02	7.4821E+00	0.000E+00	1.917E-01
6.915365E+00	8.35619E+01	1.2786E+01	3.5046E+02	7.1257E+00	0.000E+00	1.793E-01
7.392525E+00	8.36237E+01	1.1571E+01	2.9669E+02	6.7708E+00	0.000E+00	1.677E-01
7.902609E+00	8.35402E+01	1.0483E+01	2.5144E+02	6.4191E+00	0.000E+00	1.569E-01
8.447890E+00	8.34633E+01	9.5124E+00	2.1344E+02	6.0724E+00	0.000E+00	1.468E-01
9.030794E+00	8.33675E+01	8.6075E+00	1.8067E+02	5.7319E+00	0.000E+00	1.373E-01
9.653919E+00	8.31474E+01	7.6974E+00	1.5114E+02	5.3990E+00	0.000E+00	1.284E-01
1.032004E+01	8.28248E+01	6.8927E+00	1.2660E+02	5.0749E+00	0.000E+00	1.201E-01
1.103212E+01	8.24107E+01	6.1770E+00	1.0613E+02	4.7606E+00	0.000E+00	1.124E-01
1.179334E+01	8.18825E+01	5.5434E+00	8.9098E+01	4.4568E+00	0.000E+00	1.051E-01
1.260708E+01	8.11713E+01	4.9819E+00	7.4904E+01	4.1643E+00	0.000E+00	9.834E-02
1.347697E+01	8.00480E+01	4.4697E+00	6.2865E+01	3.8836E+00	0.000E+00	9.200E-02
1.432701E+01	7.74631E+01	4.0501E+00	5.3584E+01	3.6370E+00	0.000E+00	8.654E-02
1.440688E+01	7.68640E+01	4.0143E+00	5.2817E+01	3.6151E+00	0.000E+00	8.606E-02
1.454630E+01	7.48515E+01	3.9528E+00	5.1508E+01	3.5774E+00	0.000E+00	8.523E-02
1.460478E+01	7.17863E+01	3.9274E+00	5.0973E+01	3.5618E+00	0.000E+00	8.489E-02
1.469250E+01	7.48389E+01	9.8855E+00	1.2753E+02	3.5385E+00	0.000E+00	8.439E-02
1.491179E+01	7.75422E+01	9.6491E+00	1.2265E+02	3.4814E+00	0.000E+00	8.315E-02
1.540095E+01	7.93574E+01	9.1516E+00	1.1264E+02	3.3592E+00	0.000E+00	8.050E-02
1.646362E+01	8.02686E+01	8.1592E+00	9.3939E+01	3.1159E+00	0.000E+00	7.531E-02
1.699036E+01	7.97622E+01	7.7257E+00	8.6191E+01	3.0056E+00	0.000E+00	7.297E-02
1.725041E+01	7.85366E+01	7.5246E+00	8.2682E+01	2.9533E+00	0.000E+00	7.187E-02
1.731976E+01	7.69944E+01	7.4723E+00	8.1779E+01	2.9397E+00	0.000E+00	7.159E-02
1.742378E+01	7.85556E+01	1.0443E+01	1.1361E+02	2.9193E+00	0.000E+00	7.116E-02
1.759961E+01	7.96359E+01	1.0270E+01	1.1061E+02	2.8855E+00	0.000E+00	7.045E-02
1.768802E+01	7.98846E+01	1.0185E+01	1.0914E+02	2.8687E+00	0.000E+00	7.010E-02
1.795875E+01	7.99644E+01	9.9308E+00	1.0482E+02	2.8182E+00	0.000E+00	6.904E-02
1.803095E+01	7.93318E+01	9.8647E+00	1.0370E+02	2.8050E+00	0.000E+00	6.876E-02
1.813924E+01	8.03157E+01	1.1305E+01	1.1813E+02	2.7853E+00	0.000E+00	6.835E-02
1.840998E+01	8.14412E+01	1.1052E+01	1.1379E+02	2.7372E+00	0.000E+00	6.735E-02
1.881398E+01	8.23219E+01	1.0691E+01	1.0771E+02	2.6677E+00	0.000E+00	6.590E-02
2.011215E+01	8.38524E+01	9.6316E+00	9.0775E+01	2.4626E+00	0.000E+00	6.165E-02
2.149988E+01	8.47234E+01	8.6710E+00	7.6447E+01	2.2699E+00	0.000E+00	5.767E-02
2.298338E+01	8.52917E+01	7.8074E+00	6.4390E+01	2.0893E+00	0.000E+00	5.395E-02
2.456923E+01	8.56786E+01	7.0280E+00	5.4221E+01	1.9205E+00	0.000E+00	5.046E-02
2.626450E+01	8.59512E+01	6.3293E+00	4.5678E+01	1.7632E+00	0.000E+00	4.721E-02
2.807676E+01	8.61471E+01	5.6672E+00	3.8260E+01	1.6169E+00	0.000E+00	4.416E-02
3.001403E+01	8.63113E+01	5.0628E+00	3.1974E+01	1.4812E+00	0.000E+00	4.131E-02
3.208502E+01	8.63539E+01	4.5199E+00	2.6702E+01	1.3555E+00	0.000E+00	3.864E-02
3.429889E+01	8.63577E+01	4.0393E+00	2.2323E+01	1.2395E+00	0.000E+00	3.615E-02
3.666551E+01	8.63973E+01	3.6038E+00	1.8631E+01	1.1327E+00	0.000E+00	3.381E-02
3.919543E+01	8.63486E+01	3.2085E+00	1.5517E+01	1.0344E+00	0.000E+00	3.163E-02
4.189992E+01	8.62805E+01	2.8588E+00	1.2933E+01	9.4418E-01	0.000E+00	2.959E-02
4.479101E+01	8.62003E+01	2.5491E+00	1.0788E+01	8.6158E-01	0.000E+00	2.768E-02
4.788159E+01	8.61118E+01	2.2747E+00	9.0050E+00	7.8607E-01	0.000E+00	2.589E-02
5.118542E+01	8.60176E+01	2.0314E+00	7.5226E+00	7.1718E-01	0.000E+00	2.422E-02
5.471721E+01	8.59188E+01	1.8154E+00	6.2890E+00	6.5443E-01	0.000E+00	2.266E-02
5.849270E+01	8.58157E+01	1.6236E+00	5.2614E+00	5.9736E-01	0.000E+00	2.120E-02
6.252870E+01	8.57075E+01	1.4531E+00	4.4049E+00	5.4556E-01	0.000E+00	1.983E-02
6.684318E+01	8.55914E+01	1.2991E+00	3.6839E+00	4.9859E-01	0.000E+00	1.855E-02
7.145536E+01	8.54621E+01	1.1619E+00	3.0823E+00	4.5606E-01	0.000E+00	1.735E-02
7.638578E+01	8.53123E+01	1.0398E+00	2.5802E+00	4.1761E-01	0.000E+00	1.623E-02
8.165640E+01	8.51253E+01	9.2583E-01	2.1491E+00	3.8288E-01	0.000E+00	1.518E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 599

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
8.729069E+01	8.48517E+01	8.1928E-01	1.7791E+00	3.5154E-01	0.000E+00	1.420E-02
9.331374E+01	8.43273E+01	7.2553E-01	1.4738E+00	3.2328E-01	0.000E+00	1.329E-02
9.643592E+01	8.36637E+01	6.8351E-01	1.3435E+00	3.1039E-01	0.000E+00	1.286E-02
9.791198E+01	8.26496E+01	6.6498E-01	1.2874E+00	3.0467E-01	0.000E+00	1.266E-02
9.830560E+01	8.14368E+01	6.6017E-01	1.2729E+00	3.0318E-01	0.000E+00	1.261E-02
9.889602E+01	8.27006E+01	3.0396E+00	5.8258E+00	3.0097E-01	4.574E+00	1.254E-02
9.975239E+01	8.35003E+01	2.9993E+00	5.6994E+00	2.9783E-01	4.478E+00	1.243E-02
1.003721E+02	8.38054E+01	2.9707E+00	5.6102E+00	2.9560E-01	4.409E+00	1.235E-02
1.066353E+02	8.49779E+01	2.7033E+00	4.8053E+00	2.7490E-01	3.792E+00	1.163E-02
1.139931E+02	8.54790E+01	2.4338E+00	4.0470E+00	2.5426E-01	3.205E+00	1.088E-02
1.218587E+02	8.57643E+01	2.1883E+00	3.4038E+00	2.3569E-01	2.705E+00	1.017E-02
1.302669E+02	8.59468E+01	1.9667E+00	2.8618E+00	2.1896E-01	2.281E+00	9.518E-03
1.392553E+02	8.60696E+01	1.7675E+00	2.4058E+00	2.0390E-01	1.922E+00	8.903E-03
1.488640E+02	8.61528E+01	1.5857E+00	2.0191E+00	1.9032E-01	1.617E+00	8.329E-03
1.591356E+02	8.62076E+01	1.4226E+00	1.6945E+00	1.7807E-01	1.359E+00	7.791E-03
1.701159E+02	8.62427E+01	1.2763E+00	1.4221E+00	1.6701E-01	1.143E+00	7.288E-03
1.818539E+02	8.62636E+01	1.1451E+00	1.1936E+00	1.5701E-01	9.603E-01	6.818E-03
1.944018E+02	8.62742E+01	1.0275E+00	1.0019E+00	1.4794E-01	8.072E-01	6.378E-03
2.078156E+02	8.62772E+01	9.2212E-01	8.4108E-01	1.3971E-01	6.785E-01	5.966E-03
2.221548E+02	8.62748E+01	8.2775E-01	7.0627E-01	1.3221E-01	5.704E-01	5.581E-03
2.374835E+02	8.62685E+01	7.4313E-01	5.9314E-01	1.2537E-01	4.795E-01	5.221E-03
2.538699E+02	8.62595E+01	6.6724E-01	4.9819E-01	1.1910E-01	4.031E-01	4.884E-03
2.713869E+02	8.62486E+01	5.9916E-01	4.1849E-01	1.1334E-01	3.389E-01	4.569E-03
2.901126E+02	8.62365E+01	5.3809E-01	3.5157E-01	1.0804E-01	2.849E-01	4.274E-03
3.101304E+02	8.62236E+01	4.8329E-01	2.9539E-01	1.0312E-01	2.395E-01	3.998E-03
3.315294E+02	8.62103E+01	4.3412E-01	2.4821E-01	9.8561E-02	2.014E-01	3.740E-03
3.544049E+02	8.61970E+01	3.8999E-01	2.0858E-01	9.4307E-02	1.693E-01	3.498E-03
3.788588E+02	8.61839E+01	3.5037E-01	1.7530E-01	9.0325E-02	1.423E-01	3.273E-03
4.050001E+02	8.61711E+01	3.1481E-01	1.4734E-01	8.6582E-02	1.196E-01	3.061E-03
4.329451E+02	8.61587E+01	2.8289E-01	1.2385E-01	8.3053E-02	1.006E-01	2.864E-03





Fr $Z = 87$ Atomic weight = 2.23000E+02 g/mol, nominal density ρ (g/cm³) = 1.0000E+00 μ_a (barns/atom) = μ (cm²/g) \times 3.70300E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.88701E+05

24 edges. Edge energies (keV):

K		1.01137E+02	L	I	1.86390E+00	L	II	1.79065E+00	L	III	1.50312E+01
M	I	4.65200E+00	M	II	4.32700E+00	M	III	3.66300E+00	M	IV	3.13620E+00
M	V	2.99970E+00	N	I	1.15300E+00	N	II	9.80000E-00	N	III	8.10000E-01
N	IV	6.03300E-00	N	V	5.77000E-00	N	VI	2.46488E-00	N	VII	2.38863E-01
O	I	2.20035E-00	O	II	1.69009E-00	O	III	1.32957E-00	O	IV	5.95378E-02
O	V	5.45529E-02	P	I	2.78679E-02	P	II	1.51650E-02	P	III	1.06123E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.2217E+00, -1.2942E+00 e/atomNuclear Thomson correction f_{NT} = -1.8620E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.040001E-02	-4.29397E+00	0.0000E+00	0.0000E+00	1.2036E-04	0.000E+00	1.192E+02
1.055920E-02	-1.04119E+01	0.0000E+00	0.0000E+00	1.2958E-04	0.000E+00	1.174E+02
1.060165E-02	-1.78248E+01	0.0000E+00	0.0000E+00	1.3213E-04	0.000E+00	1.169E+02
1.066532E-02	-9.97566E+00	1.4635E+01	2.5893E+05	1.3602E-04	0.000E+00	1.162E+02
1.069000E-02	-8.10559E+00	1.4564E+01	2.5709E+05	1.3754E-04	0.000E+00	1.160E+02
1.082450E-02	-3.08761E+00	1.4189E+01	2.4736E+05	1.4610E-04	0.000E+00	1.145E+02
1.142761E-02	3.75079E+00	1.2671E+01	2.0924E+05	1.8941E-04	0.000E+00	1.085E+02
1.221612E-02	6.79698E+00	1.1021E+01	1.7023E+05	2.5946E-04	0.000E+00	1.015E+02
1.305903E-02	8.07632E+00	9.5691E+00	1.3827E+05	3.5354E-04	0.000E+00	9.494E+01
1.396010E-02	8.09233E+00	8.2905E+00	1.1206E+05	4.7920E-04	0.000E+00	8.881E+01
1.486167E-02	5.35923E+00	7.2306E+00	9.1808E+04	6.3438E-04	0.000E+00	8.343E+01
1.492335E-02	4.76667E+00	7.1649E+00	9.0598E+04	6.4617E-04	0.000E+00	8.308E+01
1.508915E-02	1.47371E+00	6.9921E+00	8.7442E+04	6.7862E-04	0.000E+00	8.217E+01
1.514981E-02	-3.48118E+00	6.9303E+00	8.6322E+04	6.9077E-04	0.000E+00	8.184E+01
1.524080E-02	2.02215E+00	1.6744E+01	2.0731E+05	7.0930E-04	0.000E+00	8.135E+01
1.546827E-02	6.94430E+00	1.6024E+01	1.9548E+05	7.5717E-04	0.000E+00	8.015E+01
1.595306E-02	1.05356E+01	1.4623E+01	1.7297E+05	8.6680E-04	0.000E+00	7.772E+01
1.705382E-02	1.35499E+01	1.2017E+01	1.3297E+05	1.1568E-03	0.000E+00	7.270E+01
1.823053E-02	1.47041E+01	1.0024E+01	1.0376E+05	1.5359E-03	0.000E+00	6.801E+01
1.948844E-02	1.51952E+01	8.4856E+00	8.2163E+04	2.0289E-03	0.000E+00	6.362E+01
2.083314E-02	1.53610E+01	7.2605E+00	6.5763E+04	2.6666E-03	0.000E+00	5.951E+01
2.227063E-02	1.53364E+01	6.2608E+00	5.3048E+04	3.4872E-03	0.000E+00	5.567E+01
2.380730E-02	1.51812E+01	5.4288E+00	4.3030E+04	4.5375E-03	0.000E+00	5.208E+01
2.545001E-02	1.49160E+01	4.7256E+00	3.5038E+04	5.8749E-03	0.000E+00	4.872E+01
2.720606E-02	1.44964E+01	4.1235E+00	2.8601E+04	7.5691E-03	0.000E+00	4.557E+01
2.731051E-02	1.44599E+01	4.0915E+00	2.8270E+04	7.6789E-03	0.000E+00	4.540E+01
2.772853E-02	1.42366E+01	3.9675E+00	2.7000E+04	8.1287E-03	0.000E+00	4.471E+01
2.784000E-02	1.40384E+01	3.9354E+00	2.6674E+04	8.2515E-03	0.000E+00	4.453E+01
2.800721E-02	1.41980E+01	4.2374E+00	2.8550E+04	8.4380E-03	0.000E+00	4.427E+01
2.842523E-02	1.42818E+01	4.1033E+00	2.7240E+04	8.9162E-03	0.000E+00	4.362E+01
2.908327E-02	1.42378E+01	3.9051E+00	2.5338E+04	9.7040E-03	0.000E+00	4.263E+01
3.109002E-02	1.38726E+01	3.3834E+00	2.0536E+04	1.2381E-02	0.000E+00	3.988E+01
3.323523E-02	1.33372E+01	2.9381E+00	1.6682E+04	1.5719E-02	0.000E+00	3.731E+01
3.552846E-02	1.26493E+01	2.5561E+00	1.3576E+04	1.9862E-02	0.000E+00	3.490E+01
3.797993E-02	1.17859E+01	2.2261E+00	1.1060E+04	2.4977E-02	0.000E+00	3.264E+01
4.060054E-02	1.06868E+01	1.9401E+00	9.0171E+03	3.1261E-02	0.000E+00	3.054E+01
4.340198E-02	9.24172E+00	1.6920E+00	7.3563E+03	3.8941E-02	0.000E+00	2.857E+01
4.639671E-02	7.23788E+00	1.4774E+00	6.0089E+03	4.8280E-02	0.000E+00	2.672E+01
4.959809E-02	4.16636E+00	1.2924E+00	4.9169E+03	5.9581E-02	0.000E+00	2.500E+01
5.302035E-02	-1.94328E+00	1.1330E+00	4.0323E+03	7.3188E-02	0.000E+00	2.338E+01
5.346183E-02	-3.39592E+00	1.1148E+00	3.9349E+03	7.5058E-02	0.000E+00	2.319E+01
5.428013E-02	-8.28821E+00	1.0824E+00	3.7628E+03	7.8596E-02	0.000E+00	2.284E+01
5.449834E-02	-1.29003E+01	1.0740E+00	3.7188E+03	7.9555E-02	0.000E+00	2.275E+01
5.482565E-02	-9.56276E+00	9.4014E+00	3.2358E+04	8.1005E-02	0.000E+00	2.261E+01
5.564395E-02	-7.57099E+00	1.0254E+01	3.4772E+04	8.4694E-02	0.000E+00	2.228E+01
5.667876E-02	-7.78448E+00	1.1446E+01	3.8107E+04	8.9489E-02	0.000E+00	2.187E+01
5.834708E-02	-1.02763E+01	1.3666E+01	4.4199E+04	9.7526E-02	0.000E+00	2.125E+01
5.924014E-02	-1.46377E+01	1.5021E+01	4.7848E+04	1.0198E-01	0.000E+00	2.093E+01
5.947829E-02	-1.96640E+01	1.5404E+01	4.8870E+04	1.0319E-01	0.000E+00	2.085E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 603

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
5.983552E-02	-1.49067E+01	2.5839E+01	8.1488E+04	1.0501E-01	0.000E+00	2.072E+01
6.058959E-02	-1.09069E+01	2.7721E+01	8.6336E+04	1.0892E-01	0.000E+00	2.046E+01
6.072859E-02	-1.04605E+01	2.8065E+01	8.7206E+04	1.0965E-01	0.000E+00	2.042E+01
6.477028E-02	-7.63173E-01	3.7010E+01	1.0782E+05	1.3198E-01	0.000E+00	1.914E+01
6.923942E-02	1.19830E+01	4.2431E+01	1.1564E+05	1.5919E-01	0.000E+00	1.791E+01
7.401695E-02	2.49875E+01	4.0957E+01	1.0442E+05	1.9116E-01	0.000E+00	1.675E+01
7.912411E-02	3.44872E+01	3.4661E+01	8.2662E+04	2.2853E-01	0.000E+00	1.567E+01
8.458368E-02	3.95132E+01	2.6691E+01	5.9546E+04	2.7200E-01	0.000E+00	1.466E+01
9.041995E-02	4.09454E+01	1.9311E+01	4.0300E+04	3.2232E-01	0.000E+00	1.371E+01
9.665893E-02	4.01932E+01	1.3486E+01	2.6327E+04	3.8029E-01	0.000E+00	1.283E+01
1.033284E-01	3.84133E+01	9.2950E+00	1.6975E+04	4.4676E-01	0.000E+00	1.200E+01
1.104581E-01	3.63113E+01	6.4375E+00	1.0998E+04	5.2260E-01	0.000E+00	1.122E+01
1.180797E-01	3.42174E+01	4.5422E+00	7.2587E+03	6.0870E-01	0.000E+00	1.050E+01
1.262272E-01	3.21710E+01	3.2975E+00	4.9296E+03	7.0601E-01	0.000E+00	9.822E+00
1.302983E-01	3.10527E+01	2.8656E+00	4.1501E+03	7.5650E-01	0.000E+00	9.515E+00
1.322926E-01	3.01419E+01	2.6873E+00	3.8332E+03	7.8166E-01	0.000E+00	9.372E+00
1.328244E-01	2.93747E+01	2.6430E+00	3.7548E+03	7.8842E-01	0.000E+00	9.334E+00
1.336222E-01	2.99535E+01	3.9126E+00	5.5254E+03	7.9859E-01	0.000E+00	9.279E+00
1.349368E-01	3.02267E+01	3.7871E+00	5.2960E+03	8.1544E-01	0.000E+00	9.188E+00
1.356165E-01	3.02520E+01	3.7252E+00	5.1833E+03	8.2419E-01	0.000E+00	9.142E+00
1.442475E-01	2.96373E+01	3.0822E+00	4.0320E+03	9.3791E-01	0.000E+00	8.595E+00
1.542005E-01	2.86015E+01	2.5847E+00	3.1630E+03	1.0743E+00	0.000E+00	8.040E+00
1.648404E-01	2.73575E+01	2.2433E+00	2.5681E+03	1.2255E+00	0.000E+00	7.521E+00
1.656291E-01	2.72376E+01	2.2234E+00	2.5332E+03	1.2369E+00	0.000E+00	7.486E+00
1.681643E-01	2.66582E+01	2.1635E+00	2.4277E+03	1.2738E+00	0.000E+00	7.373E+00
1.688403E-01	2.61545E+01	2.1485E+00	2.4012E+03	1.2836E+00	0.000E+00	7.343E+00
1.698543E-01	2.65525E+01	3.0117E+00	3.3458E+03	1.2985E+00	0.000E+00	7.299E+00
1.723895E-01	2.67670E+01	2.9216E+00	3.1980E+03	1.3357E+00	0.000E+00	7.192E+00
1.762144E-01	2.66924E+01	2.7986E+00	2.9969E+03	1.3923E+00	0.000E+00	7.036E+00
1.883732E-01	2.60173E+01	2.4902E+00	2.4945E+03	1.5754E+00	0.000E+00	6.582E+00
2.013709E-01	2.50915E+01	2.2659E+00	2.1233E+03	1.7755E+00	0.000E+00	6.157E+00
2.152655E-01	2.39420E+01	2.1083E+00	1.8482E+03	1.9930E+00	0.000E+00	5.760E+00
2.156348E-01	2.39070E+01	2.1050E+00	1.8421E+03	1.9988E+00	0.000E+00	5.750E+00
2.189353E-01	2.35511E+01	2.0767E+00	1.7900E+03	2.0509E+00	0.000E+00	5.663E+00
2.198155E-01	2.33824E+01	2.0697E+00	1.7767E+03	2.0648E+00	0.000E+00	5.640E+00
2.211357E-01	2.33614E+01	2.2421E+00	1.9133E+03	2.0857E+00	0.000E+00	5.607E+00
2.244362E-01	2.31489E+01	2.2200E+00	1.8665E+03	2.1380E+00	0.000E+00	5.524E+00
2.301188E-01	2.26610E+01	2.1874E+00	1.7937E+03	2.2283E+00	0.000E+00	5.388E+00
2.340857E-01	2.22701E+01	2.1682E+00	1.7478E+03	2.2915E+00	0.000E+00	5.297E+00
2.376687E-01	2.18519E+01	2.1531E+00	1.7095E+03	2.3487E+00	0.000E+00	5.217E+00
2.386241E-01	2.16828E+01	2.1494E+00	1.6997E+03	2.3639E+00	0.000E+00	5.196E+00
2.400573E-01	2.15829E+01	2.2791E+00	1.7915E+03	2.3868E+00	0.000E+00	5.165E+00
2.415586E-01	2.14436E+01	2.2876E+00	1.7871E+03	2.4108E+00	0.000E+00	5.133E+00
2.436403E-01	2.12188E+01	2.3022E+00	1.7831E+03	2.4440E+00	0.000E+00	5.089E+00
2.452560E-01	2.10204E+01	2.3159E+00	1.7818E+03	2.4698E+00	0.000E+00	5.055E+00
2.459970E-01	2.09100E+01	2.3229E+00	1.7818E+03	2.4817E+00	0.000E+00	5.040E+00
2.462419E-01	2.08613E+01	2.3253E+00	1.7819E+03	2.4856E+00	0.000E+00	5.035E+00
2.477208E-01	2.07371E+01	2.4424E+00	1.8605E+03	2.5093E+00	0.000E+00	5.005E+00
2.514182E-01	2.03427E+01	2.5174E+00	1.8895E+03	2.5684E+00	0.000E+00	4.931E+00
2.629708E-01	1.88987E+01	2.9170E+00	2.0896E+03	2.7531E+00	0.000E+00	4.715E+00
2.811158E-01	1.63963E+01	4.2112E+00	2.8268E+03	3.0425E+00	0.000E+00	4.410E+00
3.005128E-01	1.38493E+01	6.6175E+00	4.1554E+03	3.3494E+00	0.000E+00	4.126E+00
3.212482E-01	1.18075E+01	1.0220E+01	6.0032E+03	3.6733E+00	0.000E+00	3.859E+00
3.434143E-01	1.08331E+01	1.4767E+01	8.1140E+03	4.0133E+00	0.000E+00	3.610E+00
3.671099E-01	1.12710E+01	1.9728E+01	1.0141E+04	4.3685E+00	0.000E+00	3.377E+00
3.924405E-01	1.31412E+01	2.4493E+01	1.1777E+04	4.7375E+00	0.000E+00	3.159E+00
4.195189E-01	1.61759E+01	2.8553E+01	1.2843E+04	5.1189E+00	0.000E+00	2.955E+00
4.484657E-01	1.99611E+01	3.1609E+01	1.3300E+04	5.5108E+00	0.000E+00	2.765E+00
4.794098E-01	2.40317E+01	3.3572E+01	1.3214E+04	5.9113E+00	0.000E+00	2.586E+00
5.124891E-01	2.79498E+01	3.4511E+01	1.2707E+04	6.3183E+00	0.000E+00	2.419E+00
5.478508E-01	3.11907E+01	3.4586E+01	1.1913E+04	6.7293E+00	0.000E+00	2.263E+00
5.654600E-01	3.20491E+01	3.4373E+01	1.1471E+04	6.9249E+00	0.000E+00	2.193E+00
5.741150E-01	3.16212E+01	3.4222E+01	1.1248E+04	7.0188E+00	0.000E+00	2.160E+00
5.764230E-01	3.05090E+01	3.4178E+01	1.1189E+04	7.0436E+00	0.000E+00	2.151E+00
5.798850E-01	3.19936E+01	3.6604E+01	1.1911E+04	7.0807E+00	0.000E+00	2.138E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm^2/g	$\sigma(\text{coh+inc})$ cm^2/g	μ_{κ} cm^2/g	λ nm
5.856525E-01	3.32063E+01	3.6525E+01	1.1769E+04	7.1419E+00	0.000E+00	2.117E+00
5.885400E-01	3.35871E+01	3.6482E+01	1.1697E+04	7.1723E+00	0.000E+00	2.107E+00
5.912340E-01	3.38770E+01	3.6440E+01	1.1630E+04	7.2005E+00	0.000E+00	2.097E+00
6.002835E-01	3.43204E+01	3.6286E+01	1.1407E+04	7.2943E+00	0.000E+00	2.065E+00
6.026967E-01	3.38112E+01	3.6242E+01	1.1347E+04	7.3191E+00	0.000E+00	2.057E+00
6.063165E-01	3.49489E+01	3.7688E+01	1.1729E+04	7.3560E+00	0.000E+00	2.043E+00
6.153660E-01	3.64965E+01	3.7552E+01	1.1515E+04	7.4473E+00	0.000E+00	2.015E+00
6.260625E-01	3.77714E+01	3.7375E+01	1.1265E+04	7.5533E+00	0.000E+00	1.980E+00
6.692609E-01	4.16501E+01	3.6512E+01	1.0295E+04	7.9609E+00	0.000E+00	1.853E+00
7.154399E-01	4.47641E+01	3.5378E+01	9.3312E+03	8.3617E+00	0.000E+00	1.733E+00
7.648052E-01	4.72532E+01	3.4044E+01	8.3997E+03	8.7529E+00	0.000E+00	1.621E+00
7.938000E-01	4.80324E+01	3.3247E+01	7.9035E+03	8.9659E+00	0.000E+00	1.562E+00
8.059500E-01	4.76764E+01	3.2916E+01	7.7067E+03	9.0516E+00	0.000E+00	1.538E+00
8.091900E-01	4.67553E+01	3.2827E+01	7.6553E+03	9.0741E+00	0.000E+00	1.532E+00
8.140500E-01	4.80359E+01	3.4778E+01	8.0617E+03	9.1076E+00	0.000E+00	1.523E+00
8.175768E-01	4.86043E+01	3.4684E+01	8.0052E+03	9.1317E+00	0.000E+00	1.516E+00
8.262000E-01	4.94757E+01	3.4455E+01	7.8694E+03	9.1899E+00	0.000E+00	1.501E+00
8.739896E-01	5.22435E+01	3.3225E+01	7.1734E+03	9.4951E+00	0.000E+00	1.419E+00
9.342948E-01	5.46767E+01	3.1786E+01	6.4199E+03	9.8403E+00	0.000E+00	1.327E+00
9.604000E-01	5.55505E+01	3.1208E+01	6.1317E+03	9.9770E+00	0.000E+00	1.291E+00
9.751000E-01	5.59154E+01	3.0894E+01	5.9786E+03	1.0051E+01	0.000E+00	1.272E+00
9.790200E-01	5.58481E+01	3.0804E+01	5.9373E+03	1.0070E+01	0.000E+00	1.266E+00
9.849000E-01	5.62776E+01	3.1086E+01	5.9559E+03	1.0099E+01	0.000E+00	1.259E+00
9.987612E-01	5.69756E+01	3.0780E+01	5.8155E+03	1.0165E+01	0.000E+00	1.241E+00
9.996000E-01	5.70145E+01	3.0762E+01	5.8071E+03	1.0169E+01	0.000E+00	1.240E+00
1.067676E+00	5.90035E+01	2.8409E+01	5.0210E+03	1.0466E+01	0.000E+00	1.161E+00
1.129940E+00	5.99866E+01	2.6533E+01	4.4311E+03	1.0702E+01	0.000E+00	1.097E+00
1.141345E+00	6.00450E+01	2.6216E+01	4.3344E+03	1.0742E+01	0.000E+00	1.086E+00
1.147235E+00	6.00087E+01	2.6055E+01	4.2857E+03	1.0762E+01	0.000E+00	1.081E+00
1.151847E+00	5.97908E+01	2.5931E+01	4.2481E+03	1.0777E+01	0.000E+00	1.076E+00
1.158765E+00	6.01876E+01	2.6303E+01	4.2834E+03	1.0800E+01	0.000E+00	1.070E+00
1.176060E+00	6.06628E+01	2.5853E+01	4.1481E+03	1.0856E+01	0.000E+00	1.054E+00
1.220098E+00	6.13472E+01	2.4779E+01	3.8323E+03	1.0989E+01	0.000E+00	1.016E+00
1.304285E+00	6.21813E+01	2.2990E+01	3.3261E+03	1.1208E+01	0.000E+00	9.506E-01
1.394281E+00	6.27532E+01	2.1372E+01	2.8924E+03	1.1395E+01	0.000E+00	8.892E-01
1.490486E+00	6.31222E+01	1.9889E+01	2.5180E+03	1.1549E+01	0.000E+00	8.318E-01
1.593329E+00	6.33217E+01	1.8538E+01	2.1955E+03	1.1670E+01	0.000E+00	7.781E-01
1.703269E+00	6.33669E+01	1.7305E+01	1.9172E+03	1.1756E+01	0.000E+00	7.279E-01
1.820795E+00	6.32761E+01	1.6174E+01	1.6763E+03	1.1807E+01	0.000E+00	6.809E-01
1.946430E+00	6.29824E+01	1.5144E+01	1.4682E+03	1.1824E+01	0.000E+00	6.370E-01
2.080733E+00	6.24737E+01	1.4205E+01	1.2882E+03	1.1806E+01	0.000E+00	5.959E-01
2.224304E+00	6.16749E+01	1.3347E+01	1.1323E+03	1.1754E+01	0.000E+00	5.574E-01
2.377781E+00	6.04206E+01	1.2513E+01	9.9301E+02	1.1669E+01	0.000E+00	5.214E-01
2.541848E+00	5.82630E+01	1.1634E+01	8.6367E+02	1.1552E+01	0.000E+00	4.878E-01
2.717235E+00	5.39874E+01	1.0814E+01	7.5102E+02	1.1403E+01	0.000E+00	4.563E-01
2.904724E+00	4.07346E+01	1.0067E+01	6.5397E+02	1.1226E+01	0.000E+00	4.268E-01
2.939706E+00	3.35534E+01	9.9397E+00	6.3803E+02	1.1191E+01	0.000E+00	4.218E-01
2.984702E+00	5.99768E+00	9.7813E+00	6.1840E+02	1.1145E+01	0.000E+00	4.154E-01
2.996700E+00	-3.59252E+01	9.7400E+00	6.1333E+02	1.1133E+01	0.000E+00	4.137E-01
3.014699E+00	2.85719E+01	9.2172E+01	5.7694E+03	1.1115E+01	0.000E+00	4.113E-01
3.059694E+00	6.56038E+01	5.5084E+01	3.3972E+03	1.1068E+01	0.000E+00	4.052E-01
3.073476E+00	6.63977E+01	4.7515E+01	2.9172E+03	1.1054E+01	0.000E+00	4.034E-01
3.105150E+00	5.97023E+01	3.4547E+01	2.0995E+03	1.1021E+01	0.000E+00	3.993E-01
3.120519E+00	4.9596F+01	2.9945E+01	1.8108E+03	1.1004E+01	0.000E+00	3.973E-01
3.133064E+00	2.10042E+01	2.6811E+01	1.6148E+03	1.0991E+01	0.000E+00	3.957E-01
3.151881E+00	6.23780E+01	7.8249E+01	4.6847E+03	1.0971E+01	0.000E+00	3.934E-01
3.198924E+00	8.57830E+01	5.0346E+01	2.9699E+03	1.0921E+01	0.000E+00	3.876E-01
3.319406E+00	7.90372E+01	2.4705E+01	1.4044E+03	1.0790E+01	0.000E+00	3.735E-01
3.548445E+00	6.89534E+01	2.0567E+01	1.0937E+03	1.0536E+01	0.000E+00	3.494E-01
3.589740E+00	6.76753E+01	2.0607E+01	1.0833E+03	1.0490E+01	0.000E+00	3.454E-01
3.644685E+00	6.49999E+01	2.0791E+01	1.0765E+03	1.0428E+01	0.000E+00	3.402E-01
3.659337E+00	6.24317E+01	2.0861E+01	1.0757E+03	1.0412E+01	0.000E+00	3.388E-01
3.681315E+00	6.47302E+01	2.5764E+01	1.3206E+03	1.0387E+01	0.000E+00	3.368E-01
3.736260E+00	6.66375E+01	2.5962E+01	1.3112E+03	1.0325E+01	0.000E+00	3.318E-01
3.793288E+00	6.74155E+01	2.6239E+01	1.3053E+03	1.0261E+01	0.000E+00	3.269E-01

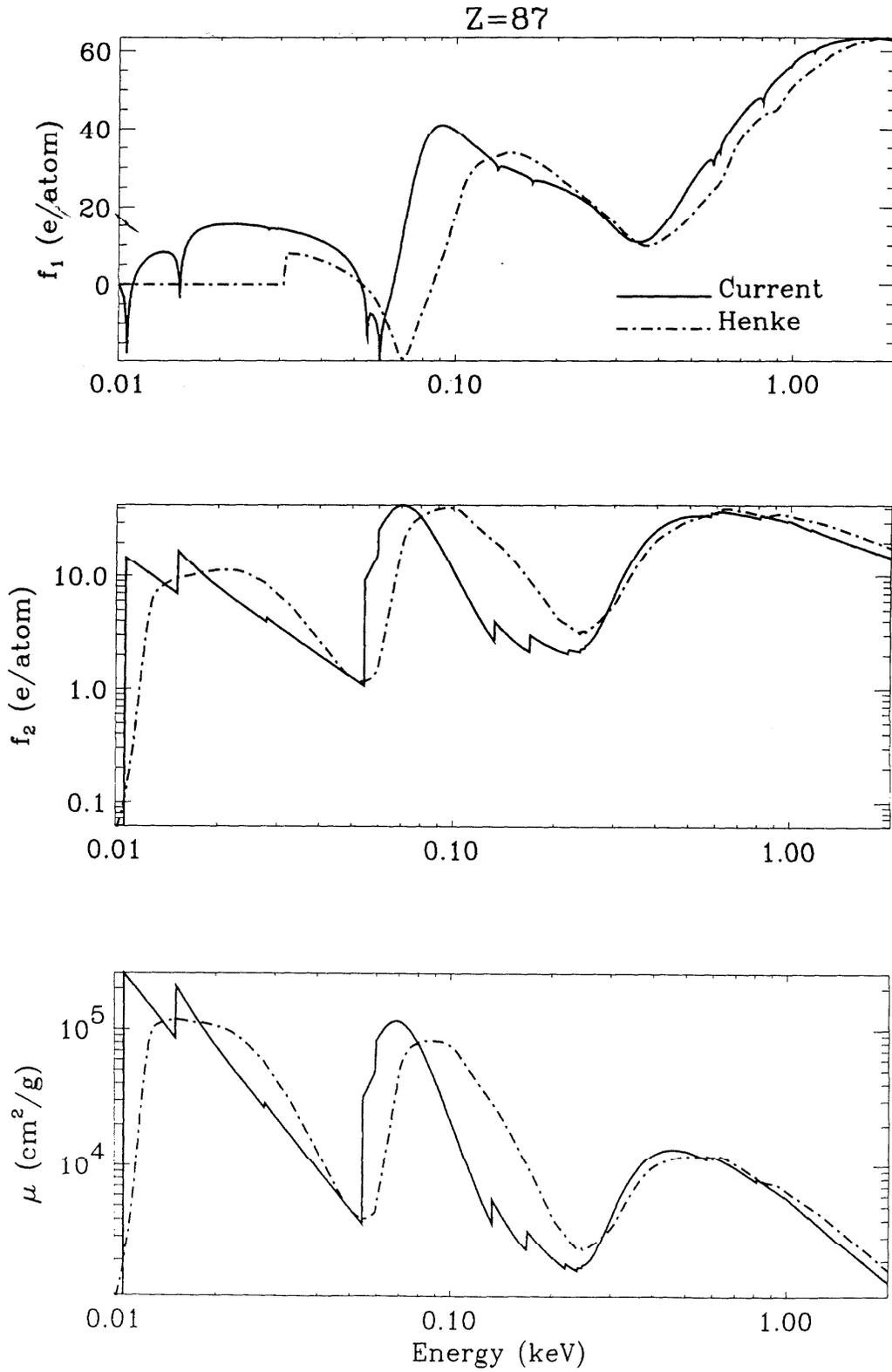
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 605

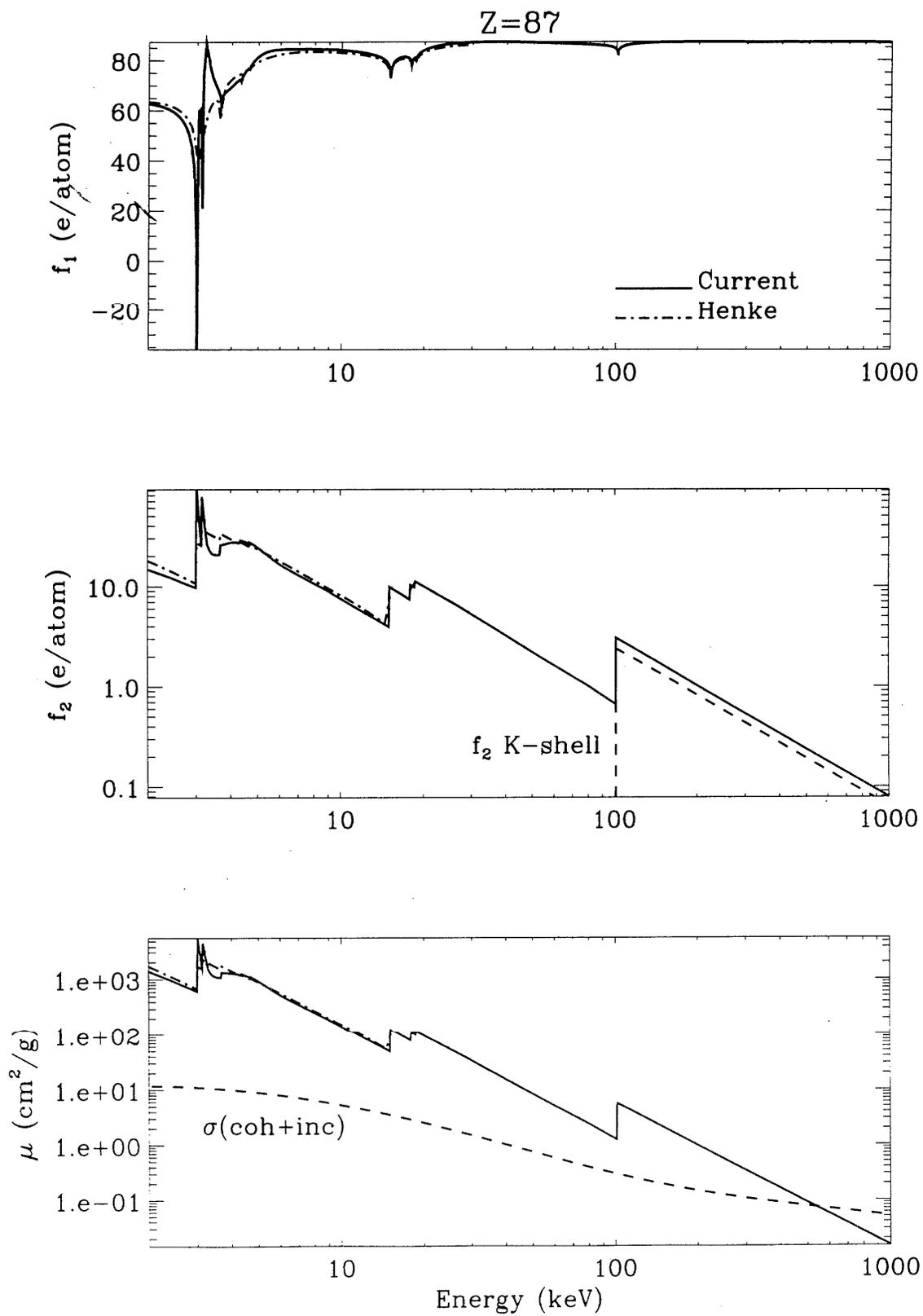
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.055024E+00	7.02287E+01	2.7471E+01	1.2784E+03	9.9671E+00	0.000E+00	3.058E-01
4.240460E+00	7.22516E+01	2.7445E+01	1.2213E+03	9.7607E+00	0.000E+00	2.924E-01
4.305365E+00	7.24567E+01	2.7292E+01	1.1962E+03	9.6891E+00	0.000E+00	2.880E-01
4.322673E+00	7.19005E+01	2.7234E+01	1.1889E+03	9.6700E+00	0.000E+00	2.868E-01
4.334821E+00	7.23290E+01	2.8735E+01	1.2509E+03	9.6567E+00	0.000E+00	2.860E-01
4.348635E+00	7.30123E+01	2.8681E+01	1.2446E+03	9.6415E+00	0.000E+00	2.851E-01
4.413540E+00	7.45195E+01	2.8384E+01	1.2136E+03	9.5704E+00	0.000E+00	2.809E-01
4.558960E+00	7.65754E+01	2.7479E+01	1.1374E+03	9.4126E+00	0.000E+00	2.720E-01
4.628740E+00	7.70715E+01	2.6948E+01	1.0986E+03	9.3377E+00	0.000E+00	2.679E-01
4.633924E+00	7.70566E+01	2.6906E+01	1.0957E+03	9.3321E+00	0.000E+00	2.676E-01
4.647348E+00	7.67887E+01	2.6798E+01	1.0881E+03	9.3178E+00	0.000E+00	2.668E-01
4.675260E+00	7.76428E+01	2.7579E+01	1.1131E+03	9.2880E+00	0.000E+00	2.652E-01
4.745040E+00	7.88892E+01	2.6972E+01	1.0726E+03	9.2139E+00	0.000E+00	2.613E-01
4.953664E+00	8.11712E+01	2.4980E+01	9.5157E+02	8.9959E+00	0.000E+00	2.503E-01
5.295467E+00	8.32124E+01	2.1753E+01	7.7516E+02	8.6504E+00	0.000E+00	2.341E-01
5.660855E+00	8.41123E+01	1.8849E+01	6.2832E+02	8.2978E+00	0.000E+00	2.190E-01
6.051453E+00	8.44497E+01	1.6491E+01	5.1425E+02	7.9405E+00	0.000E+00	2.049E-01
6.469004E+00	8.45206E+01	1.4798E+01	4.3165E+02	7.5806E+00	0.000E+00	1.917E-01
6.915365E+00	8.45253E+01	1.3381E+01	3.6513E+02	7.2202E+00	0.000E+00	1.793E-01
7.392525E+00	8.45976E+01	1.2119E+01	3.0936E+02	6.8612E+00	0.000E+00	1.677E-01
7.902609E+00	8.45398E+01	1.0979E+01	2.6215E+02	6.5053E+00	0.000E+00	1.569E-01
8.447890E+00	8.44448E+01	9.9625E+00	2.2253E+02	6.1541E+00	0.000E+00	1.468E-01
9.030794E+00	8.44112E+01	9.0167E+00	1.8841E+02	5.8093E+00	0.000E+00	1.373E-01
9.653919E+00	8.42523E+01	8.0629E+00	1.5760E+02	5.4721E+00	0.000E+00	1.284E-01
1.032004E+01	8.39640E+01	7.2189E+00	1.3200E+02	5.1437E+00	0.000E+00	1.201E-01
1.103212E+01	8.35906E+01	6.4723E+00	1.1071E+02	4.8250E+00	0.000E+00	1.124E-01
1.179334E+01	8.31200E+01	5.8069E+00	9.2914E+01	4.5171E+00	0.000E+00	1.051E-01
1.260708E+01	8.25053E+01	5.2175E+00	7.8095E+01	4.2205E+00	0.000E+00	9.834E-02
1.347697E+01	8.16146E+01	4.6884E+00	6.5646E+01	3.9358E+00	0.000E+00	9.200E-02
1.440688E+01	7.98741E+01	4.2089E+00	5.5128E+01	3.6636E+00	0.000E+00	8.606E-02
1.473058E+01	7.85098E+01	4.0619E+00	5.2034E+01	3.5757E+00	0.000E+00	8.417E-02
1.495604E+01	7.59168E+01	3.9650E+00	5.0026E+01	3.5164E+00	0.000E+00	8.290E-02
1.501617E+01	7.28721E+01	3.9398E+00	4.9510E+01	3.5009E+00	0.000E+00	8.257E-02
1.510636E+01	7.59044E+01	9.8591E+00	1.2316E+02	3.4778E+00	0.000E+00	8.207E-02
1.533182E+01	7.85922E+01	9.6263E+00	1.1848E+02	3.4211E+00	0.000E+00	8.087E-02
1.540095E+01	7.89881E+01	9.5566E+00	1.1709E+02	3.4040E+00	0.000E+00	8.050E-02
1.646362E+01	8.12238E+01	8.5482E+00	9.7977E+01	3.1573E+00	0.000E+00	7.531E-02
1.754837E+01	8.08361E+01	7.6554E+00	8.2320E+01	2.9334E+00	0.000E+00	7.065E-02
1.759961E+01	8.07123E+01	7.6167E+00	8.1666E+01	2.9235E+00	0.000E+00	7.045E-02
1.781697E+01	7.96108E+01	7.4561E+00	7.8968E+01	2.8819E+00	0.000E+00	6.959E-02
1.788859E+01	7.80761E+01	7.4043E+00	7.8105E+01	2.8684E+00	0.000E+00	6.931E-02
1.799603E+01	7.96241E+01	1.0358E+01	1.0861E+02	2.8483E+00	0.000E+00	6.890E-02
1.826622E+01	8.09327E+01	1.0107E+01	1.0441E+02	2.7988E+00	0.000E+00	6.788E-02
1.854580E+01	8.10130E+01	9.8572E+00	1.0030E+02	2.7490E+00	0.000E+00	6.685E-02
1.862036E+01	8.03858E+01	9.7923E+00	9.9236E+01	2.7360E+00	0.000E+00	6.659E-02
1.873219E+01	8.13617E+01	1.1222E+01	1.1305E+02	2.7166E+00	0.000E+00	6.619E-02
1.881398E+01	8.18093E+01	1.1149E+01	1.1182E+02	2.7026E+00	0.000E+00	6.590E-02
1.901178E+01	8.24782E+01	1.0972E+01	1.0891E+02	2.6691E+00	0.000E+00	6.521E-02
2.011215E+01	8.42648E+01	1.0061E+01	9.4398E+01	2.4945E+00	0.000E+00	6.165E-02
2.149988E+01	8.53656E+01	9.0600E+00	7.9518E+01	2.2990E+00	0.000E+00	5.767E-02
2.298338E+01	8.60511E+01	8.1590E+00	6.6988E+01	2.1159E+00	0.000E+00	5.395E-02
2.456923E+01	8.65130E+01	7.3481E+00	5.6436E+01	1.9447E+00	0.000E+00	5.046E-02
2.626450E+01	8.68367E+01	6.6190E+00	4.7555E+01	1.7851E+00	0.000E+00	4.721E-02
2.807676E+01	8.70718E+01	5.9278E+00	3.9840E+01	1.6368E+00	0.000E+00	4.416E-02
3.001405E+01	8.72035E+01	5.3022E+00	3.3335E+01	1.4992E+00	0.000E+00	4.131E-02
3.208502E+01	8.73281E+01	4.7340E+00	2.7842E+01	1.3718E+00	0.000E+00	3.864E-02
3.429889E+01	8.73466E+01	4.2308E+00	2.3276E+01	1.2542E+00	0.000E+00	3.615E-02
3.666551E+01	8.73712E+01	3.7818E+00	1.9463E+01	1.1459E+00	0.000E+00	3.381E-02
3.919543E+01	8.73621E+01	3.3698E+00	1.6223E+01	1.0463E+00	0.000E+00	3.163E-02
4.189992E+01	8.73029E+01	3.0024E+00	1.3522E+01	9.5489E-01	0.000E+00	2.959E-02
4.479101E+01	8.72287E+01	2.6771E+00	1.1278E+01	8.7121E-01	0.000E+00	2.768E-02
4.788159E+01	8.71447E+01	2.3889E+00	9.4146E+00	7.9474E-01	0.000E+00	2.589E-02
5.118542E+01	8.70540E+01	2.1333E+00	7.8647E+00	7.2498E-01	0.000E+00	2.422E-02
5.471721E+01	8.69582E+01	1.9065E+00	6.5749E+00	6.6145E-01	0.000E+00	2.266E-02
5.849270E+01	8.68580E+01	1.7051E+00	5.5007E+00	6.0370E-01	0.000E+00	2.120E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_K cm ² /g	λ nm
6.252870E+01	8.67531E+01	1.5260E+00	4.6053E+00	5.5127E-01	0.000E+00	1.983E-02
6.684318E+01	8.66420E+01	1.3656E+00	3.8553E+00	5.0376E-01	0.000E+00	1.855E-02
7.145536E+01	8.65199E+01	1.2215E+00	3.2258E+00	4.6075E-01	0.000E+00	1.735E-02
7.638578E+01	8.63810E+01	1.0936E+00	2.7015E+00	4.2188E-01	0.000E+00	1.623E-02
8.165640E+01	8.62161E+01	9.7562E-01	2.2546E+00	3.8677E-01	0.000E+00	1.518E-02
8.729069E+01	8.59879E+01	8.6330E-01	1.8662E+00	3.5510E-01	0.000E+00	1.420E-02
9.331374E+01	8.56091E+01	7.6448E-01	1.5459E+00	3.2656E-01	0.000E+00	1.329E-02
9.911426E+01	8.46796E+01	6.8536E-01	1.3048E+00	3.0321E-01	0.000E+00	1.251E-02
9.975239E+01	8.44086E+01	6.7746E-01	1.2815E+00	3.0085E-01	0.000E+00	1.243E-02
1.006313E+02	8.36723E+01	6.6682E-01	1.2504E+00	2.9767E-01	0.000E+00	1.232E-02
1.010359E+02	8.24676E+01	6.6201E-01	1.2364E+00	2.9623E-01	0.000E+00	1.227E-02
1.016427E+02	8.37230E+01	3.0253E+00	5.6165E+00	2.9409E-01	4.401E+00	1.220E-02
1.031597E+02	8.48204E+01	2.9566E+00	5.4082E+00	2.8890E-01	4.242E+00	1.202E-02
1.066353E+02	8.56341E+01	2.8079E+00	4.9688E+00	2.7771E-01	3.906E+00	1.163E-02
1.139931E+02	8.63148E+01	2.5290E+00	4.1864E+00	2.5688E-01	3.304E+00	1.088E-02
1.218587E+02	8.66638E+01	2.2750E+00	3.5229E+00	2.3814E-01	2.790E+00	1.017E-02
1.302669E+02	8.68793E+01	2.0454E+00	2.9629E+00	2.2127E-01	2.353E+00	9.518E-03
1.392553E+02	8.70218E+01	1.8386E+00	2.4915E+00	2.0608E-01	1.984E+00	8.903E-03
1.488640E+02	8.71190E+01	1.6513E+00	2.0932E+00	1.9239E-01	1.671E+00	8.329E-03
1.591356E+02	8.71836E+01	1.4820E+00	1.7574E+00	1.8005E-01	1.406E+00	7.791E-03
1.701159E+02	8.72258E+01	1.3301E+00	1.4754E+00	1.6891E-01	1.182E+00	7.288E-03
1.818539E+02	8.72519E+01	1.1938E+00	1.2388E+00	1.5883E-01	9.944E-01	6.818E-03
1.944018E+02	8.72664E+01	1.0716E+00	1.0402E+00	1.4970E-01	8.362E-01	6.378E-03
2.078156E+02	8.72723E+01	9.6198E-01	8.7350E-01	1.4142E-01	7.032E-01	5.966E-03
2.221548E+02	8.72719E+01	8.6395E-01	7.3385E-01	1.3387E-01	5.916E-01	5.581E-03
2.374835E+02	8.72673E+01	7.7605E-01	6.1664E-01	1.2698E-01	4.977E-01	5.221E-03
2.538699E+02	8.72596E+01	6.9718E-01	5.1821E-01	1.2068E-01	4.187E-01	4.884E-03
2.713869E+02	8.72496E+01	6.2639E-01	4.3554E-01	1.1489E-01	3.523E-01	4.569E-03
2.901126E+02	8.72382E+01	5.6285E-01	3.6610E-01	1.0955E-01	2.964E-01	4.274E-03
3.101304E+02	8.72258E+01	5.0581E-01	3.0777E-01	1.0461E-01	2.493E-01	3.998E-03
3.315294E+02	8.72130E+01	4.5460E-01	2.5875E-01	1.0002E-01	2.098E-01	3.740E-03
3.544049E+02	8.72000E+01	4.0861E-01	2.1756E-01	9.5737E-02	1.765E-01	3.498E-03
3.788588E+02	8.71870E+01	3.6731E-01	1.8295E-01	9.1730E-02	1.485E-01	3.273E-03
4.050001E+02	8.71742E+01	3.3021E-01	1.5385E-01	8.7965E-02	1.249E-01	3.061E-03
4.329451E+02	8.71619E+01	2.9688E-01	1.2940E-01	8.4414E-02	1.051E-01	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 609

Ra Z = 88

Atomic weight = 2.260254E+02 g/mol, nominal density ρ (g/cm³) = 5.0000E+00

μ_a (barns/atom) = μ (cm²/g) \times 3.75324E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.86175E+05

24 edges. Edge energies (keV):

K		1.03922E+02	L	I	1.92367E+00	L	II	1.84843E+00	L	III	1.54444E+01
M	I	4.82200E+00	M	II	4.48950E+00	M	III	3.79180E+00	M	IV	3.24840E+00
M	V	3.10490E+00	N	I	1.20840E+00	N	II	1.05760E+00	N	III	8.79100E-01
N	IV	6.35900E-00	N	V	6.02700E-00	N	VI	2.98900E-00	N	VII	2.98900E-01
O	I	2.54400E-00	O	II	2.00400E-00	O	III	1.52800E-00	O	IV	6.72000E-02
O	V	6.72000E-02	P	I	4.35000E-02	P	II	1.88000E-02	P	III	1.88000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.2901E+00, -1.3326E+00 e/atom

Nuclear Thomson correction f_{NT} = -1.8795E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	8.67455E+00	0.0000E+00	0.0000E+00	1.2723E-04	0.000E+00	1.160E+02
1.142761E-02	8.41850E+00	0.0000E+00	0.0000E+00	1.7555E-04	0.000E+00	1.085E+02
1.221612E-02	8.09757E+00	0.0000E+00	0.0000E+00	2.4093E-04	0.000E+00	1.015E+02
1.305903E-02	7.68553E+00	0.0000E+00	0.0000E+00	3.2890E-04	0.000E+00	9.494E+01
1.396010E-02	7.13831E+00	0.0000E+00	0.0000E+00	4.4664E-04	0.000E+00	8.881E+01
1.492335E-02	6.37387E+00	0.0000E+00	0.0000E+00	6.0336E-04	0.000E+00	8.308E+01
1.595306E-02	5.21453E+00	0.0000E+00	0.0000E+00	8.1083E-04	0.000E+00	7.772E+01
1.705382E-02	3.15972E+00	0.0000E+00	0.0000E+00	1.0840E-03	0.000E+00	7.270E+01
1.823053E-02	-2.46801E+00	0.0000E+00	0.0000E+00	1.4418E-03	0.000E+00	6.801E+01
1.842400E-02	-4.82521E+00	0.0000E+00	0.0000E+00	1.5076E-03	0.000E+00	6.729E+01
1.870600E-02	-1.34118E+01	0.0000E+00	0.0000E+00	1.6073E-03	0.000E+00	6.628E+01
1.878120E-02	-2.41391E+01	0.0000E+00	0.0000E+00	1.6346E-03	0.000E+00	6.602E+01
1.889400E-02	-1.22995E+01	2.1336E+01	2.1024E+05	1.6763E-03	0.000E+00	6.562E+01
1.917600E-02	-1.84644E+00	2.0138E+01	1.9552E+05	1.7835E-03	0.000E+00	6.466E+01
1.948844E-02	2.84485E+00	1.8909E+01	1.8064E+05	1.9078E-03	0.000E+00	6.362E+01
2.083314E-02	1.05589E+01	1.4580E+01	1.3030E+05	2.5117E-03	0.000E+00	5.951E+01
2.227063E-02	1.31235E+01	1.1391E+01	9.5222E+04	3.2901E-03	0.000E+00	5.567E+01
2.380730E-02	1.40976E+01	9.0734E+00	7.0955E+04	4.2881E-03	0.000E+00	5.208E+01
2.545001E-02	1.43662E+01	7.3501E+00	5.3769E+04	5.5610E-03	0.000E+00	4.872E+01
2.720606E-02	1.42663E+01	6.0430E+00	4.1353E+04	7.1760E-03	0.000E+00	4.557E+01
2.908327E-02	1.39478E+01	5.0333E+00	3.2220E+04	9.2145E-03	0.000E+00	4.263E+01
3.109002E-02	1.34779E+01	4.2398E+00	2.5389E+04	1.1774E-02	0.000E+00	3.988E+01
3.323523E-02	1.28811E+01	3.6055E+00	2.0197E+04	1.4972E-02	0.000E+00	3.731E+01
3.552846E-02	1.21549E+01	3.0903E+00	1.6194E+04	1.8946E-02	0.000E+00	3.490E+01
3.797993E-02	1.12753E+01	2.6654E+00	1.3066E+04	2.3860E-02	0.000E+00	3.264E+01
4.060054E-02	1.01903E+01	2.3101E+00	1.0593E+04	2.9905E-02	0.000E+00	3.054E+01
4.263000E-02	9.18721E+00	2.0856E+00	9.1084E+03	3.5167E-02	0.000E+00	2.908E+01
4.328250E-02	8.75905E+00	2.0210E+00	8.6930E+03	3.6969E-02	0.000E+00	2.865E+01
4.340198E-02	8.63305E+00	2.0095E+00	8.6198E+03	3.7305E-02	0.000E+00	2.857E+01
4.345650E-02	8.53660E+00	2.0043E+00	8.5867E+03	3.7459E-02	0.000E+00	2.853E+01
4.371750E-02	8.55332E+00	2.2479E+00	9.5727E+03	3.8200E-02	0.000E+00	2.836E+01
4.437000E-02	8.34232E+00	2.1712E+00	9.1102E+03	4.0092E-02	0.000E+00	2.794E+01
4.639671E-02	7.29145E+00	1.9583E+00	7.8579E+03	4.6316E-02	0.000E+00	2.672E+01
4.959809E-02	5.12149E+00	1.6860E+00	6.3285E+03	5.7236E-02	0.000E+00	2.500E+01
5.302035E-02	2.01512E+00	1.4631E+00	5.1377E+03	7.0401E-02	0.000E+00	2.338E+01
5.667876E-02	-2.73805E+00	1.2779E+00	4.1975E+03	8.6195E-02	0.000E+00	2.187E+01
6.058959E-02	-1.11748E+01	1.1219E+00	3.4473E+03	1.0505E-01	0.000E+00	2.046E+01
6.477028E-02	-3.29070E+01	9.8972E-01	2.8448E+03	1.2745E-01	0.000E+00	1.914E+01
6.585600E-02	-4.74805E+01	9.5999E-01	2.7139E+03	1.3364E-01	0.000E+00	1.883E+01
6.686400E-02	-8.44775E+01	9.3385E-01	2.6002E+03	1.3952E-01	0.000E+00	1.854E+01
6.713280E-02	-1.29793E+02	9.2711E-01	2.5711E+03	1.4112E-01	0.000E+00	1.847E+01
6.753600E-02	-8.15129E+01	9.0676E+01	2.4997E+05	1.4352E-01	0.000E+00	1.836E+01
6.854400E-02	-3.86979E+01	8.8107E+01	2.3931E+05	1.4963E-01	0.000E+00	1.809E+01
6.923942E-02	-2.51830E+01	8.6403E+01	2.3233E+05	1.5392E-01	0.000E+00	1.791E+01
7.401695E-02	1.67949E+01	7.6027E+01	1.9123E+05	1.8505E-01	0.000E+00	1.675E+01
7.912411E-02	3.92032E+01	6.2841E+01	1.4786E+05	2.2149E-01	0.000E+00	1.567E+01
8.458368E-02	5.05308E+01	4.7007E+01	1.0347E+05	2.6394E-01	0.000E+00	1.466E+01
9.041995E-02	5.39992E+01	3.2908E+01	6.7758E+04	3.1314E-01	0.000E+00	1.371E+01
9.665893E-02	5.30533E+01	2.2176E+01	4.2713E+04	3.6988E-01	0.000E+00	1.283E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
1.033284E-01	5.01907E+01	1.4723E+01	2.6528E+04	4.3501E-01	0.000E+00	1.200E+01
1.104581E-01	4.68363E+01	9.8130E+00	1.6540E+04	5.0941E-01	0.000E+00	1.122E+01
1.180797E-01	4.36472E+01	6.6634E+00	1.0506E+04	5.9399E-01	0.000E+00	1.050E+01
1.262272E-01	4.08441E+01	4.6603E+00	6.8736E+03	6.8967E-01	0.000E+00	9.822E+00
1.349368E-01	3.84318E+01	3.3818E+00	4.6659E+03	7.9738E-01	0.000E+00	9.188E+00
1.442475E-01	3.62828E+01	2.5563E+00	3.2993E+03	9.1807E-01	0.000E+00	8.595E+00
1.497440E-01	3.50009E+01	2.2257E+00	2.7672E+03	9.9173E-01	0.000E+00	8.280E+00
1.520360E-01	3.41577E+01	2.1119E+00	2.5861E+03	1.0229E+00	0.000E+00	8.155E+00
1.526472E-01	3.34855E+01	2.0835E+00	2.5412E+03	1.0313E+00	0.000E+00	8.122E+00
1.535640E-01	3.39519E+01	3.1829E+00	3.8588E+03	1.0439E+00	0.000E+00	8.074E+00
1.542005E-01	3.40869E+01	3.1487E+00	3.8016E+03	1.0526E+00	0.000E+00	8.040E+00
1.558560E-01	3.41482E+01	3.0639E+00	3.6599E+03	1.0755E+00	0.000E+00	7.955E+00
1.648404E-01	3.35149E+01	2.6858E+00	3.0334E+03	1.2020E+00	0.000E+00	7.521E+00
1.762144E-01	3.24912E+01	2.3545E+00	2.4875E+03	1.3669E+00	0.000E+00	7.036E+00
1.883732E-01	3.14074E+01	2.1264E+00	2.1016E+03	1.5481E+00	0.000E+00	6.582E+00
1.963920E-01	3.05976E+01	2.0219E+00	1.9168E+03	1.6699E+00	0.000E+00	6.313E+00
1.993980E-01	3.00729E+01	1.9897E+00	1.8578E+03	1.7159E+00	0.000E+00	6.218E+00
2.001996E-01	2.96323E+01	1.9817E+00	1.8429E+03	1.7282E+00	0.000E+00	6.193E+00
2.013709E-01	2.99598E+01	2.7326E+00	2.5264E+03	1.7463E+00	0.000E+00	6.157E+00
2.014020E-01	2.99658E+01	2.7320E+00	2.5254E+03	1.7467E+00	0.000E+00	6.156E+00
2.044080E-01	3.01560E+01	2.6690E+00	2.4309E+03	1.7931E+00	0.000E+00	6.066E+00
2.152655E-01	2.97735E+01	2.4791E+00	2.1441E+03	1.9619E+00	0.000E+00	5.760E+00
2.301188E-01	2.89357E+01	2.2949E+00	1.8567E+03	2.1955E+00	0.000E+00	5.388E+00
2.459970E-01	2.78931E+01	2.1714E+00	1.6434E+03	2.4473E+00	0.000E+00	5.040E+00
2.493120E-01	2.76465E+01	2.1525E+00	1.6074E+03	2.5000E+00	0.000E+00	4.973E+00
2.531280E-01	2.73080E+01	2.1331E+00	1.5689E+03	2.5606E+00	0.000E+00	4.898E+00
2.541456E-01	2.71421E+01	2.1284E+00	1.5591E+03	2.5768E+00	0.000E+00	4.878E+00
2.556720E-01	2.71336E+01	2.3106E+00	1.6826E+03	2.6011E+00	0.000E+00	4.849E+00
2.594880E-01	2.69504E+01	2.2969E+00	1.6480E+03	2.6618E+00	0.000E+00	4.778E+00
2.629708E-01	2.67324E+01	2.2861E+00	1.6185E+03	2.7172E+00	0.000E+00	4.715E+00
2.811158E-01	2.53662E+01	2.2513E+00	1.4909E+03	3.0053E+00	0.000E+00	4.410E+00
2.929220E-01	2.42392E+01	2.2434E+00	1.4259E+03	3.1917E+00	0.000E+00	4.233E+00
2.974055E-01	2.36634E+01	2.2427E+00	1.4039E+03	3.2623E+00	0.000E+00	4.169E+00
2.986011E-01	2.33898E+01	2.2426E+00	1.3983E+03	3.2811E+00	0.000E+00	4.152E+00
3.005128E-01	2.33078E+01	2.5373E+00	1.5719E+03	3.3111E+00	0.000E+00	4.126E+00
3.048780E-01	2.29194E+01	2.6178E+00	1.5986E+03	3.3795E+00	0.000E+00	4.067E+00
3.212482E-01	2.09903E+01	3.1454E+00	1.8229E+03	3.6341E+00	0.000E+00	3.859E+00
3.434143E-01	1.79636E+01	4.8261E+00	2.6164E+03	3.9736E+00	0.000E+00	3.610E+00
3.671099E-01	1.49829E+01	8.0373E+00	4.0760E+03	4.3285E+00	0.000E+00	3.377E+00
3.924405E-01	1.29109E+01	1.2796E+01	6.0703E+03	4.6976E+00	0.000E+00	3.159E+00
4.195189E-01	1.25181E+01	1.8539E+01	8.2272E+03	5.0794E+00	0.000E+00	2.955E+00
4.484657E-01	1.40880E+01	2.4348E+01	1.0108E+04	5.4721E+00	0.000E+00	2.765E+00
4.794098E-01	1.73436E+01	2.9352E+01	1.1399E+04	5.8738E+00	0.000E+00	2.586E+00
5.124891E-01	2.16359E+01	3.3006E+01	1.1990E+04	6.2824E+00	0.000E+00	2.419E+00
5.478508E-01	2.61697E+01	3.5155E+01	1.1947E+04	6.6954E+00	0.000E+00	2.263E+00
5.856525E-01	2.98528E+01	3.5931E+01	1.1422E+04	7.1104E+00	0.000E+00	2.117E+00
5.906460E-01	3.00913E+01	3.5945E+01	1.1330E+04	7.1632E+00	0.000E+00	2.099E+00
5.996865E-01	2.97831E+01	3.5927E+01	1.1154E+04	7.2576E+00	0.000E+00	2.067E+00
6.020973E-01	2.85830E+01	3.5914E+01	1.1105E+04	7.2826E+00	0.000E+00	2.059E+00
6.057135E-01	3.03306E+01	3.8693E+01	1.1893E+04	7.3198E+00	0.000E+00	2.047E+00
6.147540E-01	3.23322E+01	3.8664E+01	1.1709E+04	7.4117E+00	0.000E+00	2.017E+00
6.231820E-01	3.34021E+01	3.8600E+01	1.1532E+04	7.4961E+00	0.000E+00	1.990E+00
6.260625E-01	3.36717E+01	3.8571E+01	1.1470E+04	7.5247E+00	0.000E+00	1.980E+00
6.327205E-01	3.39435E+01	3.8491E+01	1.1326E+04	7.5901E+00	0.000E+00	1.960E+00
6.352641E-01	3.33984E+01	3.8457E+01	1.1270E+04	7.6149E+00	0.000E+00	1.952E+00
6.390795E-01	3.47018E+01	4.0085E+01	1.1677E+04	7.6519E+00	0.000E+00	1.940E+00
6.486180E-01	3.65209E+01	3.9968E+01	1.1472E+04	7.7432E+00	0.000E+00	1.912E+00
6.692609E-01	3.91664E+01	3.9633E+01	1.1025E+04	7.9355E+00	0.000E+00	1.853E+00
7.154399E-01	4.36135E+01	3.8566E+01	1.0036E+04	8.3399E+00	0.000E+00	1.733E+00
7.648052E-01	4.71772E+01	3.7140E+01	9.0410E+03	8.7352E+00	0.000E+00	1.621E+00
8.175768E-01	4.99448E+01	3.5513E+01	8.0870E+03	9.1182E+00	0.000E+00	1.516E+00
8.615180E-01	5.12427E+01	3.4184E+01	7.3872E+03	9.4084E+00	0.000E+00	1.439E+00
8.739896E-01	5.09489E+01	3.3818E+01	7.2039E+03	9.4862E+00	0.000E+00	1.419E+00
8.747045E-01	5.08771E+01	3.3798E+01	7.1936E+03	9.4906E+00	0.000E+00	1.417E+00
8.782209E-01	4.99347E+01	3.3696E+01	7.1432E+03	9.5122E+00	0.000E+00	1.412E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 611

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
8.834955E-01	5.12438E+01	3.5673E+01	7.5172E+03	9.5443E+00	0.000E+00	1.403E+00
8.966820E-01	5.27125E+01	3.5296E+01	7.3284E+03	9.6230E+00	0.000E+00	1.383E+00
9.342948E-01	5.49287E+01	3.4255E+01	6.8260E+03	9.8364E+00	0.000E+00	1.327E+00
9.987612E-01	5.74803E+01	3.2619E+01	6.0803E+03	1.0166E+01	0.000E+00	1.241E+00
1.036448E+00	5.87298E+01	3.1583E+01	5.6732E+03	1.0339E+01	0.000E+00	1.196E+00
1.052312E+00	5.90367E+01	3.1143E+01	5.5098E+03	1.0408E+01	0.000E+00	1.178E+00
1.056542E+00	5.89378E+01	3.1027E+01	5.4673E+03	1.0426E+01	0.000E+00	1.173E+00
1.062888E+00	5.93603E+01	3.1298E+01	5.4821E+03	1.0453E+01	0.000E+00	1.166E+00
1.067676E+00	5.95903E+01	3.1168E+01	5.4350E+03	1.0472E+01	0.000E+00	1.161E+00
1.078752E+00	6.00062E+01	3.0867E+01	5.3271E+03	1.0518E+01	0.000E+00	1.149E+00
1.141345E+00	6.16634E+01	2.9203E+01	4.7636E+03	1.0753E+01	0.000E+00	1.086E+00
1.184232E+00	6.24534E+01	2.8162E+01	4.4273E+03	1.0897E+01	0.000E+00	1.047E+00
1.202358E+00	6.25838E+01	2.7700E+01	4.2890E+03	1.0954E+01	0.000E+00	1.031E+00
1.207192E+00	6.23933E+01	2.7560E+01	4.2503E+03	1.0968E+01	0.000E+00	1.027E+00
1.214442E+00	6.28282E+01	2.7909E+01	4.2784E+03	1.0990E+01	0.000E+00	1.021E+00
1.220098E+00	6.30478E+01	2.7749E+01	4.2342E+03	1.1007E+01	0.000E+00	1.016E+00
1.232568E+00	6.33901E+01	2.7403E+01	4.1391E+03	1.1043E+01	0.000E+00	1.006E+00
1.304285E+00	6.46058E+01	2.5570E+01	3.6499E+03	1.1230E+01	0.000E+00	9.506E-01
1.394281E+00	6.55347E+01	2.3613E+01	3.1530E+03	1.1423E+01	0.000E+00	8.892E-01
1.490486E+00	6.61708E+01	2.1852E+01	2.7296E+03	1.1582E+01	0.000E+00	8.318E-01
1.593329E+00	6.65894E+01	2.0239E+01	2.3649E+03	1.1708E+01	0.000E+00	7.781E-01
1.703269E+00	6.68213E+01	1.8778E+01	2.0525E+03	1.1800E+01	0.000E+00	7.279E-01
1.820795E+00	6.68984E+01	1.7458E+01	1.7850E+03	1.1856E+01	0.000E+00	6.809E-01
1.946430E+00	6.68234E+01	1.6264E+01	1.5556E+03	1.1878E+01	0.000E+00	6.370E-01
2.080733E+00	6.65987E+01	1.5184E+01	1.3586E+03	1.1864E+01	0.000E+00	5.959E-01
2.224304E+00	6.62095E+01	1.4196E+01	1.1882E+03	1.1816E+01	0.000E+00	5.574E-01
2.377781E+00	6.55787E+01	1.3297E+01	1.0411E+03	1.1734E+01	0.000E+00	5.214E-01
2.541848E+00	6.45783E+01	1.2395E+01	9.0786E+02	1.1620E+01	0.000E+00	4.878E-01
2.717235E+00	6.28580E+01	1.1492E+01	7.8736E+02	1.1475E+01	0.000E+00	4.563E-01
2.904724E+00	5.95633E+01	1.0670E+01	6.8386E+02	1.1300E+01	0.000E+00	4.268E-01
3.042802E+00	5.41107E+01	1.0073E+01	6.1633E+02	1.1161E+01	0.000E+00	4.075E-01
3.089375E+00	4.86312E+01	9.8388E+00	5.9291E+02	1.1113E+01	0.000E+00	4.013E-01
3.101795E+00	4.32352E+01	9.7780E+00	5.8689E+02	1.1100E+01	0.000E+00	3.997E-01
3.105150E+00	3.52686E+01	1.9240E+01	1.1535E+03	1.1097E+01	0.000E+00	3.993E-01
3.120424E+00	4.69579E+01	1.9588E+01	1.1687E+03	1.1081E+01	0.000E+00	3.973E-01
3.166998E+00	4.93188E+01	2.0762E+01	1.2205E+03	1.1031E+01	0.000E+00	3.915E-01
3.183432E+00	4.93430E+01	2.1218E+01	1.2409E+03	1.1014E+01	0.000E+00	3.895E-01
3.232158E+00	4.72821E+01	2.2710E+01	1.3081E+03	1.0962E+01	0.000E+00	3.836E-01
3.245152E+00	4.35093E+01	2.3144E+01	1.3278E+03	1.0948E+01	0.000E+00	3.821E-01
3.264642E+00	4.83772E+01	3.1979E+01	1.8237E+03	1.0927E+01	0.000E+00	3.798E-01
3.313368E+00	5.38904E+01	3.2609E+01	1.8323E+03	1.0874E+01	0.000E+00	3.749E-01
3.319406E+00	5.43343E+01	3.2679E+01	1.8328E+03	1.0868E+01	0.000E+00	3.735E-01
3.548445E+00	6.56943E+01	3.2620E+01	1.7114E+03	1.0615E+01	0.000E+00	3.494E-01
3.715964E+00	6.93459E+01	2.9903E+01	1.4982E+03	1.0427E+01	0.000E+00	3.337E-01
3.772841E+00	6.86600E+01	2.8839E+01	1.4231E+03	1.0363E+01	0.000E+00	3.286E-01
3.788008E+00	6.66722E+01	2.8552E+01	1.4033E+03	1.0346E+01	0.000E+00	3.273E-01
3.793288E+00	6.53654E+01	3.2940E+01	1.6167E+03	1.0340E+01	0.000E+00	3.269E-01
3.810759E+00	6.93374E+01	3.2596E+01	1.5925E+03	1.0321E+01	0.000E+00	3.254E-01
3.867636E+00	7.22537E+01	3.1480E+01	1.5153E+03	1.0257E+01	0.000E+00	3.206E-01
4.055024E+00	7.58238E+01	2.8092E+01	1.2898E+03	1.0047E+01	0.000E+00	3.058E-01
4.334821E+00	7.6224E+01	2.4576E+01	1.0555E+03	9.7363E+00	0.000E+00	2.860E-01
4.399710E+00	7.76921E+01	2.3918E+01	1.0121E+03	9.6651E+00	0.000E+00	2.818E-01
4.467053E+00	7.73105E+01	2.3279E+01	9.7022E+02	9.5916E+00	0.000E+00	2.776E-01
4.485011E+00	7.65936E+01	2.3116E+01	9.5956E+02	9.5720E+00	0.000E+00	2.764E-01
4.511948E+00	7.74580E+01	2.4413E+01	1.0074E+03	9.5428E+00	0.000E+00	2.748E-01
4.579290E+00	7.83519E+01	2.3832E+01	9.6893E+02	9.4700E+00	0.000E+00	2.707E-01
4.633924E+00	7.87179E+01	2.3386E+01	9.3956E+02	9.4113E+00	0.000E+00	2.676E-01
4.725560E+00	7.90682E+01	2.2685E+01	8.9371E+02	9.3135E+00	0.000E+00	2.624E-01
4.797890E+00	7.89868E+01	2.2171E+01	8.6031E+02	9.2370E+00	0.000E+00	2.584E-01
4.817178E+00	7.85626E+01	2.2039E+01	8.5177E+02	9.2167E+00	0.000E+00	2.574E-01
4.846110E+00	7.91937E+01	2.2844E+01	8.7761E+02	9.1864E+00	0.000E+00	2.558E-01
4.918440E+00	7.99275E+01	2.2377E+01	8.4702E+02	9.1108E+00	0.000E+00	2.521E-01
4.953664E+00	8.01590E+01	2.2156E+01	8.3269E+02	9.0743E+00	0.000E+00	2.503E-01
5.295467E+00	8.15932E+01	2.0246E+01	7.1181E+02	8.7277E+00	0.000E+00	2.341E-01
5.660855E+00	8.25725E+01	1.8561E+01	6.1044E+02	8.3737E+00	0.000E+00	2.190E-01

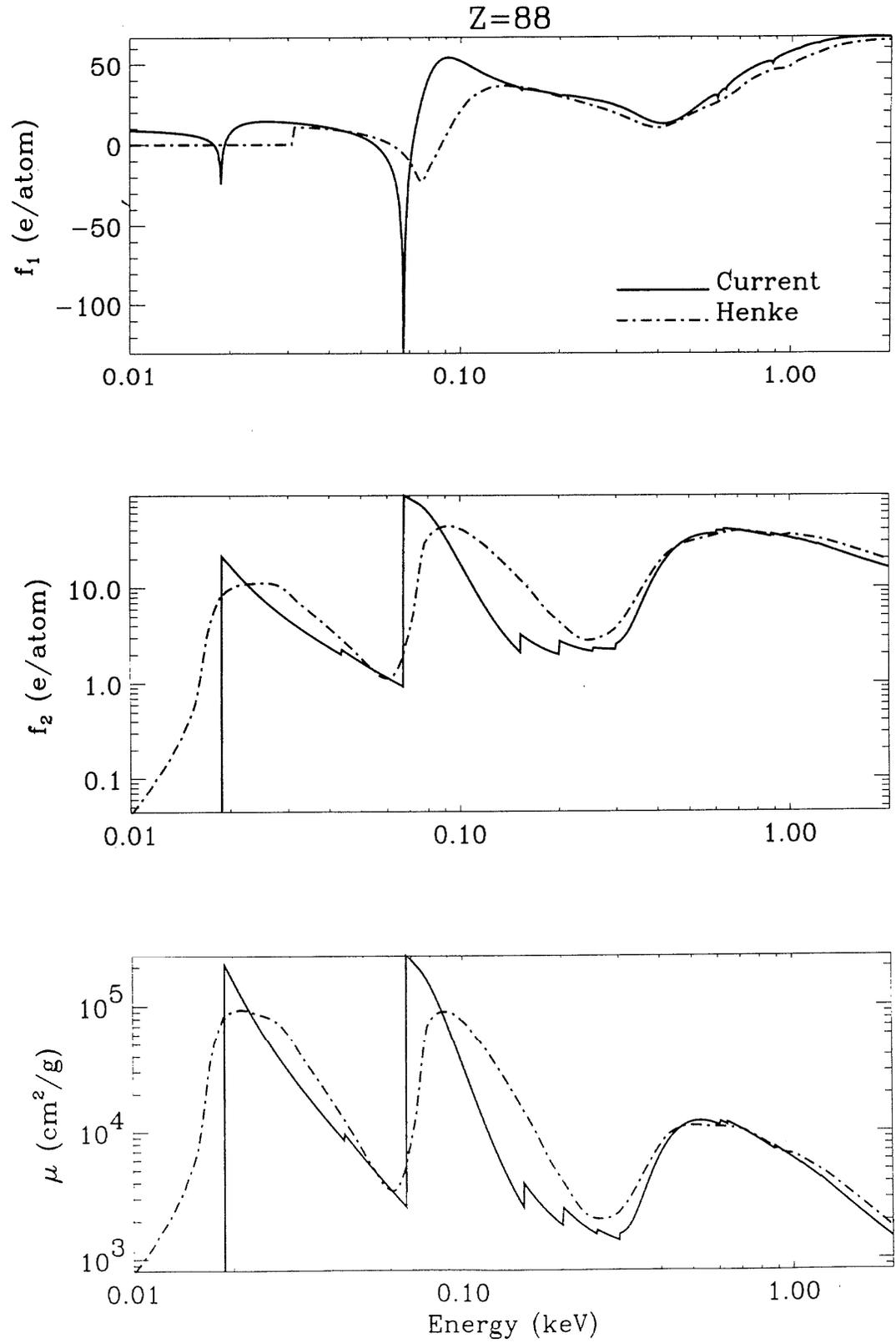
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

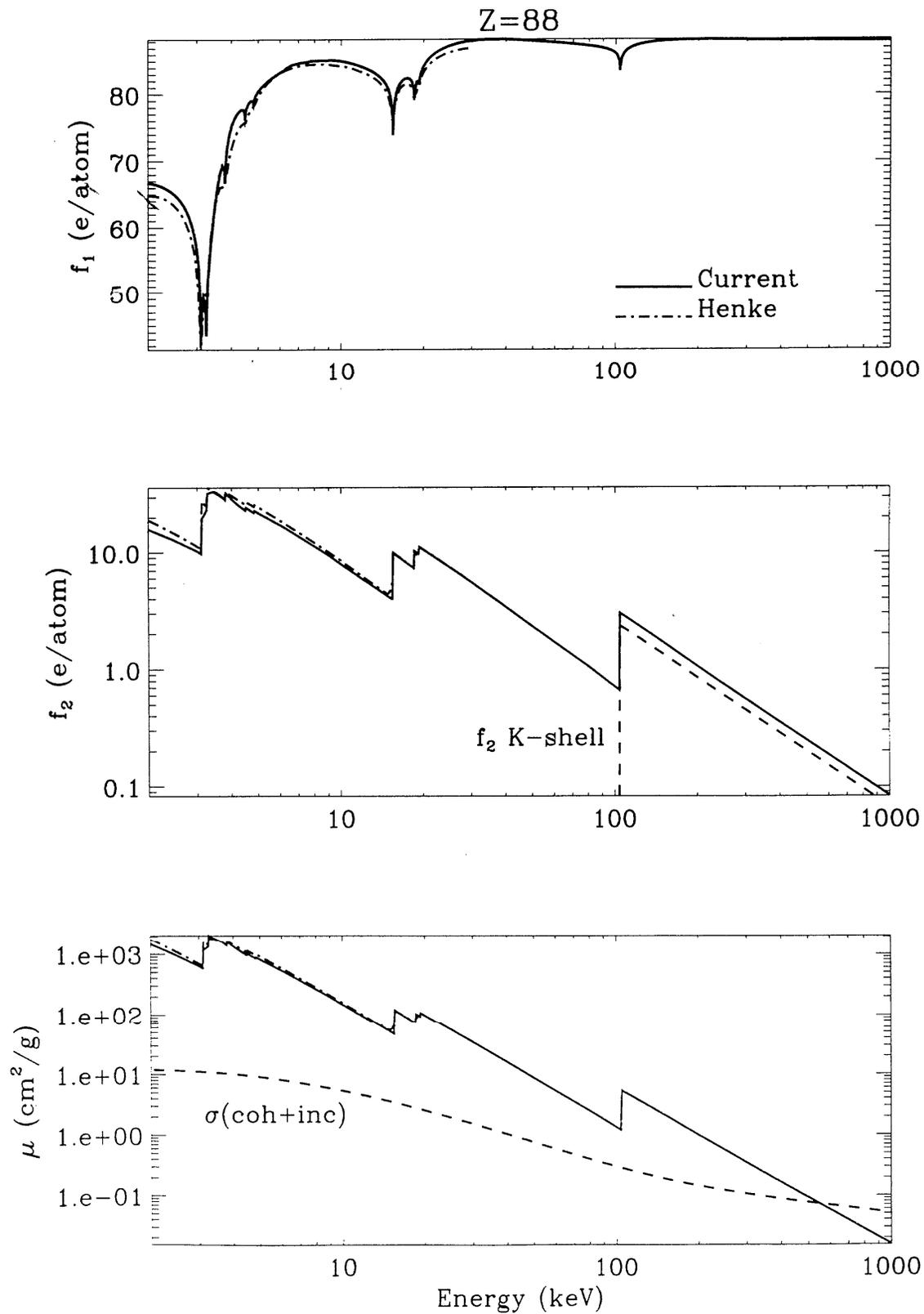
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.051453E+00	8.33581E+01	1.7005E+01	5.2318E+02	8.0148E+00	0.000E+00	2.049E-01
6.469004E+00	8.41458E+01	1.5475E+01	4.4536E+02	7.6530E+00	0.000E+00	1.917E-01
6.915365E+00	8.46437E+01	1.3996E+01	3.7681E+02	7.2905E+00	0.000E+00	1.793E-01
7.392525E+00	8.48605E+01	1.2678E+01	3.1928E+02	6.9292E+00	0.000E+00	1.677E-01
7.902609E+00	8.50647E+01	1.1489E+01	2.7066E+02	6.5708E+00	0.000E+00	1.569E-01
8.447890E+00	8.50959E+01	1.0421E+01	2.2966E+02	6.2171E+00	0.000E+00	1.468E-01
9.030794E+00	8.51707E+01	9.4348E+00	1.9451E+02	5.8697E+00	0.000E+00	1.373E-01
9.653919E+00	8.51076E+01	8.4372E+00	1.6271E+02	5.5297E+00	0.000E+00	1.284E-01
1.032004E+01	8.48921E+01	7.5506E+00	1.3621E+02	5.1985E+00	0.000E+00	1.201E-01
1.103212E+01	8.45849E+01	6.7682E+00	1.1422E+02	4.8771E+00	0.000E+00	1.124E-01
1.179334E+01	8.41863E+01	6.0735E+00	9.5879E+01	4.5663E+00	0.000E+00	1.051E-01
1.260708E+01	8.36659E+01	5.4548E+00	8.0554E+01	4.2669E+00	0.000E+00	9.834E-02
1.347697E+01	8.29402E+01	4.9064E+00	6.7779E+01	3.9795E+00	0.000E+00	9.200E-02
1.440688E+01	8.17231E+01	4.4059E+00	5.6935E+01	3.7045E+00	0.000E+00	8.606E-02
1.513551E+01	7.94783E+01	4.0707E+00	5.0072E+01	3.5094E+00	0.000E+00	8.192E-02
1.536718E+01	7.69041E+01	3.9736E+00	4.8141E+01	3.4507E+00	0.000E+00	8.068E-02
1.540095E+01	7.58263E+01	3.9598E+00	4.7869E+01	3.4423E+00	0.000E+00	8.050E-02
1.542896E+01	7.38766E+01	3.9485E+00	4.7644E+01	3.4353E+00	0.000E+00	8.036E-02
1.552162E+01	7.68957E+01	9.8368E+00	1.1799E+02	3.4125E+00	0.000E+00	7.988E-02
1.575329E+01	7.95752E+01	9.6041E+00	1.1350E+02	3.3563E+00	0.000E+00	7.870E-02
1.646362E+01	8.17385E+01	8.9362E+00	1.0105E+02	3.1930E+00	0.000E+00	7.531E-02
1.759961E+01	8.23754E+01	7.9674E+00	8.4282E+01	2.9567E+00	0.000E+00	7.045E-02
1.811461E+01	8.18554E+01	7.5791E+00	7.7895E+01	2.8586E+00	0.000E+00	6.844E-02
1.839188E+01	8.06326E+01	7.3820E+00	7.4726E+01	2.8079E+00	0.000E+00	6.741E-02
1.846582E+01	7.91067E+01	7.3308E+00	7.3910E+01	2.7947E+00	0.000E+00	6.714E-02
1.857672E+01	8.06413E+01	1.0265E+01	1.0287E+02	2.7749E+00	0.000E+00	6.674E-02
1.881398E+01	8.18406E+01	1.0055E+01	9.9499E+01	2.7335E+00	0.000E+00	6.590E-02
1.885197E+01	8.19278E+01	1.0022E+01	9.8973E+01	2.7269E+00	0.000E+00	6.577E-02
1.885399E+01	8.19320E+01	1.0020E+01	9.8945E+01	2.7266E+00	0.000E+00	6.576E-02
1.914052E+01	8.20105E+01	9.7772E+00	9.5101E+01	2.6780E+00	0.000E+00	6.478E-02
1.921746E+01	8.13891E+01	9.7136E+00	9.4104E+01	2.6652E+00	0.000E+00	6.452E-02
1.933288E+01	8.23574E+01	1.1132E+01	1.0720E+02	2.6461E+00	0.000E+00	6.413E-02
1.962143E+01	8.34660E+01	1.0888E+01	1.0330E+02	2.5995E+00	0.000E+00	6.319E-02
2.011215E+01	8.44292E+01	1.0488E+01	9.7085E+01	2.5231E+00	0.000E+00	6.165E-02
2.149988E+01	8.58910E+01	9.4546E+00	8.1871E+01	2.3254E+00	0.000E+00	5.767E-02
2.298338E+01	8.67343E+01	8.5164E+00	6.8987E+01	2.1402E+00	0.000E+00	5.395E-02
2.456923E+01	8.72884E+01	7.6729E+00	5.8142E+01	1.9670E+00	0.000E+00	5.046E-02
2.626450E+01	8.76735E+01	6.9145E+00	4.9014E+01	1.8056E+00	0.000E+00	4.721E-02
2.807676E+01	8.79564E+01	6.1939E+00	4.1071E+01	1.6555E+00	0.000E+00	4.416E-02
3.001405E+01	8.81213E+01	5.5414E+00	3.4373E+01	1.5162E+00	0.000E+00	4.131E-02
3.208502E+01	8.82735E+01	4.9538E+00	2.8745E+01	1.3873E+00	0.000E+00	3.864E-02
3.429889E+01	8.83117E+01	4.4274E+00	2.4032E+01	1.2683E+00	0.000E+00	3.615E-02
3.666551E+01	8.83147E+01	3.9611E+00	2.0113E+01	1.1586E+00	0.000E+00	3.381E-02
3.919543E+01	8.83551E+01	3.5365E+00	1.6798E+01	1.0578E+00	0.000E+00	3.163E-02
4.189992E+01	8.83080E+01	3.1512E+00	1.4002E+01	9.6526E-01	0.000E+00	2.959E-02
4.479101E+01	8.82421E+01	2.8100E+00	1.1680E+01	8.8053E-01	0.000E+00	2.768E-02
4.788159E+01	8.81644E+01	2.5077E+00	9.7504E+00	8.0309E-01	0.000E+00	2.589E-02
5.118542E+01	8.80786E+01	2.2396E+00	8.1460E+00	7.3243E-01	0.000E+00	2.422E-02
5.471721E+01	8.79870E+01	2.0017E+00	6.8107E+00	6.6809E-01	0.000E+00	2.266E-02
5.849270E+01	8.78906E+01	1.7904E+00	5.6985E+00	6.0959E-01	0.000E+00	2.120E-02
6.252870E+01	8.77896E+01	1.6026E+00	4.7716E+00	5.5648E-01	0.000E+00	1.983E-02
6.684318E+01	8.76832E+01	1.4355E+00	3.9983E+00	5.0835E-01	0.000E+00	1.855E-02
7.145536E+01	8.75680E+01	1.2843E+00	3.3462E+00	4.6478E-01	0.000E+00	1.735E-02
7.638578E+01	8.74390E+01	1.1500E+00	2.8028E+00	4.2540E-01	0.000E+00	1.623E-02
8.165640E+01	8.72913E+01	1.0274E+00	2.3426E+00	3.8984E-01	0.000E+00	1.518E-02
8.729069E+01	8.70947E+01	9.1053E-01	1.9420E+00	3.5775E-01	0.000E+00	1.420E-02
9.331374E+01	8.67978E+01	8.0675E-01	1.6096E+00	3.2884E-01	0.000E+00	1.329E-02
9.975239E+01	8.61750E+01	7.1532E-01	1.3351E+00	3.0280E-01	0.000E+00	1.243E-02
1.018435E+02	8.56929E+01	6.8916E-01	1.2598E+00	2.9525E-01	0.000E+00	1.217E-02
1.034023E+02	8.46943E+01	6.7065E-01	1.2075E+00	2.8987E-01	0.000E+00	1.199E-02
1.038180E+02	8.35001E+01	6.6584E-01	1.1940E+00	2.8847E-01	0.000E+00	1.194E-02
1.044415E+02	8.47442E+01	3.0084E+00	5.3627E+00	2.8640E-01	4.188E+00	1.187E-02
1.060003E+02	8.58317E+01	2.9405E+00	5.1646E+00	2.8136E-01	4.038E+00	1.170E-02
1.066353E+02	8.60452E+01	2.9136E+00	5.0868E+00	2.7936E-01	3.979E+00	1.163E-02
1.139931E+02	8.71022E+01	2.6266E+00	4.2898E+00	2.5827E-01	3.369E+00	1.088E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 613

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
1.218587E+02	8.75403E+01	2.3654E+00	3.6138E+00	2.3929E-01	2.849E+00	1.017E-02
1.302669E+02	8.77977E+01	2.1279E+00	3.0412E+00	2.2221E-01	2.405E+00	9.518E-03
1.392553E+02	8.79644E+01	1.9137E+00	2.5585E+00	2.0684E-01	2.029E+00	8.903E-03
1.488640E+02	8.80774E+01	1.7206E+00	2.1518E+00	1.9299E-01	1.711E+00	8.329E-03
1.591356E+02	8.81537E+01	1.5450E+00	1.8075E+00	1.8051E-01	1.440E+00	7.791E-03
1.701159E+02	8.82040E+01	1.3874E+00	1.5183E+00	1.6924E-01	1.212E+00	7.288E-03
1.818539E+02	8.82362E+01	1.2459E+00	1.2755E+00	1.5906E-01	1.020E+00	6.818E-03
1.944018E+02	8.82551E+01	1.1189E+00	1.0715E+00	1.4984E-01	8.579E-01	6.378E-03
2.078156E+02	8.82645E+01	1.0049E+00	9.0030E-01	1.4147E-01	7.218E-01	5.966E-03
2.221548E+02	8.82666E+01	9.0294E-01	7.5670E-01	1.3386E-01	6.075E-01	5.581E-03
2.374835E+02	8.82640E+01	8.1164E-01	6.3628E-01	1.2692E-01	5.115E-01	5.221E-03
2.538699E+02	8.82578E+01	7.2965E-01	5.3509E-01	1.2057E-01	4.306E-01	4.884E-03
2.713869E+02	8.82490E+01	6.5603E-01	4.5004E-01	1.1475E-01	3.626E-01	4.569E-03
2.901126E+02	8.82385E+01	5.8989E-01	3.7855E-01	1.0938E-01	3.053E-01	4.274E-03
3.101304E+02	8.82269E+01	5.3048E-01	3.1845E-01	1.0442E-01	2.570E-01	3.998E-03
3.315294E+02	8.82146E+01	4.7710E-01	2.6792E-01	9.9813E-02	2.164E-01	3.740E-03
3.544049E+02	8.82020E+01	4.2914E-01	2.2543E-01	9.5525E-02	1.822E-01	3.498E-03
3.788588E+02	8.81893E+01	3.8603E-01	1.8970E-01	9.1515E-02	1.534E-01	3.273E-03
4.050001E+02	8.81767E+01	3.4728E-01	1.5964E-01	8.7751E-02	1.292E-01	3.061E-03
4.329451E+02	8.81645E+01	3.1246E-01	1.3436E-01	8.4204E-02	1.087E-01	2.864E-03





Ac Z = 89

Atomic weight = 2.270278E+02 g/mol, nominal density ρ (g/cm³) = 1.0050E+01 μ_a (barns/atom) = μ (cm²/g) \times 3.76989E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.85353E+05

24 edges. Edge energies (keV):

K		1.06755E+02	L	I	1.98400E+00	L	II	1.90832E+00	L	III	1.58710E+01
M	ζ	5.00200E+00	M	II	4.65600E+00	M	III	3.90900E+00	M	IV	3.37020E+00
M	V	3.21900E+00	N	I	1.26900E+00	N	II	1.08000E+00	N	III	8.90000E-01
N	IV	6.74900E-00	N	V	6.37000E-00	N	VI	3.03944E-00	N	VII	2.95067E-01
O	I	2.61255E-00	O	II	2.06171E-00	O	III	1.63235E-00	O	IV	8.31361E-02
O	V	7.69389E-02	P	I	4.04636E-02	P	II	2.51851E-02	P	III	1.84021E-02

Relativistic correction estimate f_{rel} (H82,3/5SCL) = -2.3597E+00, -1.3722E+00 e/atomNuclear Thomson correction f_{NT} = 1.9140E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	1.98738E+01	0.0000E+00	0.0000E+00	1.2142E-04	0.000E+00	1.160E+02
1.142761E-02	1.97310E+01	0.0000E+00	0.0000E+00	1.6777E-04	0.000E+00	1.085E+02
1.221612E-02	1.95519E+01	0.0000E+00	0.0000E+00	2.3056E-04	0.000E+00	1.015E+02
1.305903E-02	1.93217E+01	0.0000E+00	0.0000E+00	3.1518E-04	0.000E+00	9.494E+01
1.396010E-02	1.90154E+01	0.0000E+00	0.0000E+00	4.2858E-04	0.000E+00	8.881E+01
1.492335E-02	1.85856E+01	0.0000E+00	0.0000E+00	5.7971E-04	0.000E+00	8.308E+01
1.595306E-02	1.79255E+01	0.0000E+00	0.0000E+00	7.8006E-04	0.000E+00	7.772E+01
1.705382E-02	1.67021E+01	0.0000E+00	0.0000E+00	1.0442E-03	0.000E+00	7.270E+01
1.803405E-02	1.36882E+01	0.0000E+00	0.0000E+00	1.3278E-03	0.000E+00	6.875E+01
1.823053E-02	1.17526E+01	0.0000E+00	0.0000E+00	1.3906E-03	0.000E+00	6.801E+01
1.831008E-02	1.01151E+01	0.0000E+00	0.0000E+00	1.4165E-03	0.000E+00	6.771E+01
1.838369E-02	5.74963E+00	0.0000E+00	0.0000E+00	1.4409E-03	0.000E+00	6.744E+01
1.849410E-02	1.04311E+01	8.6357E+00	8.6550E+04	1.4780E-03	0.000E+00	6.704E+01
1.877013E-02	1.45434E+01	8.2993E+00	8.1955E+04	1.5735E-03	0.000E+00	6.605E+01
1.948844E-02	1.78163E+01	7.5041E+00	7.1371E+04	1.8423E-03	0.000E+00	6.362E+01
2.083314E-02	1.99561E+01	6.2727E+00	5.5808E+04	2.4285E-03	0.000E+00	5.951E+01
2.227063E-02	2.06820E+01	5.2323E+00	4.3547E+04	3.1848E-03	0.000E+00	5.567E+01
2.380730E-02	2.04120E+01	4.3595E+00	3.3941E+04	4.1558E-03	0.000E+00	5.208E+01
2.468140E-02	1.92537E+01	3.9502E+00	2.9665E+04	4.7885E-03	0.000E+00	5.023E+01
2.505918E-02	1.72280E+01	3.7897E+00	2.8031E+04	5.0809E-03	0.000E+00	4.948E+01
2.515992E-02	1.46607E+01	3.7485E+00	2.7615E+04	5.1608E-03	0.000E+00	4.928E+01
2.531103E-02	1.74902E+01	8.8114E+00	6.4526E+04	5.2823E-03	0.000E+00	4.898E+01
2.545001E-02	1.88207E+01	8.6675E+00	6.3126E+04	5.3956E-03	0.000E+00	4.872E+01
2.568880E-02	2.00133E+01	8.4277E+00	6.0808E+04	5.5942E-03	0.000E+00	4.826E+01
2.720606E-02	2.26397E+01	7.0963E+00	4.8347E+04	6.9706E-03	0.000E+00	4.557E+01
2.908327E-02	2.36170E+01	5.8464E+00	3.7260E+04	8.9608E-03	0.000E+00	4.263E+01
3.109002E-02	2.39791E+01	4.9015E+00	2.9222E+04	1.1463E-02	0.000E+00	3.988E+01
3.323523E-02	2.40796E+01	4.1683E+00	2.3247E+04	1.4592E-02	0.000E+00	3.731E+01
3.552846E-02	2.40336E+01	3.5844E+00	1.8700E+04	1.8485E-02	0.000E+00	3.490E+01
3.797993E-02	2.38786E+01	3.1087E+00	1.5172E+04	2.3304E-02	0.000E+00	3.264E+01
3.965432E-02	2.36941E+01	2.8454E+00	1.3300E+04	2.7000E-02	0.000E+00	3.127E+01
4.026127E-02	2.35483E+01	2.7596E+00	1.2705E+04	2.8423E-02	0.000E+00	3.079E+01
4.042313E-02	2.34121E+01	2.7375E+00	1.2552E+04	2.8810E-02	0.000E+00	3.067E+01
4.060054E-02	2.35007E+01	2.9602E+00	1.3514E+04	2.9238E-02	0.000E+00	3.054E+01
4.066591E-02	2.35279E+01	2.9500E+00	1.3446E+04	2.9397E-02	0.000E+00	3.049E+01
4.127286E-02	2.35965E+01	2.8585E+00	1.2837E+04	3.0895E-02	0.000E+00	3.004E+01
4.340198E-02	2.35120E+01	2.5728E+00	1.0987E+04	3.6510E-02	0.000E+00	2.857E+01
4.639671E-02	2.32370E+01	2.2463E+00	8.9737E+03	4.5375E-02	0.000E+00	2.672E+01
4.959809E-02	2.28483E+01	1.9720E+00	7.3694E+03	5.6128E-02	0.000E+00	2.500E+01
5.302035E-02	2.23395E+01	1.7381E+00	6.0764E+03	6.9106E-02	0.000E+00	2.338E+01
5.667876E-02	2.16788E+01	1.5367E+00	5.0255E+03	8.4691E-02	0.000E+00	2.187E+01
6.058959E-02	2.07723E+01	1.3621E+00	4.1670E+03	1.0331E-01	0.000E+00	2.046E+01
6.477028E-02	1.94632E+01	1.2104E+00	3.4638E+03	1.2545E-01	0.000E+00	1.914E+01
6.923942E-02	1.73383E+01	1.0785E+00	2.8871E+03	1.5165E-01	0.000E+00	1.791E+01
7.401695E-02	1.26956E+01	9.6397E-01	2.4140E+03	1.8249E-01	0.000E+00	1.675E+01
7.540014E-02	9.64471E+00	9.3502E-01	2.2985E+03	1.9196E-01	0.000E+00	1.644E+01
7.655423E-02	3.21458E+00	9.1214E-01	2.2085E+03	2.0004E-01	0.000E+00	1.620E+01
7.686198E-02	-4.10506E+00	9.0623E-01	2.1854E+03	2.0222E-01	0.000E+00	1.613E+01
7.732361E-02	3.08047E+00	1.5066E+01	3.6115E+04	2.0552E-01	0.000E+00	1.603E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 617

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
7.847770E-02	9.02096E+00	1.4994E+01	3.5415E+04	2.1387E-01	0.000E+00	1.580E+01
7.912411E-02	1.03552E+01	1.4955E+01	3.5033E+04	2.1862E-01	0.000E+00	1.567E+01
8.147337E-02	1.18469E+01	1.4817E+01	3.3710E+04	2.3631E-01	0.000E+00	1.522E+01
8.272042E-02	9.52342E+00	1.4747E+01	3.3044E+04	2.4597E-01	0.000E+00	1.499E+01
8.305296E-02	5.52554E+00	1.4729E+01	3.2871E+04	2.4858E-01	0.000E+00	1.493E+01
8.355176E-02	1.03287E+01	2.3173E+01	5.1408E+04	2.5251E-01	0.000E+00	1.484E+01
8.458368E-02	1.46493E+01	2.3176E+01	5.0787E+04	2.6074E-01	0.000E+00	1.466E+01
8.479882E-02	1.52205E+01	2.3176E+01	5.0659E+04	2.6247E-01	0.000E+00	1.462E+01
9.041995E-02	2.39206E+01	2.2422E+01	4.5962E+04	3.0960E-01	0.000E+00	1.371E+01
9.665893E-02	2.97628E+01	2.0186E+01	3.8708E+04	3.6601E-01	0.000E+00	1.283E+01
1.033284E-01	3.34927E+01	1.6702E+01	2.9961E+04	4.3082E-01	0.000E+00	1.200E+01
1.104581E-01	3.52903E+01	1.3035E+01	2.1873E+04	5.0491E-01	0.000E+00	1.122E+01
1.180797E-01	3.57040E+01	9.8284E+00	1.5428E+04	5.8920E-01	0.000E+00	1.050E+01
1.262272E-01	3.52888E+01	7.3068E+00	1.0729E+04	6.8464E-01	0.000E+00	9.822E+00
1.349368E-01	3.44492E+01	5.4453E+00	7.4799E+03	7.9218E-01	0.000E+00	9.188E+00
1.442475E-01	3.34164E+01	4.1195E+00	5.2934E+03	9.1277E-01	0.000E+00	8.595E+00
1.542005E-01	3.22488E+01	3.1919E+00	3.8367E+03	1.0473E+00	0.000E+00	8.040E+00
1.599698E-01	3.14171E+01	2.8080E+00	3.2535E+03	1.1277E+00	0.000E+00	7.750E+00
1.624183E-01	3.07548E+01	2.6703E+00	3.0474E+03	1.1623E+00	0.000E+00	7.634E+00
1.630713E-01	3.01621E+01	2.6338E+00	2.9960E+03	1.1716E+00	0.000E+00	7.603E+00
1.640507E-01	3.06338E+01	3.6417E+00	4.1145E+03	1.1855E+00	0.000E+00	7.558E+00
1.648404E-01	3.08022E+01	3.5977E+00	4.0454E+03	1.1968E+00	0.000E+00	7.521E+00
1.664992E-01	3.09145E+01	3.5094E+00	3.9067E+03	1.2205E+00	0.000E+00	7.447E+00
1.762144E-01	3.06429E+01	3.0824E+00	3.2423E+03	1.3619E+00	0.000E+00	7.036E+00
1.883732E-01	2.99615E+01	2.7103E+00	2.6668E+03	1.5436E+00	0.000E+00	6.582E+00
2.013709E-01	2.90378E+01	2.4479E+00	2.2532E+03	1.7423E+00	0.000E+00	6.157E+00
2.020480E-01	2.89721E+01	2.4370E+00	2.2356E+03	1.7528E+00	0.000E+00	6.136E+00
2.051405E-01	2.85233E+01	2.3900E+00	2.1595E+03	1.8007E+00	0.000E+00	6.044E+00
2.059652E-01	2.81320E+01	2.3782E+00	2.1402E+03	1.8135E+00	0.000E+00	6.020E+00
2.072023E-01	2.84398E+01	3.0481E+00	2.767E+03	1.8328E+00	0.000E+00	5.984E+00
2.102948E-01	2.86015E+01	2.9782E+00	2.6250E+03	1.8810E+00	0.000E+00	5.896E+00
2.152655E-01	2.85224E+01	2.8768E+00	2.4770E+03	1.9589E+00	0.000E+00	5.760E+00
2.301188E-01	2.79004E+01	2.6390E+00	2.1256E+03	2.1935E+00	0.000E+00	5.388E+00
2.459970E-01	2.70176E+01	2.4705E+00	1.8615E+03	2.4466E+00	0.000E+00	5.040E+00
2.560302E-01	2.63471E+01	2.3966E+00	1.7350E+03	2.6071E+00	0.000E+00	4.843E+00
2.599490E-01	2.60025E+01	2.3730E+00	1.6920E+03	2.6698E+00	0.000E+00	4.770E+00
2.609940E-01	2.58305E+01	2.3671E+00	1.6811E+03	2.6866E+00	0.000E+00	4.750E+00
2.625616E-01	2.58246E+01	2.5572E+00	1.8052E+03	2.7116E+00	0.000E+00	4.722E+00
2.629708E-01	2.58135E+01	2.5552E+00	1.8010E+03	2.7182E+00	0.000E+00	4.715E+00
2.664804E-01	2.56364E+01	2.5393E+00	1.7663E+03	2.7744E+00	0.000E+00	4.653E+00
2.811158E-01	2.45672E+01	2.4903E+00	1.6419E+03	3.0082E+00	0.000E+00	4.410E+00
2.891658E-01	2.38229E+01	2.4729E+00	1.5851E+03	3.1364E+00	0.000E+00	4.288E+00
2.935918E-01	2.33060E+01	2.4656E+00	1.5566E+03	3.2067E+00	0.000E+00	4.223E+00
2.947720E-01	2.30852E+01	2.4639E+00	1.5493E+03	3.2254E+00	0.000E+00	4.206E+00
2.965424E-01	2.29742E+01	2.6560E+00	1.6602E+03	3.2535E+00	0.000E+00	4.181E+00
2.978648E-01	2.28596E+01	2.6690E+00	1.6609E+03	3.2744E+00	0.000E+00	4.162E+00
3.005128E-01	2.25818E+01	2.6985E+00	1.6644E+03	3.3163E+00	0.000E+00	4.126E+00
3.009684E-01	2.25289E+01	2.7041E+00	1.6653E+03	3.3235E+00	0.000E+00	4.120E+00
3.024240E-01	2.23454E+01	2.7229E+00	1.6689E+03	3.3465E+00	0.000E+00	4.100E+00
3.036397E-01	2.21388E+01	2.7400E+00	1.6726E+03	3.3657E+00	0.000E+00	4.083E+00
3.054634E-01	2.19987E+01	2.9188E+00	1.7711E+03	3.3945E+00	0.000E+00	4.059E+00
3.100226E-01	2.15241E+01	3.0429E+00	1.8193E+03	3.4663E+00	0.000E+00	3.999E+00
3.12482E-01	2.01342E+01	3.5042E+00	2.0219E+03	3.6421E+00	0.000E+00	3.859E+00
3.434143E-01	1.70858E+01	5.3640E+00	2.8952E+03	3.9846E+00	0.000E+00	3.610E+00
3.671099E-01	1.41668E+01	8.8327E+00	4.4596E+03	4.3430E+00	0.000E+00	3.377E+00
3.924405E-01	1.22832E+01	1.3853E+01	6.5428E+03	4.7160E+00	0.000E+00	3.159E+00
4.195189E-01	1.21882E+01	1.9787E+01	8.7423E+03	5.1021E+00	0.000E+00	2.955E+00
4.484657E-01	1.41098E+01	2.5675E+01	1.0612E+04	5.4995E+00	0.000E+00	2.765E+00
4.794098E-01	1.77163E+01	3.0651E+01	1.1851E+04	5.9063E+00	0.000E+00	2.586E+00
5.124891E-01	2.23409E+01	3.4206E+01	1.2371E+04	6.3204E+00	0.000E+00	2.419E+00
5.478508E-01	2.72355E+01	3.6224E+01	1.2256E+04	6.7394E+00	0.000E+00	2.263E+00
5.856525E-01	3.16964E+01	3.6870E+01	1.1669E+04	7.1607E+00	0.000E+00	2.117E+00
6.242600E-01	3.44780E+01	3.6478E+01	1.0831E+04	7.5634E+00	0.000E+00	1.986E+00
6.260625E-01	3.44934E+01	3.6442E+01	1.0789E+04	7.5816E+00	0.000E+00	1.980E+00
6.338150E-01	3.39618E+01	3.6272E+01	1.0607E+04	7.6590E+00	0.000E+00	1.956E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.363630E-01	3.26056E+01	3.6211E+01	1.0547E+04	7.6842E+00	0.000E+00	1.948E+00
6.401850E-01	3.44394E+01	3.9169E+01	1.1341E+04	7.7217E+00	0.000E+00	1.937E+00
6.497400E-01	3.64485E+01	3.8978E+01	1.1119E+04	7.8146E+00	0.000E+00	1.908E+00
6.614020E-01	3.77142E+01	3.8711E+01	1.0849E+04	7.9257E+00	0.000E+00	1.875E+00
6.692609E-01	3.81102E+01	3.8515E+01	1.0667E+04	7.9993E+00	0.000E+00	1.853E+00
6.715255E-01	3.80509E+01	3.8456E+01	1.0615E+04	8.0203E+00	0.000E+00	1.846E+00
6.742251E-01	3.73808E+01	3.8385E+01	1.0553E+04	8.0452E+00	0.000E+00	1.839E+00
6.782745E-01	3.87307E+01	4.0142E+01	1.0970E+04	8.0824E+00	0.000E+00	1.828E+00
6.883980E-01	4.05137E+01	3.9903E+01	1.0744E+04	8.1741E+00	0.000E+00	1.801E+00
7.154399E-01	4.34555E+01	3.9208E+01	1.0158E+04	8.4109E+00	0.000E+00	1.733E+00
7.648052E-01	4.73026E+01	3.7788E+01	9.1579E+03	8.8135E+00	0.000E+00	1.621E+00
8.175768E-01	5.02573E+01	3.6177E+01	8.2016E+03	9.2041E+00	0.000E+00	1.516E+00
8.722000E-01	5.20189E+01	3.4545E+01	7.3412E+03	9.5685E+00	0.000E+00	1.422E+00
8.739896E-01	5.20255E+01	3.4492E+01	7.3150E+03	9.5798E+00	0.000E+00	1.419E+00
8.855500E-01	5.16809E+01	3.4156E+01	7.1492E+03	9.6517E+00	0.000E+00	1.400E+00
8.891100E-01	5.07262E+01	3.4053E+01	7.0991E+03	9.6736E+00	0.000E+00	1.394E+00
8.944500E-01	5.20499E+01	3.6056E+01	7.4718E+03	9.7060E+00	0.000E+00	1.386E+00
9.078000E-01	5.35344E+01	3.5683E+01	7.2856E+03	9.7857E+00	0.000E+00	1.366E+00
9.342948E-01	5.51792E+01	3.4963E+01	6.9363E+03	9.9376E+00	0.000E+00	1.327E+00
9.987612E-01	5.79642E+01	3.3342E+01	6.1878E+03	1.0275E+01	0.000E+00	1.241E+00
1.058400E+00	5.98671E+01	3.1785E+01	5.5664E+03	1.0549E+01	0.000E+00	1.171E+00
1.067676E+00	6.00719E+01	3.1553E+01	5.4778E+03	1.0589E+01	0.000E+00	1.161E+00
1.074600E+00	6.01619E+01	3.1382E+01	5.4129E+03	1.0618E+01	0.000E+00	1.154E+00
1.078920E+00	6.00566E+01	3.1271E+01	5.3721E+03	1.0636E+01	0.000E+00	1.149E+00
1.085400E+00	6.04900E+01	3.1556E+01	5.3888E+03	1.0663E+01	0.000E+00	1.142E+00
1.101600E+00	6.11428E+01	3.1128E+01	5.2375E+03	1.0728E+01	0.000E+00	1.125E+00
1.141345E+00	6.22892E+01	3.0123E+01	4.8920E+03	1.0877E+01	0.000E+00	1.086E+00
1.220098E+00	6.39498E+01	2.8075E+01	4.2651E+03	1.1138E+01	0.000E+00	1.016E+00
1.243620E+00	6.42609E+01	2.7421E+01	4.0869E+03	1.1207E+01	0.000E+00	9.970E-01
1.262655E+00	6.43257E+01	2.6915E+01	3.9510E+03	1.1260E+01	0.000E+00	9.819E-01
1.267731E+00	6.41241E+01	2.6784E+01	3.9160E+03	1.1274E+01	0.000E+00	9.780E-01
1.275345E+00	6.45230E+01	2.7131E+01	3.9432E+03	1.1295E+01	0.000E+00	9.722E-01
1.294380E+00	6.50202E+01	2.6660E+01	3.8177E+03	1.1344E+01	0.000E+00	9.579E-01
1.304285E+00	6.52023E+01	2.6422E+01	3.7549E+03	1.1369E+01	0.000E+00	9.506E-01
1.394281E+00	6.63393E+01	2.4462E+01	3.2519E+03	1.1568E+01	0.000E+00	8.892E-01
1.490486E+00	6.71081E+01	2.2675E+01	2.8198E+03	1.1734E+01	0.000E+00	8.318E-01
1.593329E+00	6.76393E+01	2.1018E+01	2.4450E+03	1.1866E+01	0.000E+00	7.781E-01
1.703269E+00	6.79719E+01	1.9501E+01	2.1221E+03	1.1963E+01	0.000E+00	7.279E-01
1.820795E+00	6.81368E+01	1.8124E+01	1.8450E+03	1.2024E+01	0.000E+00	6.809E-01
1.946430E+00	6.81498E+01	1.6875E+01	1.6069E+03	1.2049E+01	0.000E+00	6.370E-01
2.080733E+00	6.80232E+01	1.5741E+01	1.4023E+03	1.2040E+01	0.000E+00	5.959E-01
2.224304E+00	6.77424E+01	1.4707E+01	1.2256E+03	1.1995E+01	0.000E+00	5.574E-01
2.377781E+00	6.72542E+01	1.3760E+01	1.0726E+03	1.1916E+01	0.000E+00	5.214E-01
2.541848E+00	6.64879E+01	1.2897E+01	9.4044E+02	1.1803E+01	0.000E+00	4.878E-01
2.717235E+00	6.52404E+01	1.2012E+01	8.1940E+02	1.1659E+01	0.000E+00	4.563E-01
2.904724E+00	6.30106E+01	1.1152E+01	7.1165E+02	1.1484E+01	0.000E+00	4.268E-01
3.105150E+00	5.77265E+01	1.0209E+01	6.0938E+02	1.1281E+01	0.000E+00	3.993E-01
3.154620E+00	5.46701E+01	9.9646E+00	5.8548E+02	1.1229E+01	0.000E+00	3.930E-01
3.202905E+00	4.74992E+01	9.7367E+00	5.6347E+02	1.1178E+01	0.000E+00	3.871E-01
3.215781E+00	3.94338E+01	9.6776E+00	5.5780E+02	1.1164E+01	0.000E+00	3.855E-01
3.235095E+00	4.70761E+01	2.5070E+01	1.4364E+03	1.1143E+01	0.000E+00	3.832E-01
3.283380E+00	5.30804E+01	2.4428E+01	1.3790E+03	1.1091E+01	0.000E+00	3.776E-01
3.302796E+00	5.37617E+01	2.4177E+01	1.3568E+03	1.1069E+01	0.000E+00	3.754E-01
3.319406E+00	5.39096E+01	2.3966E+01	1.3382E+03	1.1051E+01	0.000E+00	3.735E-01
3.353349E+00	5.22118E+01	2.3544E+01	1.3014E+03	1.1014E+01	0.000E+00	3.697E-01
3.366830E+00	4.79088E+01	2.3380E+01	1.2871E+03	1.0999E+01	0.000E+00	3.683E-01
3.387051E+00	5.32837E+01	3.2580E+01	1.7829E+03	1.0977E+01	0.000E+00	3.661E-01
3.437604E+00	5.89151E+01	3.2042E+01	1.7277E+03	1.0921E+01	0.000E+00	3.607E-01
3.548445E+00	6.42353E+01	3.0912E+01	1.6147E+03	1.0797E+01	0.000E+00	3.494E-01
3.793288E+00	6.91124E+01	2.7898E+01	1.3632E+03	1.0521E+01	0.000E+00	3.269E-01
3.830820E+00	6.92257E+01	2.7450E+01	1.3282E+03	1.0478E+01	0.000E+00	3.236E-01
3.889455E+00	6.82021E+01	2.6763E+01	1.2754E+03	1.0412E+01	0.000E+00	3.188E-01
3.905091E+00	6.61496E+01	2.6582E+01	1.2617E+03	1.0394E+01	0.000E+00	3.175E-01
3.928545E+00	6.87070E+01	3.0771E+01	1.4518E+03	1.0368E+01	0.000E+00	3.156E-01
3.987180E+00	7.14470E+01	3.0074E+01	1.3981E+03	1.0301E+01	0.000E+00	3.110E-01

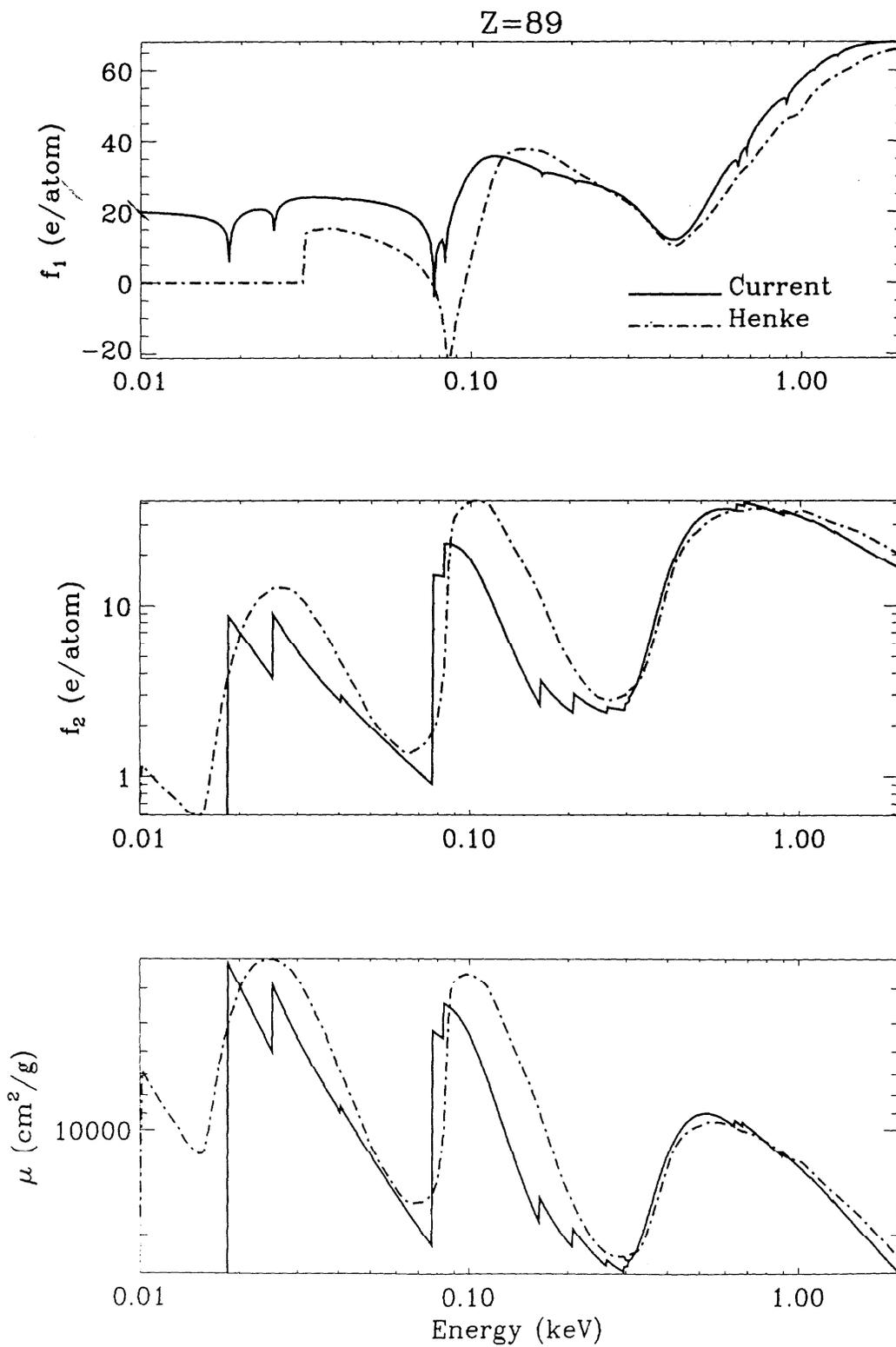
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 619

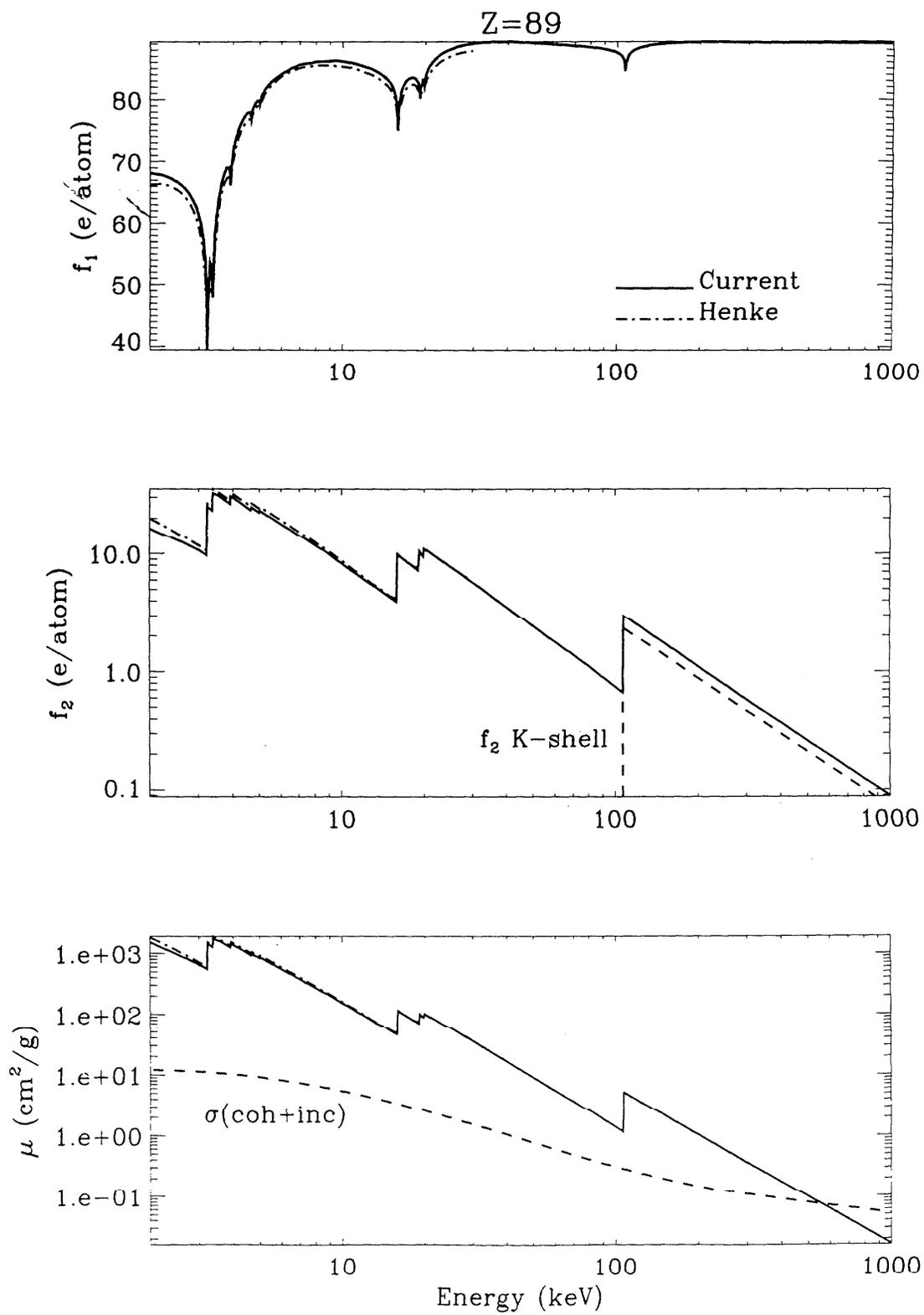
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
4.055024E+00	7.31027E+01	2.9293E+01	1.3390E+03	1.0225E+01	0.000E+00	3.058E-01
4.334821E+00	7.67671E+01	2.6301E+01	1.1246E+03	9.9112E+00	0.000E+00	2.860E-01
4.562880E+00	7.79642E+01	2.4201E+01	9.8309E+02	9.6600E+00	0.000E+00	2.717E-01
4.633924E+00	7.76849E+01	2.3607E+01	9.4424E+02	9.5828E+00	0.000E+00	2.676E-01
4.651344E+00	7.70244E+01	2.3465E+01	9.3505E+02	9.5639E+00	0.000E+00	2.666E-01
4.679280E+00	7.79254E+01	2.4762E+01	9.8086E+02	9.5337E+00	0.000E+00	2.650E-01
4.749120E+00	7.89170E+01	2.4206E+01	9.4474E+02	9.4586E+00	0.000E+00	2.611E-01
4.901960E+00	7.98369E+01	2.3066E+01	8.7218E+02	9.2962E+00	0.000E+00	2.529E-01
4.953664E+00	7.99200E+01	2.2704E+01	8.4952E+02	9.2419E+00	0.000E+00	2.503E-01
4.976990E+00	7.98445E+01	2.2544E+01	8.3957E+02	9.2175E+00	0.000E+00	2.491E-01
4.996998E+00	7.94488E+01	2.2408E+01	8.3118E+02	9.1966E+00	0.000E+00	2.481E-01
5.027010E+00	8.01012E+01	2.3191E+01	8.5508E+02	9.1653E+00	0.000E+00	2.466E-01
5.102040E+00	8.08956E+01	2.2702E+01	8.2473E+02	9.0877E+00	0.000E+00	2.430E-01
5.295467E+00	8.20035E+01	2.1513E+01	7.5301E+02	8.8909E+00	0.000E+00	2.341E-01
5.660855E+00	8.32952E+01	1.9546E+01	6.3999E+02	8.5323E+00	0.000E+00	2.190E-01
6.051453E+00	8.41867E+01	1.7771E+01	5.4432E+02	8.1684E+00	0.000E+00	2.049E-01
6.469004E+00	8.49840E+01	1.6148E+01	4.6269E+02	7.8014E+00	0.000E+00	1.917E-01
6.915365E+00	8.55362E+01	1.4624E+01	3.9197E+02	7.4334E+00	0.000E+00	1.793E-01
7.392525E+00	8.58036E+01	1.3242E+01	3.3203E+02	7.0664E+00	0.000E+00	1.677E-01
7.902609E+00	8.60482E+01	1.2009E+01	2.8166E+02	6.7023E+00	0.000E+00	1.569E-01
8.447890E+00	8.61232E+01	1.0891E+01	2.3896E+02	6.3428E+00	0.000E+00	1.468E-01
9.030794E+00	8.62298E+01	9.8603E+00	2.0238E+02	5.9894E+00	0.000E+00	1.373E-01
9.653919E+00	8.61994E+01	8.8228E+00	1.6939E+02	5.6435E+00	0.000E+00	1.284E-01
1.032004E+01	8.60250E+01	7.8971E+00	1.4184E+02	5.3064E+00	0.000E+00	1.201E-01
1.103212E+01	8.57468E+01	7.0763E+00	1.1889E+02	4.9792E+00	0.000E+00	1.124E-01
1.179334E+01	8.53853E+01	6.3510E+00	9.9818E+01	4.6627E+00	0.000E+00	1.051E-01
1.260708E+01	8.49223E+01	5.7054E+00	8.3883E+01	4.3576E+00	0.000E+00	9.834E-02
1.347697E+01	8.43009E+01	5.1303E+00	7.0559E+01	4.0648E+00	0.000E+00	9.200E-02
1.440688E+01	8.33587E+01	4.6144E+00	5.9367E+01	3.7844E+00	0.000E+00	8.606E-02
1.540095E+01	8.12584E+01	4.1462E+00	4.9901E+01	3.5170E+00	0.000E+00	8.050E-02
1.555358E+01	8.05389E+01	4.0817E+00	4.8642E+01	3.4786E+00	0.000E+00	7.971E-02
1.579165E+01	7.79818E+01	3.9846E+00	4.6769E+01	3.4200E+00	0.000E+00	7.851E-02
1.585513E+01	7.49735E+01	3.9594E+00	4.6287E+01	3.4047E+00	0.000E+00	7.820E-02
1.595036E+01	7.79733E+01	9.8111E+00	1.1401E+02	3.3818E+00	0.000E+00	7.773E-02
1.618842E+01	8.06378E+01	9.5811E+00	1.0970E+02	3.3258E+00	0.000E+00	7.659E-02
1.646362E+01	8.18116E+01	9.3265E+00	1.0500E+02	3.2628E+00	0.000E+00	7.531E-02
1.759961E+01	8.34273E+01	8.3371E+00	8.7803E+01	3.0217E+00	0.000E+00	7.045E-02
1.870154E+01	8.29309E+01	7.5063E+00	7.4396E+01	2.8138E+00	0.000E+00	6.630E-02
1.881398E+01	8.26417E+01	7.4287E+00	7.3187E+01	2.7939E+00	0.000E+00	6.590E-02
1.898778E+01	8.17056E+01	7.3111E+00	7.1369E+01	2.7635E+00	0.000E+00	6.530E-02
1.906412E+01	8.01855E+01	7.2604E+00	7.0590E+01	2.7503E+00	0.000E+00	6.504E-02
1.917862E+01	8.17070E+01	1.0179E+01	9.8374E+01	2.7307E+00	0.000E+00	6.465E-02
1.944320E+01	8.29316E+01	9.9560E+00	9.4911E+01	2.6863E+00	0.000E+00	6.377E-02
1.946486E+01	8.29754E+01	9.9381E+00	9.4635E+01	2.6828E+00	0.000E+00	6.370E-02
1.974080E+01	8.30354E+01	9.7148E+00	9.1215E+01	2.6378E+00	0.000E+00	6.281E-02
1.982016E+01	8.24220E+01	9.6521E+00	9.0264E+01	2.6251E+00	0.000E+00	6.255E-02
1.993920E+01	8.33853E+01	1.1060E+01	1.0281E+02	2.6062E+00	0.000E+00	6.218E-02
2.011215E+01	8.41382E+01	1.0919E+01	1.0063E+02	2.5791E+00	0.000E+00	6.165E-02
2.023680E+01	8.44903E+01	1.0818E+01	9.9087E+01	2.5599E+00	0.000E+00	6.127E-02
2.149988E+01	8.63479E+01	9.8611E+00	8.5014E+01	2.3773E+00	0.000E+00	5.767E-02
2.298338E+01	8.74007E+01	8.8862E+00	7.1664E+01	2.1881E+00	0.000E+00	5.395E-02
2.456923E+01	8.80633E+01	8.0074E+00	6.0409E+01	2.0112E+00	0.000E+00	5.046E-02
2.626450E+01	8.85179E+01	7.2189E+00	5.0945E+01	1.8463E+00	0.000E+00	4.721E-02
2.807676E+01	8.88544E+01	6.4683E+00	4.2701E+01	1.6929E+00	0.000E+00	4.416E-02
3.001405E+01	8.90513E+01	5.7880E+00	3.5744E+01	1.5505E+00	0.000E+00	4.131E-02
3.208502E+01	8.92282E+01	5.1815E+00	2.9933E+01	1.4187E+00	0.000E+00	3.864E-02
3.429889E+01	8.92867E+01	4.6315E+00	2.5029E+01	1.2970E+00	0.000E+00	3.615E-02
3.666551E+01	8.93029E+01	4.1441E+00	2.0950E+01	1.1848E+00	0.000E+00	3.381E-02
3.919543E+01	8.93280E+01	3.7081E+00	1.7535E+01	1.0817E+00	0.000E+00	3.163E-02
4.189992E+01	8.93195E+01	3.3067E+00	1.4628E+01	9.8698E-01	0.000E+00	2.959E-02
4.479101E+01	8.92620E+01	2.9491E+00	1.2204E+01	9.0026E-01	0.000E+00	2.768E-02
4.788159E+01	8.91902E+01	2.6322E+00	1.0189E+01	8.2099E-01	0.000E+00	2.589E-02
5.118542E+01	8.91089E+01	2.3512E+00	8.5140E+00	7.4865E-01	0.000E+00	2.422E-02
5.471721E+01	8.90209E+01	2.1017E+00	7.1195E+00	6.8276E-01	0.000E+00	2.266E-02
5.849270E+01	8.89277E+01	1.8802E+00	5.9579E+00	6.2285E-01	0.000E+00	2.120E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
6.252870E+01	8.88300E+01	1.6832E+00	4.9895E+00	5.6845E-01	0.000E+00	1.983E-02
6.684318E+01	8.87272E+01	1.5080E+00	4.1817E+00	5.1914E-01	0.000E+00	1.855E-02
7.145536E+01	8.86177E+01	1.3506E+00	3.5033E+00	4.7450E-01	0.000E+00	1.735E-02
7.638578E+01	8.84967E+01	1.2095E+00	2.9349E+00	4.3414E-01	0.000E+00	1.623E-02
8.165640E+01	8.83607E+01	1.0812E+00	2.4542E+00	3.9770E-01	0.000E+00	1.518E-02
8.729069E+01	8.81880E+01	9.5963E-01	2.0377E+00	3.6482E-01	0.000E+00	1.420E-02
9.331374E+01	8.79430E+01	8.5031E-01	1.6890E+00	3.3518E-01	0.000E+00	1.329E-02
9.975239E+01	8.75154E+01	7.5400E-01	1.4010E+00	3.0849E-01	0.000E+00	1.243E-02
1.046202E+02	8.67083E+01	6.9228E-01	1.2265E+00	2.9107E-01	0.000E+00	1.185E-02
1.062215E+02	8.57166E+01	6.7374E-01	1.1756E+00	2.8579E-01	0.000E+00	1.167E-02
1.066353E+02	8.46176E+01	6.6908E-01	1.1630E+00	2.8446E-01	0.000E+00	1.163E-02
1.066485E+02	8.45308E+01	6.6893E-01	1.1626E+00	2.8442E-01	0.000E+00	1.163E-02
1.072891E+02	8.57662E+01	2.9949E+00	5.1740E+00	2.8238E-01	4.031E+00	1.156E-02
1.088904E+02	8.68460E+01	2.9272E+00	4.9827E+00	2.7743E-01	3.885E+00	1.139E-02
1.139931E+02	8.78237E+01	2.7264E+00	4.4331E+00	2.6284E-01	3.467E+00	1.088E-02
1.218587E+02	8.83964E+01	2.4567E+00	3.7368E+00	2.4338E-01	2.934E+00	1.017E-02
1.302669E+02	8.87071E+01	2.2109E+00	3.1459E+00	2.2588E-01	2.478E+00	9.518E-03
1.392553E+02	8.89025E+01	1.9891E+00	2.6476E+00	2.1013E-01	2.092E+00	8.903E-03
1.488640E+02	8.90330E+01	1.7894E+00	2.2280E+00	1.9594E-01	1.765E+00	8.329E-03
1.591356E+02	8.91220E+01	1.6081E+00	1.8730E+00	1.8316E-01	1.487E+00	7.791E-03
1.701159E+02	8.91812E+01	1.4447E+00	1.5741E+00	1.7162E-01	1.252E+00	7.288E-03
1.818539E+02	8.92198E+01	1.2979E+00	1.3229E+00	1.6120E-01	1.054E+00	6.818E-03
1.944018E+02	8.92436E+01	1.1661E+00	1.1118E+00	1.5177E-01	8.875E-01	6.378E-03
2.078156E+02	8.92565E+01	1.0478E+00	9.3459E-01	1.4322E-01	7.471E-01	5.966E-03
2.221548E+02	8.92614E+01	9.4169E-01	7.8569E-01	1.3544E-01	6.289E-01	5.581E-03
2.374835E+02	8.92607E+01	8.4700E-01	6.6107E-01	1.2836E-01	5.299E-01	5.221E-03
2.538699E+02	8.92560E+01	7.6192E-01	5.5629E-01	1.2188E-01	4.465E-01	4.884E-03
2.713869E+02	8.92485E+01	6.8547E-01	4.6817E-01	1.1594E-01	3.762E-01	4.569E-03
2.901126E+02	8.92389E+01	6.1676E-01	3.9405E-01	1.1048E-01	3.170E-01	4.274E-03
3.101304E+02	8.92280E+01	5.5500E-01	3.3170E-01	1.0543E-01	2.671E-01	3.998E-03
3.315294E+02	8.92162E+01	4.9947E-01	2.7925E-01	1.0075E-01	2.251E-01	3.740E-03
3.544049E+02	8.92040E+01	4.4955E-01	2.3511E-01	9.6404E-02	1.896E-01	3.498E-03
3.788588E+02	8.91916E+01	4.0465E-01	1.9797E-01	9.2341E-02	1.598E-01	3.273E-03
4.050001E+02	8.91792E+01	3.6428E-01	1.6672E-01	8.8531E-02	1.346E-01	3.061E-03
4.329451E+02	8.91671E+01	3.2796E-01	1.4041E-01	8.4946E-02	1.134E-01	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 623

Th Z = 90

Atomic weight = 2.320381E+02 g/mol, nominal density ρ (g/cm³) = 1.1700E+01

μ_a (barns/atom) = μ (cm²/g) \times 3.85309E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.81351E+05

24 edges. Edge energies (keV):

K		1.09651E+02	L	I	2.04721E+00	L	II	1.96932E+00	L	III	1.63003E+01
M	I	5.18230E+02	M	II	4.83040E+00	M	III	4.04610E+00	M	IV	3.49080E+00
M	V	3.33200E+00	N	I	1.32950E+00	N	II	1.16820E+00	N	III	9.67300E-01
N	IV	7.14100E-00	N	V	6.76400E-00	N	VI	3.44400E-00	N	VII	3.35200E-01
O	I	2.90200E-00	O	II	2.29400E-00	O	III	1.81800E-00	O	IV	9.43000E-02
O	V	8.79000E-02	P	I	5.95000E-02	P	II	4.90000E-02	P	III	4.30000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.4308E+00, -1.4118E+00 e/atom

Nuclear Thomson correction f_{NT} = -1.9150E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	$\mu\kappa$ cm ² /g	λ nm
1.069000E-02	2.61909E+01	0.0000E+00	0.0000E+00	1.1681E-04	0.000E+00	1.160E+02
1.142761E-02	2.61747E+01	0.0000E+00	0.0000E+00	1.6149E-04	0.000E+00	1.085E+02
1.221612E-02	2.61560E+01	0.0000E+00	0.0000E+00	2.2208E-04	0.000E+00	1.015E+02
1.305903E-02	2.61344E+01	0.0000E+00	0.0000E+00	3.0377E-04	0.000E+00	9.494E+01
1.396010E-02	2.61094E+01	0.0000E+00	0.0000E+00	4.1332E-04	0.000E+00	8.881E+01
1.492335E-02	2.60805E+01	0.0000E+00	0.0000E+00	5.5943E-04	0.000E+00	8.308E+01
1.595306E-02	2.60468E+01	0.0000E+00	0.0000E+00	7.5323E-04	0.000E+00	7.772E+01
1.705382E-02	2.60075E+01	0.0000E+00	0.0000E+00	1.0089E-03	0.000E+00	7.270E+01
1.823053E-02	2.59615E+01	0.0000E+00	0.0000E+00	1.3444E-03	0.000E+00	6.801E+01
1.948844E-02	2.59075E+01	0.0000E+00	0.0000E+00	1.7823E-03	0.000E+00	6.362E+01
2.083314E-02	2.58437E+01	0.0000E+00	0.0000E+00	2.3507E-03	0.000E+00	5.951E+01
2.227063E-02	2.57680E+01	0.0000E+00	0.0000E+00	3.0847E-03	0.000E+00	5.567E+01
2.380730E-02	2.56773E+01	0.0000E+00	0.0000E+00	4.0275E-03	0.000E+00	5.208E+01
2.545001E-02	2.55675E+01	0.0000E+00	0.0000E+00	5.2322E-03	0.000E+00	4.872E+01
2.720606E-02	2.54331E+01	0.0000E+00	0.0000E+00	6.7634E-03	0.000E+00	4.557E+01
2.908327E-02	2.52654E+01	0.0000E+00	0.0000E+00	8.6995E-03	0.000E+00	4.263E+01
3.109002E-02	2.50513E+01	0.0000E+00	0.0000E+00	1.1135E-02	0.000E+00	3.988E+01
3.323523E-02	2.47680E+01	0.0000E+00	0.0000E+00	1.4182E-02	0.000E+00	3.731E+01
3.552846E-02	2.43716E+01	0.0000E+00	0.0000E+00	1.7977E-02	0.000E+00	3.490E+01
3.797993E-02	2.37586E+01	0.0000E+00	0.0000E+00	2.2676E-02	0.000E+00	3.264E+01
4.060054E-02	2.25604E+01	0.0000E+00	0.0000E+00	2.8467E-02	0.000E+00	3.054E+01
4.214000E-02	2.07833E+01	0.0000E+00	0.0000E+00	3.2250E-02	0.000E+00	2.942E+01
4.278500E-02	1.82078E+01	0.0000E+00	0.0000E+00	3.3920E-02	0.000E+00	2.898E+01
4.295700E-02	1.50579E+01	0.0000E+00	0.0000E+00	3.4375E-02	0.000E+00	2.886E+01
4.321500E-02	1.84936E+01	6.2225E+00	2.6113E+04	3.5063E-02	0.000E+00	2.869E+01
4.340198E-02	1.98275E+01	6.1089E+00	2.5526E+04	3.5566E-02	0.000E+00	2.857E+01
4.386000E-02	2.14550E+01	5.8413E+00	2.4152E+04	3.6818E-02	0.000E+00	2.827E+01
4.639671E-02	2.38408E+01	4.5952E+00	1.7961E+04	4.4227E-02	0.000E+00	2.672E+01
4.802000E-02	2.35458E+01	3.9690E+00	1.4989E+04	4.9393E-02	0.000E+00	2.582E+01
4.875500E-02	2.22214E+01	3.7229E+00	1.3848E+04	5.1842E-02	0.000E+00	2.543E+01
4.895100E-02	2.03983E+01	3.6609E+00	1.3563E+04	5.2507E-02	0.000E+00	2.533E+01
4.924500E-02	2.24783E+01	7.2684E+00	2.6767E+04	5.3514E-02	0.000E+00	2.518E+01
4.959809E-02	2.36759E+01	7.0823E+00	2.5896E+04	5.4737E-02	0.000E+00	2.500E+01
4.998000E-02	2.43778E+01	6.8885E+00	2.4995E+04	5.6079E-02	0.000E+00	2.481E+01
5.302035E-02	2.64301E+01	5.5810E+00	1.9089E+04	6.7430E-02	0.000E+00	2.338E+01
5.667876E-02	2.70453E+01	4.4349E+00	1.4190E+04	8.2682E-02	0.000E+00	2.187E+01
5.831000E-02	2.70765E+01	4.0354E+00	1.2551E+04	9.0045E-02	0.000E+00	2.126E+01
5.920250E-02	2.69974E+01	3.8396E+00	1.1762E+04	9.4220E-02	0.000E+00	2.094E+01
5.944050E-02	2.68837E+01	3.7899E+00	1.1563E+04	9.5351E-02	0.000E+00	2.086E+01
5.979750E-02	2.70060E+01	3.9429E+00	1.1958E+04	9.7062E-02	0.000E+00	2.073E+01
6.058959E-02	2.70943E+01	3.7785E+00	1.1310E+04	1.0092E-01	0.000E+00	2.046E+01
6.069000E-02	2.70987E+01	3.7584E+00	1.1231E+04	1.0141E-01	0.000E+00	2.043E+01
6.477028E-02	2.69725E+01	3.0621E+00	8.5735E+03	1.2261E-01	0.000E+00	1.914E+01
6.923942E-02	2.64968E+01	2.5065E+00	6.5649E+03	1.4829E-01	0.000E+00	1.791E+01
7.401695E-02	2.56863E+01	2.0745E+00	5.0829E+03	1.7854E-01	0.000E+00	1.675E+01
7.912411E-02	2.43204E+01	1.7349E+00	3.9764E+03	2.1399E-01	0.000E+00	1.567E+01
8.458368E-02	2.13271E+01	1.4655E+00	3.1421E+03	2.5535E-01	0.000E+00	1.466E+01
8.614200E-02	1.93923E+01	1.4018E+00	2.9510E+03	2.6779E-01	0.000E+00	1.439E+01
8.746050E-02	1.52600E+01	1.3516E+00	2.8026E+03	2.7854E-01	0.000E+00	1.418E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
8.781210E-02	1.05314E+01	1.3388E+00	2.7648E+03	2.8143E-01	0.000E+00	1.412E+01
8.833950E-02	1.52455E+01	1.0479E+01	2.1513E+04	2.8581E-01	0.000E+00	1.403E+01
8.965800E-02	1.91082E+01	1.0267E+01	2.0767E+04	2.9687E-01	0.000E+00	1.383E+01
9.041995E-02	1.99602E+01	1.0148E+01	2.0353E+04	3.0336E-01	0.000E+00	1.371E+01
9.241400E-02	2.06364E+01	9.8487E+00	1.9327E+04	3.2063E-01	0.000E+00	1.342E+01
9.382850E-02	1.90670E+01	9.6467E+00	1.8645E+04	3.3314E-01	0.000E+00	1.321E+01
9.420570E-02	1.63088E+01	9.5941E+00	1.8469E+04	3.3651E-01	0.000E+00	1.316E+01
9.477150E-02	1.96559E+01	1.5359E+01	2.9390E+04	3.4160E-01	0.000E+00	1.308E+01
9.618600E-02	2.30007E+01	1.5131E+01	2.8528E+04	3.5446E-01	0.000E+00	1.289E+01
9.665893E-02	2.36508E+01	1.5057E+01	2.8249E+04	3.5881E-01	0.000E+00	1.283E+01
1.033284E-01	2.87800E+01	1.3806E+01	2.4230E+04	4.2255E-01	0.000E+00	1.200E+01
1.104581E-01	3.17444E+01	1.2059E+01	1.9799E+04	4.9546E-01	0.000E+00	1.122E+01
1.180797E-01	3.34529E+01	9.9814E+00	1.5330E+04	5.7846E-01	0.000E+00	1.050E+01
1.262272E-01	3.41995E+01	7.9913E+00	1.1481E+04	6.7248E-01	0.000E+00	9.822E+00
1.349368E-01	3.42958E+01	6.2997E+00	8.4665E+03	7.7848E-01	0.000E+00	9.188E+00
1.442475E-01	3.39918E+01	4.9610E+00	6.2371E+03	8.9740E-01	0.000E+00	8.595E+00
1.542005E-01	3.34567E+01	3.9461E+00	4.6409E+03	1.0302E+00	0.000E+00	8.040E+00
1.648404E-01	3.27642E+01	3.1953E+00	3.5154E+03	1.1777E+00	0.000E+00	7.521E+00
1.762144E-01	3.18283E+01	2.6470E+00	2.7241E+03	1.3408E+00	0.000E+00	7.036E+00
1.781640E-01	3.15922E+01	2.5722E+00	2.6182E+03	1.3693E+00	0.000E+00	6.959E+00
1.808910E-01	3.10082E+01	2.4753E+00	2.4816E+03	1.4093E+00	0.000E+00	6.854E+00
1.816182E-01	3.04467E+01	2.4508E+00	2.4472E+03	1.4200E+00	0.000E+00	6.827E+00
1.827090E-01	3.09264E+01	3.4426E+00	3.4170E+03	1.4361E+00	0.000E+00	6.786E+00
1.854360E-01	3.12521E+01	3.3473E+00	3.2735E+03	1.4766E+00	0.000E+00	6.686E+00
1.883732E-01	3.13039E+01	3.2527E+00	3.1314E+03	1.5203E+00	0.000E+00	6.582E+00
2.013709E-01	3.10131E+01	2.9151E+00	2.6253E+03	1.7169E+00	0.000E+00	6.157E+00
2.152655E-01	3.04439E+01	2.6679E+00	2.2476E+03	1.9311E+00	0.000E+00	5.760E+00
2.248120E-01	2.98917E+01	2.5468E+00	2.0545E+03	2.0801E+00	0.000E+00	5.515E+00
2.282530E-01	2.94946E+01	2.5105E+00	1.9947E+03	2.1341E+00	0.000E+00	5.432E+00
2.291706E-01	2.91368E+01	2.5014E+00	1.9795E+03	2.1485E+00	0.000E+00	5.410E+00
2.301188E-01	2.93458E+01	3.1319E+00	2.4682E+03	2.1634E+00	0.000E+00	5.388E+00
2.305470E-01	2.94284E+01	3.1242E+00	2.4576E+03	2.1701E+00	0.000E+00	5.378E+00
2.339880E-01	2.95932E+01	3.0655E+00	2.3759E+03	2.2243E+00	0.000E+00	5.299E+00
2.459970E-01	2.93664E+01	2.8929E+00	2.1327E+03	2.4140E+00	0.000E+00	5.040E+00
2.629708E-01	2.86973E+01	2.7185E+00	1.8747E+03	2.6831E+00	0.000E+00	4.715E+00
2.811158E-01	2.77574E+01	2.6016E+00	1.6783E+03	2.9707E+00	0.000E+00	4.410E+00
2.843960E-01	2.75493E+01	2.5861E+00	1.6491E+03	3.0225E+00	0.000E+00	4.360E+00
2.887490E-01	2.72131E+01	2.5676E+00	1.6126E+03	3.0912E+00	0.000E+00	4.294E+00
2.899098E-01	2.70395E+01	2.5631E+00	1.6033E+03	3.1095E+00	0.000E+00	4.277E+00
2.916510E-01	2.70428E+01	2.7642E+00	1.7188E+03	3.1370E+00	0.000E+00	4.251E+00
2.960040E-01	2.68697E+01	2.7511E+00	1.6855E+03	3.2055E+00	0.000E+00	4.189E+00
3.005128E-01	2.66201E+01	2.7396E+00	1.6533E+03	3.2763E+00	0.000E+00	4.126E+00
3.212482E-01	2.51289E+01	2.7077E+00	1.5285E+03	3.5996E+00	0.000E+00	3.859E+00
3.284960E-01	2.44414E+01	2.7030E+00	1.4922E+03	3.7115E+00	0.000E+00	3.774E+00
3.335240E-01	2.38213E+01	2.7013E+00	1.4688E+03	3.7887E+00	0.000E+00	3.717E+00
3.348648E-01	2.35307E+01	2.7010E+00	1.4628E+03	3.8093E+00	0.000E+00	3.703E+00
3.368760E-01	2.34319E+01	2.9966E+00	1.6132E+03	3.8400E+00	0.000E+00	3.680E+00
3.375120E-01	2.33851E+01	3.0053E+00	1.6148E+03	3.8497E+00	0.000E+00	3.673E+00
3.419040E-01	2.29230E+01	3.0731E+00	1.6300E+03	3.9167E+00	0.000E+00	3.626E+00
3.426780E-01	2.28178E+01	3.0865E+00	1.6334E+03	3.9285E+00	0.000E+00	3.618E+00
3.434143E-01	2.27010E+01	3.0997E+00	1.6369E+03	3.9397E+00	0.000E+00	3.610E+00
3.440556E-01	2.25576E+01	3.1115E+00	1.6401E+03	3.9494E+00	0.000E+00	3.604E+00
3.461220E-01	2.24336E+01	3.3865E+00	1.7743E+03	3.9808E+00	0.000E+00	3.582E+00
3.512880E-01	2.19364E+01	3.5645E+00	1.8402E+03	4.0589E+00	0.000E+00	3.529E+00
3.671099E-01	2.00231E+01	4.4154E+00	2.1812E+03	4.2958E+00	0.000E+00	3.377E+00
3.924405E-01	1.67831E+01	7.1039E+00	3.2828E+03	4.6665E+00	0.000E+00	3.159E+00
4.195189E-01	1.41508E+01	1.1622E+01	5.0240E+03	5.0505E+00	0.000E+00	2.955E+00
4.484657E-01	1.31384E+01	1.7550E+01	7.0969E+03	5.4460E+00	0.000E+00	2.765E+00
4.794098E-01	1.43156E+01	2.3895E+01	9.0389E+03	5.8511E+00	0.000E+00	2.586E+00
5.124891E-01	1.75452E+01	2.9557E+01	1.0459E+04	6.2636E+00	0.000E+00	2.419E+00
5.478508E-01	2.21551E+01	3.3777E+01	1.1181E+04	6.6812E+00	0.000E+00	2.263E+00
5.856525E-01	2.72567E+01	3.6283E+01	1.1235E+04	7.1014E+00	0.000E+00	2.117E+00
6.260625E-01	3.19663E+01	3.7198E+01	1.0775E+04	7.5215E+00	0.000E+00	1.980E+00
6.628720E-01	3.45665E+01	3.6966E+01	1.0113E+04	7.8790E+00	0.000E+00	1.870E+00
6.692609E-01	3.44716E+01	3.6854E+01	9.9864E+03	7.9387E+00	0.000E+00	1.853E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z= 1-92 625

TABLE 1: Form factors, attenuation and scattering cross-sections, Z= 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
6.730180E-01	3.40022E+01	3.6780E+01	9.9107E+03	7.9734E+00	0.000E+00	1.842E+00
6.757236E-01	3.25186E+01	3.6723E+01	9.8558E+03	7.9983E+00	0.000E+00	1.835E+00
6.797820E-01	3.45273E+01	3.9972E+01	1.0664E+04	8.0354E+00	0.000E+00	1.824E+00
6.899280E-01	3.67196E+01	3.9785E+01	1.0458E+04	8.1271E+00	0.000E+00	1.797E+00
6.998180E-01	3.78532E+01	3.9573E+01	1.0255E+04	8.2147E+00	0.000E+00	1.772E+00
7.105295E-01	3.82815E+01	3.9315E+01	1.0035E+04	8.3079E+00	0.000E+00	1.745E+00
7.133859E-01	3.75786E+01	3.9242E+01	9.9758E+03	8.3325E+00	0.000E+00	1.738E+00
7.154399E-01	3.81919E+01	4.1177E+01	1.0438E+04	8.3500E+00	0.000E+00	1.733E+00
7.176705E-01	3.90442E+01	4.1128E+01	1.0393E+04	8.3690E+00	0.000E+00	1.728E+00
7.283820E-01	4.09945E+01	4.0878E+01	1.0178E+04	8.4592E+00	0.000E+00	1.702E+00
7.648052E-01	4.49421E+01	3.9918E+01	9.4653E+03	8.7526E+00	0.000E+00	1.621E+00
8.175768E-01	4.89586E+01	3.8340E+01	8.5044E+03	9.1436E+00	0.000E+00	1.516E+00
8.739896E-01	5.20627E+01	3.6575E+01	7.5893E+03	9.5198E+00	0.000E+00	1.419E+00
9.342948E-01	5.41871E+01	3.4753E+01	6.7458E+03	9.8786E+00	0.000E+00	1.327E+00
9.479540E-01	5.43718E+01	3.4360E+01	6.5733E+03	9.9541E+00	0.000E+00	1.308E+00
9.624635E-01	5.39628E+01	3.3951E+01	6.3973E+03	1.0032E+01	0.000E+00	1.288E+00
9.663327E-01	5.29747E+01	3.3844E+01	6.3515E+03	1.0052E+01	0.000E+00	1.283E+00
9.721365E-01	5.43283E+01	3.5901E+01	6.6973E+03	1.0083E+01	0.000E+00	1.275E+00
9.866460E-01	5.55372E+01	3.5510E+01	6.5270E+03	1.0157E+01	0.000E+00	1.257E+00
9.987612E-01	5.66113E+01	3.5192E+01	6.3901E+03	1.0217E+01	0.000E+00	1.241E+00
1.067676E+00	5.96223E+01	3.3269E+01	5.6509E+03	1.0533E+01	0.000E+00	1.161E+00
1.141345E+00	6.17056E+01	3.1392E+01	4.9880E+03	1.0823E+01	0.000E+00	1.086E+00
1.144836E+00	6.17815E+01	3.1305E+01	4.9589E+03	1.0835E+01	0.000E+00	1.083E+00
1.162359E+00	6.20428E+01	3.0854E+01	4.8138E+03	1.0897E+01	0.000E+00	1.067E+00
1.167032E+00	6.19319E+01	3.0736E+01	4.7762E+03	1.0914E+01	0.000E+00	1.062E+00
1.174041E+00	6.23361E+01	3.1003E+01	4.7890E+03	1.0937E+01	0.000E+00	1.056E+00
1.191564E+00	6.29405E+01	3.0570E+01	4.6527E+03	1.0996E+01	0.000E+00	1.041E+00
1.220098E+00	6.36643E+01	2.9870E+01	4.4398E+03	1.1085E+01	0.000E+00	1.016E+00
1.302910E+00	6.51130E+01	2.7954E+01	3.8908E+03	1.1315E+01	0.000E+00	9.516E-01
1.304285E+00	6.51281E+01	2.7924E+01	3.8826E+03	1.1318E+01	0.000E+00	9.506E-01
1.322852E+00	6.52187E+01	2.7527E+01	3.7737E+03	1.1364E+01	0.000E+00	9.372E-01
1.328170E+00	6.50333E+01	2.7416E+01	3.7434E+03	1.1376E+01	0.000E+00	9.335E-01
1.336147E+00	6.54457E+01	2.7784E+01	3.7710E+03	1.1395E+01	0.000E+00	9.279E-01
1.356090E+00	6.59912E+01	2.7340E+01	3.6562E+03	1.1440E+01	0.000E+00	9.143E-01
1.394281E+00	6.66735E+01	2.6477E+01	3.4438E+03	1.1520E+01	0.000E+00	8.892E-01
1.490486E+00	6.78083E+01	2.4451E+01	2.9750E+03	1.1688E+01	0.000E+00	8.318E-01
1.593329E+00	6.85722E+01	2.2623E+01	2.5750E+03	1.1823E+01	0.000E+00	7.781E-01
1.703269E+00	6.90935E+01	2.0944E+01	2.2300E+03	1.1923E+01	0.000E+00	7.279E-01
1.820795E+00	6.94038E+01	1.9396E+01	1.9318E+03	1.1987E+01	0.000E+00	6.809E-01
1.946430E+00	6.95328E+01	1.7987E+01	1.6759E+03	1.2015E+01	0.000E+00	6.370E-01
2.080733E+00	6.95040E+01	1.6713E+01	1.4566E+03	1.2009E+01	0.000E+00	5.959E-01
2.224304E+00	6.93177E+01	1.5559E+01	1.2685E+03	1.1967E+01	0.000E+00	5.574E-01
2.377781E+00	6.89539E+01	1.4510E+01	1.1067E+03	1.1890E+01	0.000E+00	5.214E-01
2.541848E+00	6.83469E+01	1.3550E+01	9.6676E+02	1.1781E+01	0.000E+00	4.878E-01
2.717235E+00	6.73970E+01	1.2670E+01	8.4564E+02	1.1640E+01	0.000E+00	4.563E-01
2.904724E+00	6.58273E+01	1.1779E+01	7.3537E+02	1.1468E+01	0.000E+00	4.268E-01
3.105150E+00	6.27555E+01	1.0766E+01	6.2875E+02	1.1267E+01	0.000E+00	3.993E-01
3.265360E+00	5.64413E+01	9.9671E+00	5.5355E+02	1.1098E+01	0.000E+00	3.797E-01
3.315340E+00	4.98314E+01	9.7405E+00	5.3281E+02	1.1044E+01	0.000E+00	3.740E-01
3.319406E+00	4.85588E+01	9.7225E+00	5.3117E+02	1.1040E+01	0.000E+00	3.735E-01
3.328668E+00	4.26554E+01	9.6817E+00	5.2747E+02	1.1030E+01	0.000E+00	3.725E-01
3.348660E+00	4.89995E+01	2.3222E+01	1.2576E+03	1.1008E+01	0.000E+00	3.703E-01
3.398640E+00	5.38257E+01	2.3169E+01	1.2363E+03	1.0954E+01	0.000E+00	3.648E-01
3.420984E+00	5.43109E+01	2.3148E+01	1.2271E+03	1.0929E+01	0.000E+00	3.624E-01
3.473346E+00	5.21394E+01	2.3103E+01	1.2063E+03	1.0871E+01	0.000E+00	3.570E-01
3.487309E+00	4.72186E+01	2.3093E+01	1.2009E+03	1.0856E+01	0.000E+00	3.555E-01
3.508254E+00	5.36217E+01	3.3748E+01	1.7445E+03	1.0833E+01	0.000E+00	3.534E-01
3.548445E+00	5.91957E+01	3.3101E+01	1.6917E+03	1.0788E+01	0.000E+00	3.494E-01
3.560616E+00	6.02205E+01	3.2903E+01	1.6758E+03	1.0775E+01	0.000E+00	3.482E-01
3.793288E+00	6.89910E+01	2.9417E+01	1.4064E+03	1.0514E+01	0.000E+00	3.269E-01
3.965178E+00	7.07696E+01	2.7185E+01	1.2433E+03	1.0321E+01	0.000E+00	3.127E-01
4.025870E+00	6.96889E+01	2.6448E+01	1.1914E+03	1.0253E+01	0.000E+00	3.080E-01
4.042054E+00	6.76045E+01	2.6257E+01	1.1780E+03	1.0235E+01	0.000E+00	3.067E-01
4.055024E+00	6.88475E+01	3.0612E+01	1.3691E+03	1.0220E+01	0.000E+00	3.058E-01
4.066331E+00	7.01740E+01	3.0470E+01	1.3589E+03	1.0207E+01	0.000E+00	3.049E-01

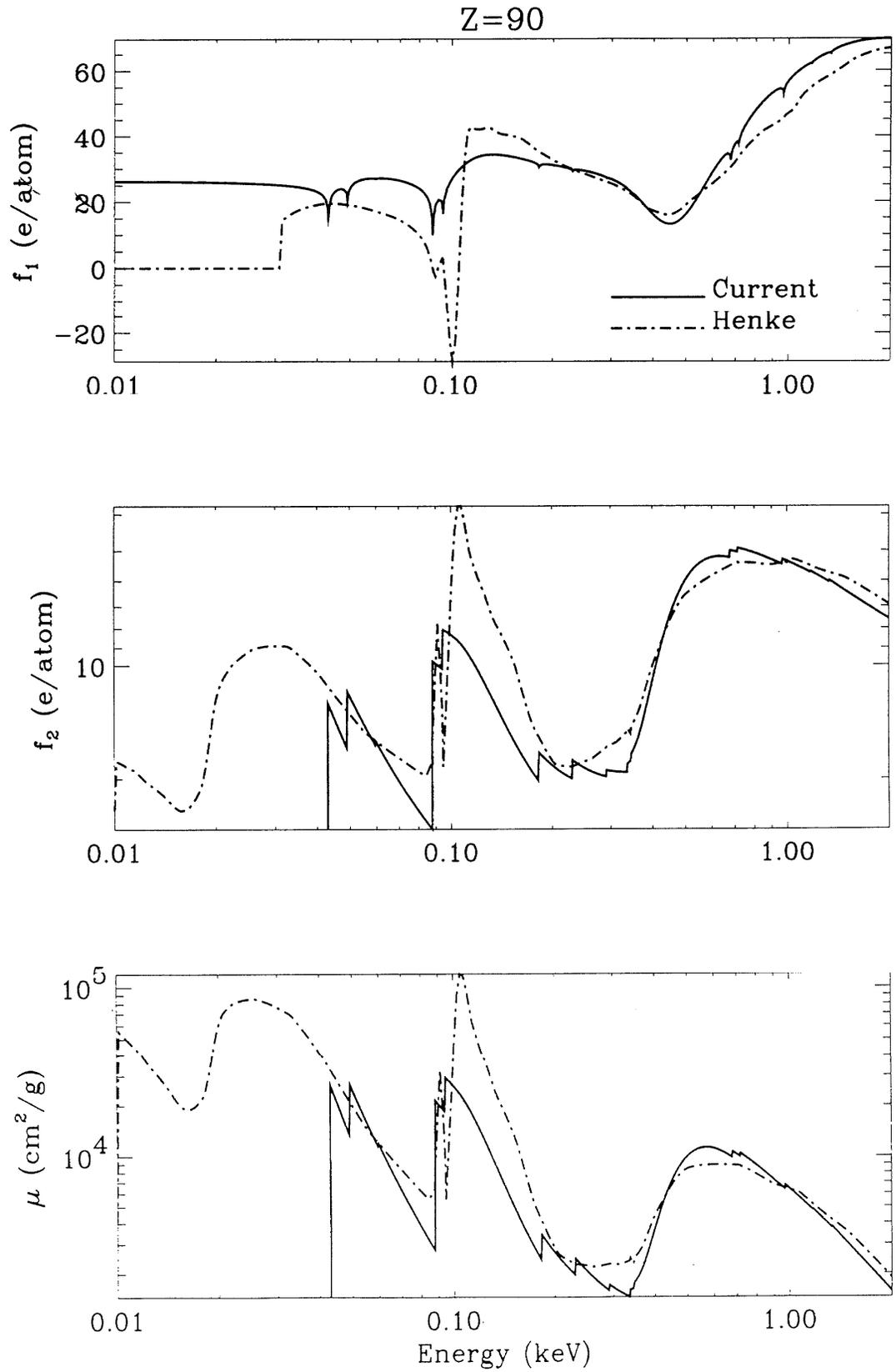
TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

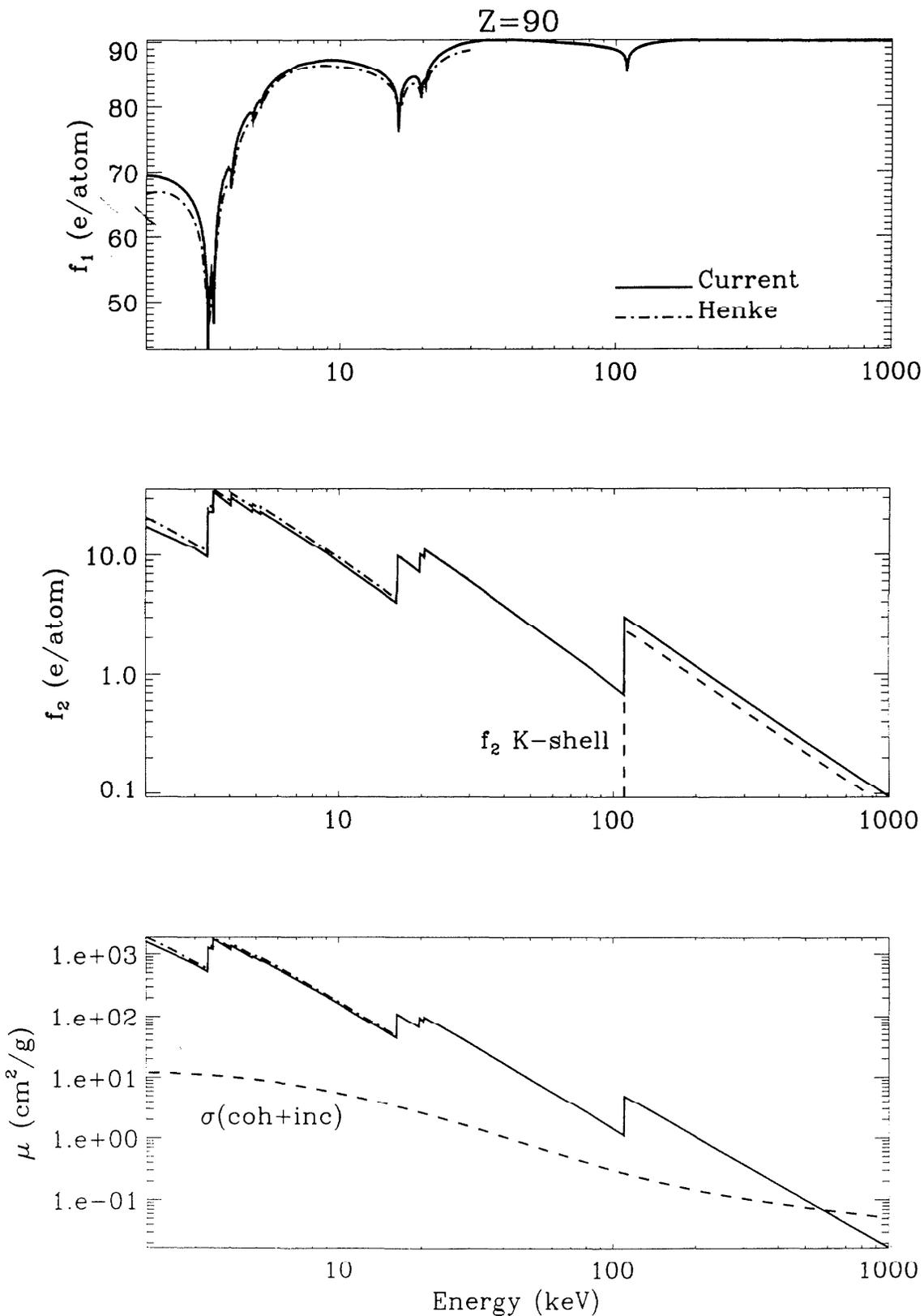
E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
4.127022E+00	7.28891E+01	2.9725E+01	1.3062E+03	1.0139E+01	0.000E+00	3.004E-01
4.334821E+00	7.64784E+01	2.7409E+01	1.1467E+03	9.9084E+00	0.000E+00	2.860E-01
4.633924E+00	7.88363E+01	2.4678E+01	9.6579E+02	9.5817E+00	0.000E+00	2.676E-01
4.733792E+00	7.91340E+01	2.3854E+01	9.1383E+02	9.4745E+00	0.000E+00	2.619E-01
4.806248E+00	7.88658E+01	2.3286E+01	8.7864E+02	9.3974E+00	0.000E+00	2.580E-01
4.825570E+00	7.81943E+01	2.3139E+01	8.6959E+02	9.3769E+00	0.000E+00	2.569E-01
4.854552E+00	7.90758E+01	2.4418E+01	9.1218E+02	9.3463E+00	0.000E+00	2.554E-01
4.927008E+00	8.00402E+01	2.3885E+01	8.7914E+02	9.2702E+00	0.000E+00	2.516E-01
4.953664E+00	8.02534E+01	2.3694E+01	8.6743E+02	9.2423E+00	0.000E+00	2.503E-01
5.078654E+00	8.09038E+01	2.2836E+01	8.1545E+02	9.1128E+00	0.000E+00	2.441E-01
5.156389E+00	8.09152E+01	2.2329E+01	7.8533E+02	9.0332E+00	0.000E+00	2.404E-01
5.177118E+00	8.05251E+01	2.2198E+01	7.7757E+02	9.0121E+00	0.000E+00	2.395E-01
5.208212E+00	8.11716E+01	2.2975E+01	7.9999E+02	8.9806E+00	0.000E+00	2.381E-01
5.285946E+00	8.19615E+01	2.2498E+01	7.7187E+02	8.9022E+00	0.000E+00	2.346E-01
5.295467E+00	8.20302E+01	2.2440E+01	7.6850E+02	8.8927E+00	0.000E+00	2.341E-01
5.660853E+00	8.37431E+01	2.0400E+01	6.5352E+02	8.5353E+00	0.000E+00	2.190E-01
6.051453E+00	8.48168E+01	1.8549E+01	5.5588E+02	8.1724E+00	0.000E+00	2.049E-01
6.469004E+00	8.55864E+01	1.6866E+01	4.7281E+02	7.8062E+00	0.000E+00	1.917E-01
6.915365E+00	8.62858E+01	1.5296E+01	4.0112E+02	7.4389E+00	0.000E+00	1.793E-01
7.392525E+00	8.67388E+01	1.3846E+01	3.3966E+02	7.0725E+00	0.000E+00	1.677E-01
7.902609E+00	8.69518E+01	1.2553E+01	2.8806E+02	6.7088E+00	0.000E+00	1.569E-01
8.447890E+00	8.71749E+01	1.1388E+01	2.4447E+02	6.3496E+00	0.000E+00	1.468E-01
9.030794E+00	8.73194E+01	1.0307E+01	2.0698E+02	5.9964E+00	0.000E+00	1.373E-01
9.653919E+00	8.72509E+01	9.2288E+00	1.7337E+02	5.6506E+00	0.000E+00	1.284E-01
1.032004E+01	8.71265E+01	8.2609E+00	1.4517E+02	5.3134E+00	0.000E+00	1.201E-01
1.103212E+01	8.68947E+01	7.3993E+00	1.2163E+02	4.9861E+00	0.000E+00	1.124E-01
1.179334E+01	8.65667E+01	6.6379E+00	1.0207E+02	4.6694E+00	0.000E+00	1.051E-01
1.260708E+01	8.61496E+01	5.9644E+00	8.5796E+01	4.3641E+00	0.000E+00	9.834E-02
1.347697E+01	8.56059E+01	5.3635E+00	7.2173E+01	4.0709E+00	0.000E+00	9.200E-02
1.440688E+01	8.48326E+01	4.8281E+00	6.0776E+01	3.7903E+00	0.000E+00	8.606E-02
1.540095E+01	8.34505E+01	4.3400E+00	5.1104E+01	3.5225E+00	0.000E+00	8.050E-02
1.597429E+01	8.16017E+01	4.0941E+00	4.6479E+01	3.3813E+00	0.000E+00	7.761E-02
1.621880E+01	7.90611E+01	3.9969E+00	4.4691E+01	3.3238E+00	0.000E+00	7.644E-02
1.628400E+01	7.60712E+01	3.9716E+00	4.4231E+01	3.3088E+00	0.000E+00	7.614E-02
1.638180E+01	7.90529E+01	9.7880E+00	1.0836E+02	3.2863E+00	0.000E+00	7.568E-02
1.646362E+01	8.03818E+01	9.7109E+00	1.0697E+02	3.2678E+00	0.000E+00	7.531E-02
1.662631E+01	8.17029E+01	9.5605E+00	1.0428E+02	3.2314E+00	0.000E+00	7.457E-02
1.759961E+01	8.41490E+01	8.7161E+00	8.9813E+01	3.0263E+00	0.000E+00	7.045E-02
1.881398E+01	8.45346E+01	7.7725E+00	7.4920E+01	2.7980E+00	0.000E+00	6.590E-02
1.929934E+01	8.40137E+01	7.4369E+00	6.9883E+01	2.7143E+00	0.000E+00	6.424E-02
1.959473E+01	8.27868E+01	7.2435E+00	6.7039E+01	2.6653E+00	0.000E+00	6.327E-02
1.967351E+01	8.12699E+01	7.1932E+00	6.6307E+01	2.6525E+00	0.000E+00	6.302E-02
1.979167E+01	8.27857E+01	1.0103E+01	9.2578E+01	2.6334E+00	0.000E+00	6.264E-02
2.006266E+01	8.39989E+01	9.8825E+00	8.9330E+01	2.5905E+00	0.000E+00	6.180E-02
2.008706E+01	8.40465E+01	9.8630E+00	8.9045E+01	2.5867E+00	0.000E+00	6.172E-02
2.011215E+01	8.40894E+01	9.8430E+00	8.8754E+01	2.5828E+00	0.000E+00	6.165E-02
2.036974E+01	8.41042E+01	9.6416E+00	8.5838E+01	2.5432E+00	0.000E+00	6.087E-02
2.045163E+01	8.34960E+01	9.5789E+00	8.4939E+01	2.5309E+00	0.000E+00	6.062E-02
2.057446E+01	8.44507E+01	1.0973E+01	9.6723E+01	2.5125E+00	0.000E+00	6.026E-02
2.088154E+01	8.55442E+01	1.0734E+01	9.3221E+01	2.4674E+00	0.000E+00	5.938E-02
2.149988E+01	8.66258E+01	1.0271E+01	8.6632E+01	2.3805E+00	0.000E+00	5.767E-02
2.298338E+01	8.79963E+01	9.2629E+00	7.3089E+01	2.1909E+00	0.000E+00	5.395E-02
2.456923E+01	8.88005E+01	8.3504E+00	6.1636E+01	2.0136E+00	0.000E+00	5.046E-02
2.626450E+01	8.93430E+01	7.5314E+00	5.2003E+01	1.8482E+00	0.000E+00	4.721E-02
2.807676E+01	8.97360E+01	6.7506E+00	4.3603E+01	1.6944E+00	0.000E+00	4.416E-02
3.001405E+01	8.99689E+01	6.0420E+00	3.6507E+01	1.5517E+00	0.000E+00	4.131E-02
3.208502E+01	9.01138E+01	5.4126E+00	3.0593E+01	1.4195E+00	0.000E+00	3.864E-02
3.429889E+01	9.02537E+01	4.8420E+00	2.5602E+01	1.2974E+00	0.000E+00	3.615E-02
3.666551E+01	9.02855E+01	4.3329E+00	2.1431E+01	1.1849E+00	0.000E+00	3.381E-02
3.919543E+01	9.02857E+01	3.8815E+00	1.7959E+01	1.0814E+00	0.000E+00	3.163E-02
4.189992E+01	9.03247E+01	3.4680E+00	1.5010E+01	9.8643E-01	0.000E+00	2.959E-02
4.479101E+01	9.02774E+01	3.0935E+00	1.2525E+01	8.9943E-01	0.000E+00	2.768E-02
4.788159E+01	9.02124E+01	2.7615E+00	1.0459E+01	8.1990E-01	0.000E+00	2.589E-02
5.118542E+01	9.01362E+01	2.4670E+00	8.7406E+00	7.4733E-01	0.000E+00	2.422E-02
5.471721E+01	9.00521E+01	2.2056E+00	7.3101E+00	6.8123E-01	0.000E+00	2.266E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 627

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
5.849270E+01	8.99624E+01	1.9734E+00	6.1184E+00	6.2112E-01	0.000E+00	2.120E-02
6.252870E+01	8.98678E+01	1.7670E+00	5.1248E+00	5.6655E-01	0.000E+00	1.983E-02
6.684318E+01	8.97685E+01	1.5833E+00	4.2957E+00	5.1708E-01	0.000E+00	1.855E-02
7.145536E+01	8.96635E+01	1.4194E+00	3.6023E+00	4.7230E-01	0.000E+00	1.735E-02
7.638578E+01	8.95493E+01	1.2714E+00	3.0185E+00	4.3182E-01	0.000E+00	1.623E-02
8.165640E+01	8.94238E+01	1.1368E+00	2.5247E+00	3.9526E-01	0.000E+00	1.518E-02
8.729069E+01	8.92693E+01	1.0106E+00	2.0997E+00	3.6229E-01	0.000E+00	1.420E-02
9.331374E+01	8.90604E+01	8.9633E-01	1.7420E+00	3.3257E-01	0.000E+00	1.329E-02
9.975239E+01	8.87342E+01	7.9500E-01	1.4453E+00	3.0581E-01	0.000E+00	1.243E-02
1.066353E+02	8.79446E+01	7.0562E-01	1.2000E+00	2.8173E-01	0.000E+00	1.163E-02
1.074579E+02	8.77255E+01	6.9603E-01	1.1747E+00	2.7912E-01	0.000E+00	1.154E-02
1.091026E+02	8.67428E+01	6.7747E-01	1.1261E+00	2.7405E-01	0.000E+00	1.136E-02
1.095413E+02	8.55680E+01	6.7265E-01	1.1136E+00	2.7273E-01	0.000E+00	1.132E-02
1.101992E+02	8.67915E+01	2.9769E+00	4.8990E+00	2.7077E-01	3.804E+00	1.125E-02
1.118439E+02	8.78609E+01	2.9101E+00	4.7186E+00	2.6602E-01	3.667E+00	1.109E-02
1.139931E+02	8.84013E+01	2.8262E+00	4.4961E+00	2.6007E-01	3.499E+00	1.088E-02
1.218587E+02	8.92165E+01	2.5488E+00	3.7931E+00	2.4058E-01	2.964E+00	1.017E-02
1.302669E+02	8.95995E+01	2.2961E+00	3.1965E+00	2.2306E-01	2.507E+00	9.518E-03
1.392553E+02	8.98307E+01	2.0668E+00	2.6916E+00	2.0730E-01	2.117E+00	8.903E-03
1.488640E+02	8.99822E+01	1.8601E+00	2.2660E+00	1.9311E-01	1.788E+00	8.329E-03
1.591356E+02	9.00854E+01	1.6732E+00	1.9068E+00	1.8033E-01	1.508E+00	7.791E-03
1.701159E+02	9.01548E+01	1.5039E+00	1.6032E+00	1.6881E-01	1.270E+00	7.288E-03
1.818539E+02	9.02007E+01	1.3518E+00	1.3481E+00	1.5842E-01	1.070E+00	6.818E-03
1.944018E+02	9.02299E+01	1.2151E+00	1.1336E+00	1.4901E-01	9.015E-01	6.378E-03
2.078156E+02	9.02469E+01	1.0924E+00	9.5331E-01	1.4050E-01	7.594E-01	5.966E-03
2.221548E+02	9.02549E+01	9.8224E-01	8.0183E-01	1.3276E-01	6.396E-01	5.581E-03
2.374835E+02	9.02562E+01	8.8375E-01	6.7486E-01	1.2572E-01	5.391E-01	5.221E-03
2.538699E+02	9.02533E+01	7.9550E-01	5.6826E-01	1.1930E-01	4.546E-01	4.884E-03
2.713869E+02	9.02471E+01	7.1615E-01	4.7856E-01	1.1342E-01	3.834E-01	4.569E-03
2.901126E+02	9.02387E+01	6.4479E-01	4.0306E-01	1.0802E-01	3.233E-01	4.274E-03
3.101304E+02	9.02286E+01	5.8061E-01	3.3951E-01	1.0304E-01	2.726E-01	3.998E-03
3.315294E+02	9.02174E+01	5.2287E-01	2.8602E-01	9.8428E-02	2.299E-01	3.740E-03
3.544049E+02	9.02056E+01	4.7092E-01	2.4097E-01	9.4150E-02	1.938E-01	3.498E-03
3.788588E+02	9.01936E+01	4.2417E-01	2.0304E-01	9.0161E-02	1.635E-01	3.273E-03
4.050001E+02	9.01815E+01	3.8211E-01	1.7110E-01	8.6429E-02	1.378E-01	3.061E-03
4.329451E+02	9.01695E+01	3.4424E-01	1.4420E-01	8.2922E-02	1.162E-01	2.864E-03





Pa Z = 91

Atomic weight = 2.310359E+02 g/mol, nominal density ρ (g/cm³) = 1.5340E+01 μ_a (barns/atom) = μ (cm²/g) \times 3.83644E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.82138E+05

24 edges. Edge energies (keV):

K		1.12601E+02	L	I	2.11046E+00	L	II	2.03137E+00	L	III	1.67331E+01
M	I	5.36690E+00	M	II	5.00090E+00	M	III	4.17380E+00	M	IV	3.61120E+00
M	V	3.44180E+00	N	I	1.38710E+00	N	II	1.22430E+00	N	III	1.00670E+00
N	IV	7.43400E-00	N	V	7.08200E-00	N	VI	3.71200E-00	N	VII	3.59500E-01
O	I	3.09600E-00	O	II	2.33624E-00	O	III	1.83050E-00	O	IV	9.66789E-02
O	V	8.92408E-02	P	I	4.54585E-02	P	II	2.85451E-02	P	III	2.03206E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.5033E+00, -1.4526E+00 e/atomNuclear Thomson correction f_{NT} = -1.9663E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	σ (coh+inc) cm ² /g	μ_K cm ² /g	λ nm
1.069000E-02	2.50708E+01	0.0000E+00	0.0000E+00	1.1911E-04	0.000E+00	1.160E+02
1.142761E-02	2.49705E+01	0.0000E+00	0.0000E+00	1.6472E-04	0.000E+00	1.085E+02
1.221612E-02	2.48477E+01	0.0000E+00	0.0000E+00	2.2657E-04	0.000E+00	1.015E+02
1.305903E-02	2.46946E+01	0.0000E+00	0.0000E+00	3.0998E-04	0.000E+00	9.494E+01
1.396010E-02	2.44998E+01	0.0000E+00	0.0000E+00	4.2187E-04	0.000E+00	8.881E+01
1.492335E-02	2.42445E+01	0.0000E+00	0.0000E+00	5.7112E-04	0.000E+00	8.308E+01
1.595306E-02	2.38950E+01	0.0000E+00	0.0000E+00	7.6912E-04	0.000E+00	7.772E+01
1.705382E-02	2.33822E+01	0.0000E+00	0.0000E+00	1.0304E-03	0.000E+00	7.270E+01
1.823053E-02	2.25268E+01	0.0000E+00	0.0000E+00	1.3733E-03	0.000E+00	6.801E+01
1.948844E-02	2.05469E+01	0.0000E+00	0.0000E+00	1.8209E-03	0.000E+00	6.362E+01
1.991416E-02	1.88448E+01	0.0000E+00	0.0000E+00	1.9930E-03	0.000E+00	6.226E+01
2.021897E-02	1.52893E+01	0.0000E+00	0.0000E+00	2.1229E-03	0.000E+00	6.132E+01
2.030025E-02	1.09389E+01	0.0000E+00	0.0000E+00	2.1585E-03	0.000E+00	6.108E+01
2.042217E-02	1.56094E+01	8.6095E+00	7.6785E+04	2.2126E-03	0.000E+00	6.071E+01
2.072698E-02	1.97167E+01	8.2733E+00	7.2702E+04	2.3522E-03	0.000E+00	5.982E+01
2.083314E-02	2.04219E+01	8.1605E+00	7.1344E+04	2.4021E-03	0.000E+00	5.951E+01
2.227063E-02	2.43846E+01	6.8204E+00	5.5780E+04	3.1528E-03	0.000E+00	5.567E+01
2.380730E-02	2.57184E+01	5.6906E+00	4.3536E+04	4.1172E-03	0.000E+00	5.208E+01
2.545001E-02	2.61112E+01	4.7351E+00	3.3887E+04	5.3496E-03	0.000E+00	4.872E+01
2.720606E-02	2.55660E+01	3.9366E+00	2.6354E+04	6.9163E-03	0.000E+00	4.557E+01
2.797422E-02	2.45268E+01	3.6451E+00	2.3733E+04	7.6876E-03	0.000E+00	4.432E+01
2.840240E-02	2.24967E+01	3.4956E+00	2.2416E+04	8.1410E-03	0.000E+00	4.365E+01
2.851658E-02	1.99372E+01	3.4572E+00	2.2081E+04	8.2649E-03	0.000E+00	4.348E+01
2.868785E-02	2.27492E+01	8.5021E+00	5.3980E+04	8.4529E-03	0.000E+00	4.322E+01
2.908327E-02	2.51408E+01	8.1590E+00	5.1096E+04	8.8977E-03	0.000E+00	4.263E+01
2.911602E-02	2.52510E+01	8.1314E+00	5.0867E+04	8.9352E-03	0.000E+00	4.258E+01
3.109002E-02	2.80231E+01	6.6795E+00	3.9131E+04	1.1390E-02	0.000E+00	3.988E+01
3.323523E-02	2.88788E+01	5.5146E+00	3.0222E+04	1.4510E-02	0.000E+00	3.731E+01
3.552846E-02	2.92112E+01	4.6362E+00	2.3768E+04	1.8395E-02	0.000E+00	3.490E+01
3.797993E-02	2.93172E+01	3.9541E+00	1.8962E+04	2.3207E-02	0.000E+00	3.264E+01
4.060054E-02	2.92964E+01	3.4099E+00	1.5297E+04	2.9137E-02	0.000E+00	3.054E+01
4.340198E-02	2.91722E+01	2.9656E+00	1.2445E+04	3.6409E-02	0.000E+00	2.857E+01
4.454936E-02	2.90710E+01	2.8131E+00	1.1501E+04	3.9673E-02	0.000E+00	2.783E+01
4.523124E-02	2.89320E+01	2.7291E+00	1.0989E+04	4.1692E-02	0.000E+00	2.741E+01
4.541307E-02	2.87868E+01	2.7074E+00	1.0859E+04	4.2240E-02	0.000E+00	2.730E+01
4.568582E-02	2.89250E+01	2.9484E+00	1.1754E+04	4.3071E-02	0.000E+00	2.714E+01
4.639671E-02	2.90279E+01	2.8539E+00	1.1204E+04	4.5281E-02	0.000E+00	2.672E+01
4.959809E-02	2.89993E+01	2.4863E+00	9.1303E+03	5.6030E-02	0.000E+00	2.500E+01
5.302035E-02	2.88226E+01	2.1766E+00	7.4773E+03	6.9056E-02	0.000E+00	2.338E+01
5.667876E-02	2.85661E+01	1.9157E+00	6.1561E+03	8.4686E-02	0.000E+00	2.187E+01
6.058959E-02	2.82300E+01	1.6925E+00	5.0878E+03	1.0337E-01	0.000E+00	2.046E+01
6.477028E-02	2.78004E+01	1.4998E+00	4.2175E+03	1.2561E-01	0.000E+00	1.914E+01
6.923942E-02	2.72176E+01	1.3325E+00	3.5053E+03	1.5194E-01	0.000E+00	1.791E+01
7.401695E-02	2.63971E+01	1.1871E+00	2.9212E+03	1.8295E-01	0.000E+00	1.675E+01
7.912411E-02	2.51189E+01	1.0607E+00	2.4417E+03	2.1931E-01	0.000E+00	1.567E+01
8.458368E-02	2.26037E+01	9.5112E-01	2.0481E+03	2.6172E-01	0.000E+00	1.466E+01
8.745598E-02	1.94682E+01	9.0207E-01	1.8787E+03	2.8546E-01	0.000E+00	1.418E+01
8.879459E-02	1.49770E+01	8.8094E-01	1.8070E+03	2.9685E-01	0.000E+00	1.396E+01
8.915156E-02	9.78526E+00	8.7548E-01	1.7886E+03	2.9993E-01	0.000E+00	1.391E+01

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 631

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _κ cm ² /g	λ nm
8.968700E-02	1.50191E+01	1.0962E+01	2.2261E+04	3.0456E-01	0.000E+00	1.382E+01
9.041995E-02	1.81167E+01	1.0842E+01	2.1839E+04	3.1096E-01	0.000E+00	1.371E+01
9.102561E-02	1.93811E+01	1.0745E+01	2.1499E+04	3.1629E-01	0.000E+00	1.362E+01
9.474531E-02	2.15288E+01	1.0180E+01	1.9570E+04	3.4994E-01	0.000E+00	1.309E+01
9.619550E-02	1.97449E 01	9.9740E+00	1.8885E+04	3.6347E-01	0.000E+00	1.289E+01
9.665893E-02	1.36294E+01	9.9098E+00	1.8673E+04	3.6784E-01	0.000E+00	1.283E+01
9.716228E-02	2.03515E+01	1.6144E+01	3.0263E+04	3.7261E-01	0.000E+00	1.276E+01
9.861247E-02	2.39384E+01	1.5896E+01	2.9360E+04	3.8651E-01	0.000E+00	1.257E+01
1.033284E-01	2.85122E+01	1.4953E+01	2.6358E+04	4.3323E-01	0.000E+00	1.200E+01
1.104581E-01	3.21935E+01	1.3231E+01	2.1817E+04	5.0803E-01	0.000E+00	1.122E+01
1.180797E-01	3.44097E+01	1.1064E+01	1.7066E+04	5.9319E-01	0.000E+00	1.050E+01
1.262272E-01	3.54872E+01	8.8921E+00	1.2831E+04	6.8967E-01	0.000E+00	9.822E+00
1.349368E-01	3.57756E+01	7.0015E+00	9.4507E+03	7.9845E-01	0.000E+00	9.188E+00
1.442475E-01	3.55733E+01	5.4869E+00	6.9281E+03	9.2051E-01	0.000E+00	8.595E+00
1.542005E-01	3.50857E+01	4.3327E+00	5.1176E+03	1.0568E+00	0.000E+00	8.040E+00
1.648404E-01	3.44208E+01	3.4783E+00	3.8433E+03	1.2082E+00	0.000E+00	7.521E+00
1.762144E-01	3.35341E+01	2.8555E+00	2.9515E+03	1.3757E+00	0.000E+00	7.036E+00
1.793891E-01	3.31731E+01	2.7202E+00	2.7619E+03	1.4234E+00	0.000E+00	6.911E+00
1.821348E-01	3.25794E+01	2.6140E+00	2.6140E+03	1.4649E+00	0.000E+00	6.807E+00
1.828670E-01	3.20043E+01	2.5872E+00	2.5769E+03	1.4760E+00	0.000E+00	6.780E+00
1.839653E-01	3.25005E+01	3.6043E+00	3.5685E+03	1.4927E+00	0.000E+00	6.740E+00
1.867111E-01	3.28435E+01	3.5009E+00	3.4152E+03	1.5346E+00	0.000E+00	6.640E+00
1.883732E-01	3.28928E+01	3.4423E+00	3.3283E+03	1.5600E+00	0.000E+00	6.582E+00
2.013709E-01	3.26972E+01	3.0665E+00	2.7736E+03	1.7619E+00	0.000E+00	6.157E+00
2.152655E-01	3.22041E+01	2.7907E+00	2.3612E+03	1.9818E+00	0.000E+00	5.760E+00
2.289513E-01	3.15075E+01	2.6069E+00	2.0738E+03	2.2015E+00	0.000E+00	5.415E+00
2.301188E-01	3.14129E+01	2.5942E+00	2.0533E+03	2.2204E+00	0.000E+00	5.388E+00
2.324557E-01	3.11167E+01	2.5700E+00	2.0137E+03	2.2581E+00	0.000E+00	5.334E+00
2.333902E-01	3.07558E+01	2.5607E+00	1.9984E+03	2.2733E+00	0.000E+00	5.312E+00
2.347919E-01	3.10590E+01	3.1961E+00	2.4793E+03	2.2960E+00	0.000E+00	5.281E+00
2.382963E-01	3.12429E+01	3.1371E+00	2.3978E+03	2.3527E+00	0.000E+00	5.203E+00
2.459970E-01	3.11804E+01	3.0226E+00	2.2380E+03	2.4778E+00	0.000E+00	5.040E+00
2.629708E-01	3.06892E+01	2.8300E+00	1.9601E+03	2.7543E+00	0.000E+00	4.715E+00
2.811158E-01	2.99713E+01	2.6972E+00	1.7476E+03	3.0496E+00	0.000E+00	4.410E+00
3.005128E-01	2.90080E+01	2.6116E+00	1.5829E+03	3.3636E+00	0.000E+00	4.126E+00
3.034080E-01	2.88368E+01	2.6025E+00	1.5623E+03	3.4103E+00	0.000E+00	4.086E+00
3.080520E-01	2.85018E+01	2.5895E+00	1.5311E+03	3.4849E+00	0.000E+00	4.025E+00
3.092904E-01	2.83273E+01	2.5864E+00	1.5231E+03	3.5048E+00	0.000E+00	4.009E+00
3.111480E-01	2.83342E+01	2.7934E+00	1.6352E+03	3.5345E+00	0.000E+00	3.985E+00
3.157920E-01	2.81673E+01	2.7850E+00	1.6063E+03	3.6088E+00	0.000E+00	3.926E+00
3.212482E-01	2.78892E+01	2.7772E+00	1.5746E+03	3.6958E+00	0.000E+00	3.859E+00
3.434143E-01	2.64306E+01	2.7633E+00	1.4656E+03	4.0453E+00	0.000E+00	3.610E+00
3.523100E-01	2.56656E+01	2.7641E+00	1.4290E+03	4.1837E+00	0.000E+00	3.519E+00
3.577025E-01	2.50689E+01	2.7659E+00	1.4084E+03	4.2670E+00	0.000E+00	3.466E+00
3.591405E-01	2.48016E+01	2.7665E+00	1.4030E+03	4.2891E+00	0.000E+00	3.452E+00
3.612975E-01	2.46890E+01	3.0222E+00	1.5236E+03	4.3223E+00	0.000E+00	3.432E+00
3.637760E-01	2.44868E+01	3.0540E+00	1.5291E+03	4.3603E+00	0.000E+00	3.408E+00
3.666900E-01	2.41950E+01	3.0960E+00	1.5378E+03	4.4048E+00	0.000E+00	3.381E+00
3.671099E-01	2.41491E+01	3.1025E+00	1.5393E+03	4.4112E+00	0.000E+00	3.377E+00
3.693440E-01	2.38800E+01	3.1391E+00	1.5480E+03	4.4453E+00	0.000E+00	3.357E+00
3.708288E-01	2.36267E+01	3.1653E+00	1.5547E+03	4.4679E+00	0.000E+00	3.343E+00
3.730560E-01	2.34759E+01	3.4110E+00	1.6654E+03	4.5017E+00	0.000E+00	3.323E+00
3.786240E-01	2.29352E+01	3.5914E+00	1.7277E+03	4.5858E+00	0.000E+00	3.275E+00
3.924405E-01	2.13116E+01	4.2586E+00	1.9765E+03	4.7923E+00	0.000E+00	3.159E+00
4.195189E-01	1.78707E+01	6.8577E+00	2.9773E+03	5.1870E+00	0.000E+00	2.955E+00
4.484657E-01	1.49563E+01	1.1473E+01	4.6597E+03	5.5936E+00	0.000E+00	2.765E+00
4.794098E-01	1.37542E+01	1.7704E+01	6.7261E+03	6.0101E+00	0.000E+00	2.586E+00
5.124891E-01	1.49624E+01	2.4432E+01	8.6832E+03	6.4343E+00	0.000E+00	2.419E+00
5.478508E-01	1.84317E+01	3.0386E+01	1.0102E+04	6.8638E+00	0.000E+00	2.263E+00
5.856525E-01	2.33653E+01	3.4702E+01	1.0792E+04	7.2960E+00	0.000E+00	2.117E+00
6.260625E-01	2.87149E+01	3.7107E+01	1.0795E+04	7.7281E+00	0.000E+00	1.980E+00
6.692609E-01	3.33920E+01	3.7790E+01	1.0284E+04	8.1573E+00	0.000E+00	1.853E+00
6.940360E-01	3.48809E+01	3.7581E+01	9.8624E+03	8.3889E+00	0.000E+00	1.786E+00
7.046590E-01	3.42970E+01	3.7396E+01	9.6659E+03	8.4850E+00	0.000E+00	1.759E+00
7.074918E-01	3.27413E+01	3.7338E+01	9.6125E+03	8.5103E+00	0.000E+00	1.752E+00

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
7.117410E-01	3.48461E+01	4.0747E+01	1.0427E+04	8.5480E+00	0.000E+00	1.742E+00
7.154399E-01	3.59109E+01	4.0683E+01	1.0357E+04	8.5806E+00	0.000E+00	1.733E+00
7.223640E-01	3.71181E+01	4.0551E+01	1.0225E+04	8.6411E+00	0.000E+00	1.716E+00
7.285320E-01	3.78521E+01	4.0421E+01	1.0105E+04	8.6943E+00	0.000E+00	1.702E+00
7.396830E-01	3.83786E+01	4.0159E+01	9.8887E+03	8.7889E+00	0.000E+00	1.676E+00
7.426566E-01	3.76376E+01	4.0084E+01	9.8308E+03	8.8138E+00	0.000E+00	1.669E+00
7.471170E-01	3.92231E+01	4.2107E+01	1.0265E+04	8.8509E+00	0.000E+00	1.660E+00
7.582680E-01	4.13366E+01	4.1842E+01	1.0051E+04	8.9423E+00	0.000E+00	1.635E+00
7.648052E-01	4.22280E+01	4.1677E+01	9.9254E+03	8.9950E+00	0.000E+00	1.621E+00
8.175768E-01	4.74197E+01	4.0170E+01	8.9489E+03	9.3975E+00	0.000E+00	1.516E+00
8.739896E-01	5.12441E+01	3.8376E+01	7.9975E+03	9.7849E+00	0.000E+00	1.419E+00
9.342948E-01	5.41140E+01	3.6464E+01	7.1086E+03	1.0154E+01	0.000E+00	1.327E+00
9.865660E-01	5.54733E+01	3.4914E+01	6.4457E+03	1.0441E+01	0.000E+00	1.257E+00
9.987612E-01	5.52614E+01	3.4569E+01	6.3041E+03	1.0503E+01	0.000E+00	1.241E+00
1.001667E+00	5.50287E+01	3.4483E+01	6.2702E+03	1.0518E+01	0.000E+00	1.238E+00
1.005693E+00	5.39388E+01	3.4360E+01	6.2227E+03	1.0538E+01	0.000E+00	1.233E+00
1.011734E+00	5.54380E+01	3.6621E+01	6.5927E+03	1.0568E+01	0.000E+00	1.225E+00
1.026834E+00	5.71018E+01	3.6093E+01	6.4021E+03	1.0641E+01	0.000E+00	1.207E+00
1.067676E+00	5.92296E+01	3.4753E+01	5.9286E+03	1.0828E+01	0.000E+00	1.161E+00
1.141345E+00	6.16897E+01	3.2727E+01	5.2226E+03	1.1128E+01	0.000E+00	1.086E+00
1.199814E+00	6.30658E+01	3.1325E+01	4.7553E+03	1.1333E+01	0.000E+00	1.033E+00
1.218179E+00	6.33013E+01	3.0879E+01	4.6169E+03	1.1392E+01	0.000E+00	1.018E+00
1.220098E+00	6.32904E+01	3.0833E+01	4.6028E+03	1.1398E+01	0.000E+00	1.016E+00
1.223076E+00	6.31774E+01	3.0763E+01	4.5811E+03	1.1408E+01	0.000E+00	1.014E+00
1.230422E+00	6.35866E+01	3.1051E+01	4.5964E+03	1.1430E+01	0.000E+00	1.008E+00
1.248786E+00	6.41887E+01	3.0619E+01	4.4658E+03	1.1486E+01	0.000E+00	9.928E-01
1.304285E+00	6.53954E+01	2.9327E+01	4.0954E+03	1.1639E+01	0.000E+00	9.506E-01
1.359358E+00	6.62232E+01	2.8118E+01	3.7675E+03	1.1772E+01	0.000E+00	9.121E-01
1.380164E+00	6.63250E+01	2.7685E+01	3.6536E+03	1.1817E+01	0.000E+00	8.983E-01
1.385713E+00	6.61400E+01	2.7572E+01	3.6241E+03	1.1829E+01	0.000E+00	8.947E-01
1.394281E+00	6.65556E+01	2.7928E+01	3.6483E+03	1.1847E+01	0.000E+00	8.892E-01
1.414842E+00	6.70838E+01	2.7526E+01	3.5435E+03	1.1888E+01	0.000E+00	8.763E-01
1.490486E+00	6.82841E+01	2.6009E+01	3.1783E+03	1.2021E+01	0.000E+00	8.318E-01
1.593329E+00	6.93211E+01	2.4006E+01	2.7442E+03	1.2161E+01	0.000E+00	7.781E-01
1.703269E+00	7.00083E+01	2.2179E+01	2.3717E+03	1.2264E+01	0.000E+00	7.279E-01
1.820795E+00	7.04447E+01	2.0512E+01	2.0518E+03	1.2331E+01	0.000E+00	6.809E-01
1.946430E+00	7.06811E+01	1.8990E+01	1.7770E+03	1.2362E+01	0.000E+00	6.370E-01
2.080733E+00	7.08077E+01	1.7607E+01	1.5413E+03	1.2356E+01	0.000E+00	5.959E-01
2.224304E+00	7.07175E+01	1.6348E+01	1.3386E+03	1.2314E+01	0.000E+00	5.574E-01
2.377781E+00	7.04533E+01	1.5209E+01	1.1650E+03	1.2237E+01	0.000E+00	5.214E-01
2.541848E+00	6.99855E+01	1.4174E+01	1.0156E+03	1.2125E+01	0.000E+00	4.878E-01
2.717235E+00	6.92284E+01	1.3230E+01	8.8680E+02	1.1981E+01	0.000E+00	4.563E-01
2.904724E+00	6.80338E+01	1.2341E+01	7.7382E+02	1.1805E+01	0.000E+00	4.268E-01
3.105150E+00	6.60065E+01	1.1284E+01	6.6191E+02	1.1600E+01	0.000E+00	3.993E-01
3.319406E+00	6.09274E+01	1.0182E+01	5.5871E+02	1.1367E+01	0.000E+00	3.735E-01
3.372964E+00	5.81306E+01	9.9380E+00	5.3664E+02	1.1308E+01	0.000E+00	3.676E-01
3.424591E+00	5.20006E+01	9.7128E+00	5.1658E+02	1.1250E+01	0.000E+00	3.620E-01
3.438358E+00	4.55480E+01	9.6543E+00	5.1141E+02	1.1234E+01	0.000E+00	3.606E-01
3.459009E+00	5.08881E+01	2.1709E+01	1.1431E+03	1.1211E+01	0.000E+00	3.584E-01
3.510636E+00	5.48531E+01	2.2103E+01	1.1468E+03	1.1152E+01	0.000E+00	3.532E-01
3.538976E+00	5.52403E+01	2.2332E+01	1.1494E+03	1.1120E+01	0.000E+00	3.503E-01
3.548445E+00	5.52074E+01	2.2411E+01	1.1503E+03	1.1109E+01	0.000E+00	3.494E-01
3.593144E+00	5.29824E+01	2.2795E+01	1.1555E+03	1.1058E+01	0.000E+00	3.451E-01
3.607589E+00	4.83109E+01	2.2924E+01	1.1574E+03	1.1042E+01	0.000E+00	3.437E-01
3.629256E+00	5.44110E+01	3.3167E+01	1.6645E+03	1.1017E+01	0.000E+00	3.416E-01
3.683424E+00	6.07885E+01	3.2669E+01	1.6154E+03	1.0955E+01	0.000E+00	3.366E-01
3.793288E+00	6.63647E+01	3.1445E+01	1.5099E+03	1.0828E+01	0.000E+00	3.269E-01
4.055024E+00	7.18484E+01	2.8132E+01	1.2636E+03	1.0527E+01	0.000E+00	3.058E-01
4.090324E+00	7.19797E+01	2.7673E+01	1.2323E+03	1.0486E+01	0.000E+00	3.031E-01
4.152931E+00	7.10026E+01	2.6869E+01	1.1784E+03	1.0414E+01	0.000E+00	2.985E-01
4.169626E+00	6.89424E+01	2.6657E+01	1.1644E+03	1.0395E+01	0.000E+00	2.974E-01
4.194669E+00	7.15401E+01	3.0837E+01	1.3390E+03	1.0367E+01	0.000E+00	2.956E-01
4.257276E+00	7.43148E+01	3.0010E+01	1.2839E+03	1.0295E+01	0.000E+00	2.912E-01
4.334821E+00	7.60516E+01	2.9026E+01	1.2196E+03	1.0207E+01	0.000E+00	2.860E-01
4.633924E+00	7.93694E+01	2.5821E+01	1.0149E+03	9.8715E+00	0.000E+00	2.676E-01

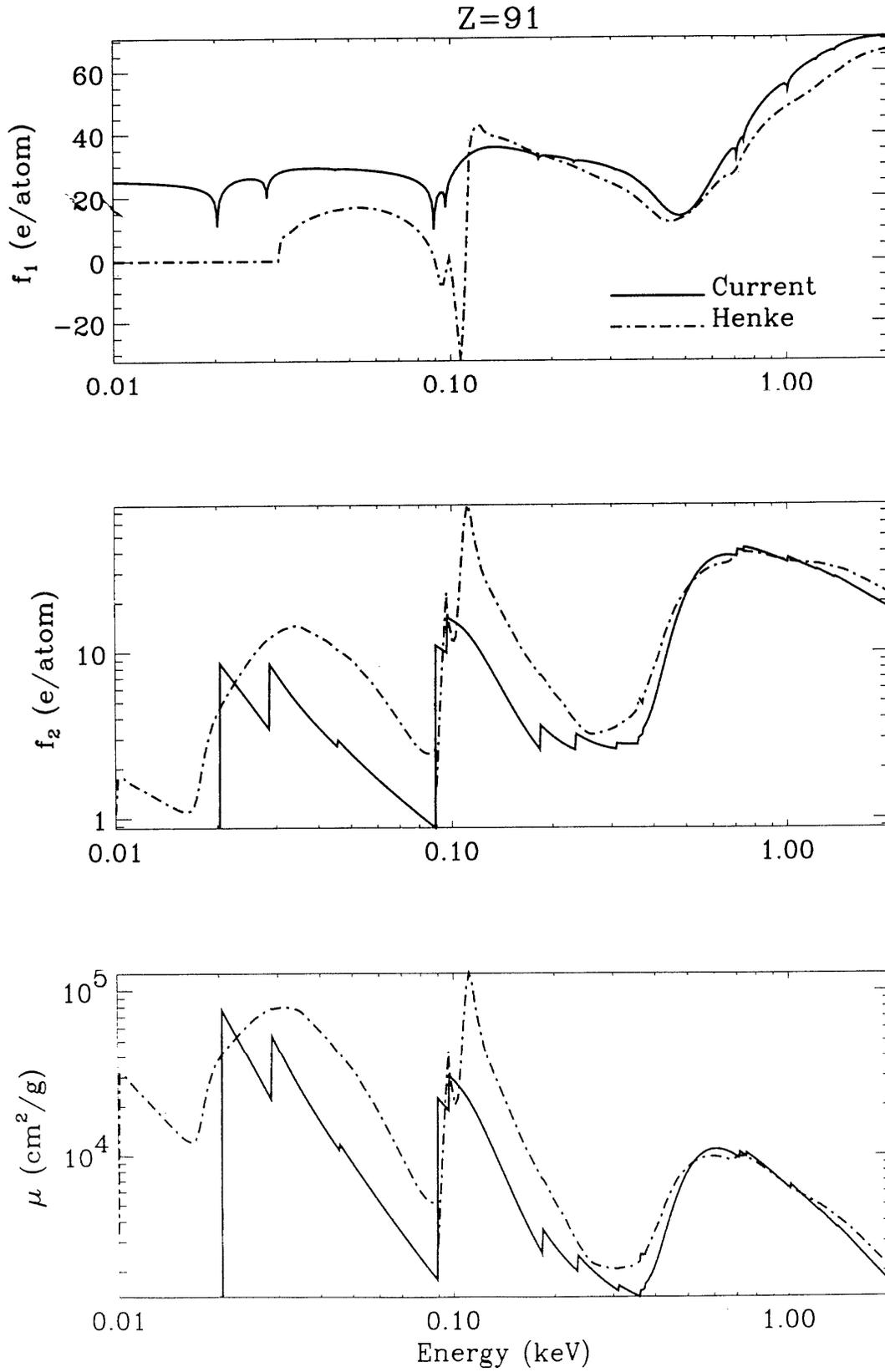
THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 633

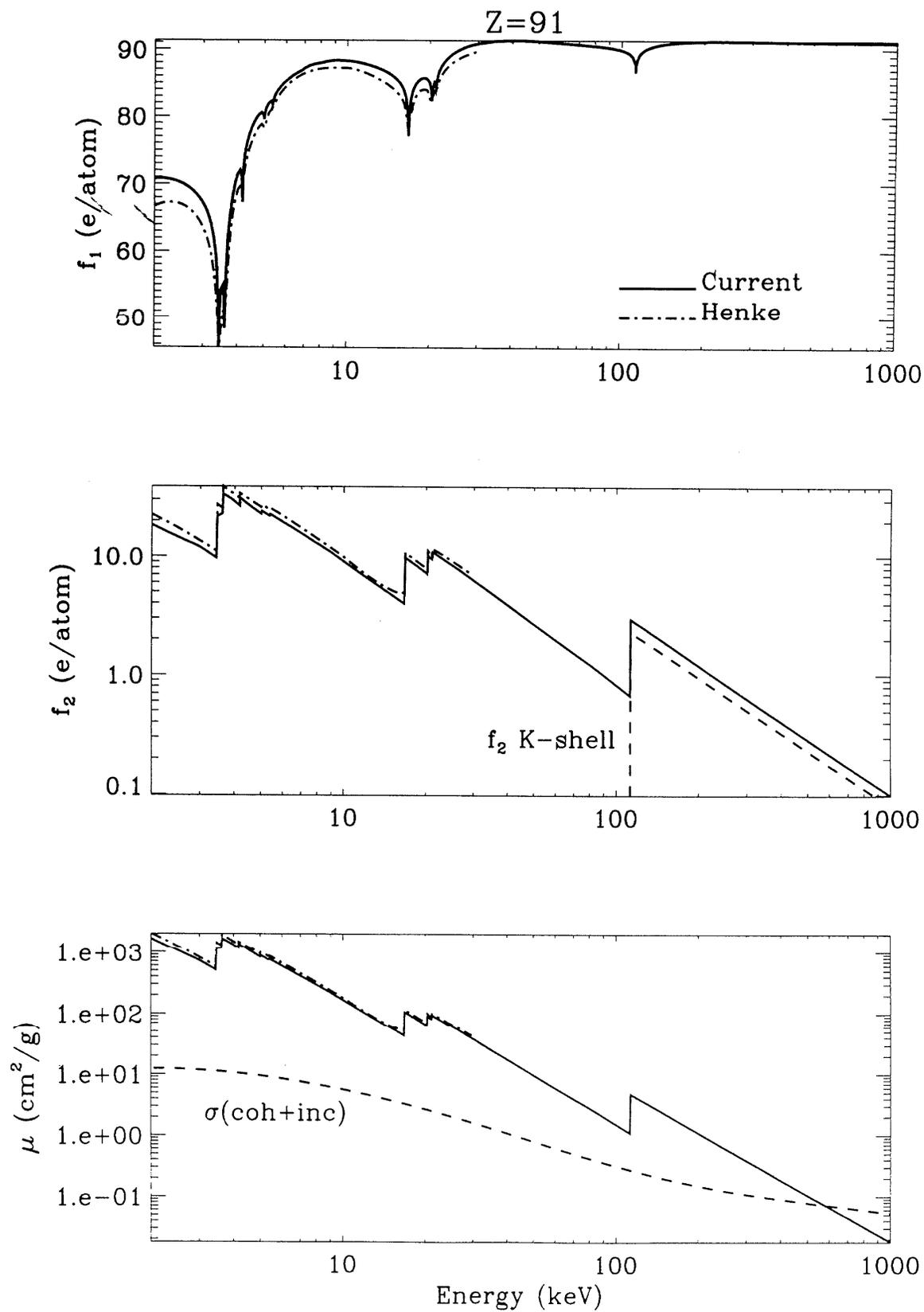
TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _x cm ² /g	λ nm
4.900882E+00	8.05241E+01	2.3541E+01	8.7489E+02	9.5798E+00	0.000E+00	2.530E-01
4.953664E+00	8.04272E+01	2.3135E+01	8.5064E+02	9.5231E+00	0.000E+00	2.503E-01
4.975895E+00	8.02284E+01	2.2968E+01	8.4074E+02	9.4993E+00	0.000E+00	2.492E-01
4.995899E+00	7.95584E+01	2.2820E+01	8.3197E+02	9.4779E+00	0.000E+00	2.482E-01
5.025904E+00	8.04156E+01	2.4078E+01	8.7257E+02	9.4460E+00	0.000E+00	2.467E-01
5.100918E+00	8.13388E+01	2.3547E+01	8.4078E+02	9.3666E+00	0.000E+00	2.431E-01
5.259562E+00	8.21480E+01	2.2501E+01	7.7920E+02	9.2011E+00	0.000E+00	2.357E-01
5.295467E+00	8.22146E+01	2.2277E+01	7.6621E+02	9.1640E+00	0.000E+00	2.341E-01
5.340065E+00	8.21358E+01	2.2004E+01	7.5049E+02	9.1183E+00	0.000E+00	2.322E-01
5.361533E+00	8.17427E+01	2.1874E+01	7.4310E+02	9.0964E+00	0.000E+00	2.312E-01
5.393734E+00	8.23772E+01	2.2649E+01	7.6481E+02	9.0636E+00	0.000E+00	2.299E-01
5.474238E+00	8.31425E+01	2.2178E+01	7.3790E+02	8.9822E+00	0.000E+00	2.265E-01
5.660855E+00	8.41112E+01	2.1150E+01	6.8049E+02	8.7969E+00	0.000E+00	2.190E-01
6.051453E+00	8.53779E+01	1.9257E+01	5.7961E+02	8.4240E+00	0.000E+00	2.049E-01
6.469004E+00	8.62622E+01	1.7544E+01	4.9396E+02	8.0477E+00	0.000E+00	1.917E-01
6.915365E+00	8.70698E+01	1.5966E+01	4.2051E+02	7.6701E+00	0.000E+00	1.793E-01
7.392525E+00	8.76251E+01	1.4461E+01	3.5629E+02	7.2934E+00	0.000E+00	1.677E-01
7.902609E+00	8.79055E+01	1.3104E+01	3.0202E+02	6.9194E+00	0.000E+00	1.569E-01
8.447890E+00	8.81798E+01	1.1893E+01	2.5641E+02	6.5499E+00	0.000E+00	1.468E-01
9.030794E+00	8.83335E+01	1.0760E+01	2.1701E+02	6.1865E+00	0.000E+00	1.373E-01
9.653919E+00	8.83089E+01	9.6297E+00	1.8168E+02	5.8307E+00	0.000E+00	1.284E-01
1.032004E+01	8.82175E+01	8.6257E+00	1.5223E+02	5.4837E+00	0.000E+00	1.201E-01
1.103212E+01	8.80177E+01	7.7269E+00	1.2757E+02	5.1467E+00	0.000E+00	1.124E-01
1.179334E+01	8.77227E+01	6.9284E+00	1.0700E+02	4.8207E+00	0.000E+00	1.051E-01
1.260708E+01	8.73451E+01	6.2224E+00	8.9897E+01	4.5063E+00	0.000E+00	9.834E-02
1.347697E+01	8.68612E+01	5.5962E+00	7.5631E+01	4.2043E+00	0.000E+00	9.200E-02
1.440688E+01	8.62028E+01	5.0364E+00	6.3672E+01	3.9152E+00	0.000E+00	8.606E-02
1.540095E+01	8.51599E+01	4.5327E+00	5.3605E+01	3.6393E+00	0.000E+00	8.050E-02
1.639844E+01	8.26512E+01	4.1014E+00	4.5554E+01	3.3920E+00	0.000E+00	7.561E-02
1.646362E+01	8.22583E+01	4.0757E+00	4.5089E+01	3.3768E+00	0.000E+00	7.531E-02
1.664944E+01	8.01210E+01	4.0040E+00	4.3802E+01	3.3340E+00	0.000E+00	7.447E-02
1.671637E+01	7.71410E+01	3.9787E+00	4.3351E+01	3.3188E+00	0.000E+00	7.417E-02
1.681677E+01	8.01159E+01	9.7771E+00	1.0589E+02	3.2962E+00	0.000E+00	7.373E-02
1.706776E+01	8.27610E+01	9.5479E+00	1.0189E+02	3.2407E+00	0.000E+00	7.264E-02
1.759961E+01	8.45178E+01	9.0900E+00	9.4072E+01	3.1279E+00	0.000E+00	7.045E-02
1.881398E+01	8.56756E+01	8.1188E+00	7.8598E+01	2.8925E+00	0.000E+00	6.590E-02
1.990743E+01	8.50829E+01	7.3656E+00	6.7390E+01	2.7037E+00	0.000E+00	6.228E-02
2.011215E+01	8.44801E+01	7.2367E+00	6.5536E+01	2.6706E+00	0.000E+00	6.165E-02
2.021213E+01	8.38530E+01	7.1750E+00	6.4656E+01	2.6546E+00	0.000E+00	6.134E-02
2.029339E+01	8.32394E+01	7.1255E+00	6.3952E+01	2.6418E+00	0.000E+00	6.110E-02
2.041527E+01	8.38467E+01	1.0027E+01	8.9453E+01	2.6227E+00	0.000E+00	6.073E-02
2.068251E+01	8.50222E+01	9.8181E+00	8.6462E+01	2.5815E+00	0.000E+00	5.995E-02
2.071997E+01	8.50933E+01	9.7894E+00	8.6054E+01	2.5758E+00	0.000E+00	5.984E-02
2.099908E+01	8.51412E+01	9.5803E+00	8.3096E+01	2.5341E+00	0.000E+00	5.904E-02
2.108350E+01	8.45398E+01	9.5185E+00	8.2229E+01	2.5217E+00	0.000E+00	5.881E-02
2.121012E+01	8.54892E+01	1.0902E+01	9.3620E+01	2.5033E+00	0.000E+00	5.846E-02
2.149988E+01	8.65135E+01	1.0685E+01	9.0520E+01	2.4619E+00	0.000E+00	5.767E-02
2.152669E+01	8.65772E+01	1.0665E+01	9.0240E+01	2.4582E+00	0.000E+00	5.760E-02
2.298338E+01	8.84990E+01	9.6515E+00	7.6485E+01	2.2663E+00	0.000E+00	5.395E-02
2.456923E+01	8.94946E+01	8.7034E+00	6.4520E+01	2.0833E+00	0.000E+00	5.046E-02
2.626450E+01	9.01380E+01	7.8518E+00	5.4150E+01	1.9126E+00	0.000E+00	4.721E-02
2.807676E+01	9.05887E+01	7.0431E+00	4.5690E+01	1.7538E+00	0.000E+00	4.416E-02
3.001405E+01	9.08676E+01	6.3053E+00	3.8263E+01	1.6064E+00	0.000E+00	4.131E-02
3.208502E+01	9.10439E+01	5.6494E+00	3.2070E+01	1.4699E+00	0.000E+00	3.864E-02
3.429889E+01	9.12097E+01	5.0605E+00	2.6873E+01	1.3438E+00	0.000E+00	3.615E-02
3.666551E+01	9.12605E+01	4.5286E+00	2.2496E+01	1.2275E+00	0.000E+00	3.381E-02
3.919543E+01	9.12730E+01	4.0568E+00	1.8852E+01	1.1205E+00	0.000E+00	3.163E-02
4.189992E+01	9.12968E+01	3.6335E+00	1.5795E+01	1.0223E+00	0.000E+00	2.959E-02
4.479101E+01	9.12866E+01	3.2428E+00	1.3186E+01	9.3231E-01	0.000E+00	2.768E-02
4.788159E+01	9.12296E+01	2.8953E+00	1.1013E+01	8.5003E-01	0.000E+00	2.589E-02
5.118542E+01	9.11591E+01	2.5869E+00	9.2053E+00	7.7492E-01	0.000E+00	2.422E-02
5.471721E+01	9.10794E+01	2.3132E+00	7.7001E+00	7.0649E-01	0.000E+00	2.266E-02
5.849270E+01	9.09933E+01	2.0701E+00	6.4458E+00	6.4425E-01	0.000E+00	2.120E-02
6.252870E+01	9.09020E+01	1.8538E+00	5.4000E+00	5.8772E-01	0.000E+00	1.983E-02
6.684318E+01	9.08060E+01	1.6614E+00	4.5272E+00	5.3646E-01	0.000E+00	1.855E-02

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
7.145536E+01	9.07049E+01	1.4901E+00	3.7983E+00	4.9004E-01	0.000E+00	1.735E-02
7.638578E+01	9.05963E+01	1.3356E+00	3.1848E+00	4.4807E-01	0.000E+00	1.623E-02
8.165640E+01	9.04821E+01	1.1945E+00	2.6644E+00	4.1015E-01	0.000E+00	1.518E-02
8.729069E+01	9.03401E+01	1.0630E+00	2.2180E+00	3.7594E-01	0.000E+00	1.420E-02
9.331374E+01	9.01568E+01	9.4456E-01	1.8437E+00	3.4510E-01	0.000E+00	1.329E-02
9.975239E+01	8.98920E+01	8.3817E-01	1.5304E+00	3.1732E-01	0.000E+00	1.243E-02
1.066353E+02	8.93943E+01	7.4429E-01	1.2713E+00	2.9231E-01	0.000E+00	1.163E-02
1.103494E+02	8.87393E+01	7.0047E-01	1.1562E+00	2.8047E-01	0.000E+00	1.124E-02
1.120384E+02	8.77637E+01	6.8190E-01	1.1085E+00	2.7542E-01	0.000E+00	1.107E-02
1.124888E+02	8.65975E+01	6.7708E-01	1.0963E+00	2.7410E-01	0.000E+00	1.102E-02
1.131644E+02	8.78121E+01	2.9643E+00	4.7711E+00	2.7216E-01	3.693E+00	1.096E-02
1.139931E+02	8.85011E+01	2.9314E+00	4.6837E+00	2.6981E-01	3.627E+00	1.088E-02
1.148534E+02	8.88736E+01	2.8977E+00	4.5953E+00	2.6742E-01	3.560E+00	1.079E-02
1.218587E+02	8.99853E+01	2.6448E+00	3.9531E+00	2.4956E-01	3.074E+00	1.017E-02
1.302669E+02	9.04719E+01	2.3843E+00	3.3336E+00	2.3135E-01	2.602E+00	9.518E-03
1.392553E+02	9.07481E+01	2.1472E+00	2.8084E+00	2.1497E-01	2.199E+00	8.903E-03
1.488640E+02	9.09248E+01	1.9332E+00	2.3654E+00	2.0022E-01	1.857E+00	8.329E-03
1.591356E+02	9.10438E+01	1.7405E+00	1.9921E+00	1.8693E-01	1.568E+00	7.791E-03
1.701159E+02	9.11248E+01	1.5653E+00	1.6759E+00	1.7495E-01	1.322E+00	7.288E-03
1.818539E+02	9.11789E+01	1.4077E+00	1.4099E+00	1.6414E-01	1.115E+00	6.818E-03
1.944018E+02	9.12140E+01	1.2661E+00	1.1862E+00	1.5437E-01	9.395E-01	6.378E-03
2.078156E+02	9.12355E+01	1.1388E+00	9.9811E-01	1.4551E-01	7.918E-01	5.966E-03
2.221548E+02	9.12470E+01	1.0245E+00	8.3994E-01	1.3747E-01	6.674E-01	5.581E-03
2.374835E+02	9.12508E+01	9.2193E-01	7.0707E-01	1.3016E-01	5.626E-01	5.221E-03
2.538699E+02	9.12497E+01	8.3043E-01	5.9578E-01	1.2349E-01	4.748E-01	4.884E-03
2.713869E+02	9.12450E+01	7.4810E-01	5.0207E-01	1.1738E-01	4.007E-01	4.569E-03
2.901126E+02	9.12377E+01	6.7401E-01	4.2315E-01	1.1178E-01	3.381E-01	4.274E-03
3.101304E+02	9.12286E+01	6.0732E-01	3.5668E-01	1.0662E-01	2.854E-01	3.998E-03
3.315294E+02	9.12181E+01	5.4730E-01	3.0068E-01	1.0185E-01	2.408E-01	3.740E-03
3.544049E+02	9.12069E+01	4.9325E-01	2.5350E-01	9.7420E-02	2.032E-01	3.498E-03
3.788588E+02	9.11953E+01	4.4459E-01	2.1374E-01	9.3296E-02	1.715E-01	3.273E-03
4.050001E+02	9.11835E+01	4.0077E-01	1.8024E-01	8.9442E-02	1.447E-01	3.061E-03
4.329451E+02	9.11717E+01	3.6130E-01	1.5200E-01	8.5826E-02	1.221E-01	2.864E-03





THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 637

U Z = 92

Atomic weight = 2.380289E+02 g/mol, nominal density ρ (g/cm³) = 1.8920E+01

μ_a (barns/atom) = μ (cm²/g) \times 3.95257E+02, E (eV) μ (cm²/g) = f_2 (e/atom) \times 1.76787E+05

24 edges. Edge energies (keV):

K		1.15606E+02	L	I	2.17574E+00	L	II	2.09476E+00	L	III	1.71663E+01
M	I	5.54800E+00	M	II	5.18220E+00	M	III	4.30340E+00	M	IV	3.72760E+00
M	V	3.55170E+00	N	I	1.44080E+00	N	II	1.27260E+00	N	III	1.04490E+00
N	IV	7.80400E-00	N	V	7.37700E-00	N	VI	3.91300E-00	N	VII	3.80900E-01
O	I	3.23700E-00	O	II	2.59300E-00	O	III	1.95100E-00	O	IV	1.05000E-01
O	V	9.63000E-02	P	I	7.07000E-02	P	II	4.23000E-02	P	III	3.23000E-02

Relativistic correction estimate f_{rel} (H82,3/5CL) = -2.5771E+00, -1.4940E+00 e/atom

Nuclear Thomson correction f_{NT} = -1.9507E-02 e/atom

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$-\sigma$ (coh+inc) cm ² /g	μ_k cm ² /g	λ nm
1.069000E-02	2.79528E+01	0.0000E+00	0.0000E+00	1.2189E-04	0.000E+00	1.160E+02
1.142761E-02	2.79240E+01	0.0000E+00	0.0000E+00	1.6843E-04	0.000E+00	1.085E+02
1.221612E-02	2.78903E+01	0.0000E+00	0.0000E+00	2.3151E-04	0.000E+00	1.015E+02
1.305903E-02	2.78510E+01	0.0000E+00	0.0000E+00	3.1653E-04	0.000E+00	9.494E+01
1.396010E-02	2.78047E+01	0.0000E+00	0.0000E+00	4.3048E-04	0.000E+00	8.881E+01
1.492335E-02	2.77500E+01	0.0000E+00	0.0000E+00	5.8239E-04	0.000E+00	8.308E+01
1.595306E-02	2.76850E+01	0.0000E+00	0.0000E+00	7.8379E-04	0.000E+00	7.772E+01
1.705382E-02	2.76071E+01	0.0000E+00	0.0000E+00	1.0494E-03	0.000E+00	7.270E+01
1.823053E-02	2.75129E+01	0.0000E+00	0.0000E+00	1.3977E-03	0.000E+00	6.801E+01
1.948844E-02	2.73977E+01	0.0000E+00	0.0000E+00	1.8522E-03	0.000E+00	6.362E+01
2.083314E-02	2.72543E+01	0.0000E+00	0.0000E+00	2.4419E-03	0.000E+00	5.951E+01
2.227063E-02	2.70722E+01	0.0000E+00	0.0000E+00	3.2031E-03	0.000E+00	5.567E+01
2.380730E-02	2.68339E+01	0.0000E+00	0.0000E+00	4.1805E-03	0.000E+00	5.208E+01
2.545001E-02	2.65079E+01	0.0000E+00	0.0000E+00	5.4288E-03	0.000E+00	4.872E+01
2.720606E-02	2.60290E+01	0.0000E+00	0.0000E+00	7.0149E-03	0.000E+00	4.557E+01
2.908327E-02	2.52244E+01	0.0000E+00	0.0000E+00	9.0196E-03	0.000E+00	4.263E+01
3.109002E-02	2.32943E+01	0.0000E+00	0.0000E+00	1.1540E-02	0.000E+00	3.988E+01
3.165400E-02	2.19218E+01	0.0000E+00	0.0000E+00	1.2322E-02	0.000E+00	3.917E+01
3.213850E-02	1.86305E+01	0.0000E+00	0.0000E+00	1.3021E-02	0.000E+00	3.858E+01
3.226770E-02	1.45636E+01	0.0000E+00	0.0000E+00	1.3211E-02	0.000E+00	3.842E+01
3.246150E-02	1.90028E+01	8.0655E+00	4.3925E+04	1.3500E-02	0.000E+00	3.819E+01
3.294600E-02	2.29015E+01	7.6492E+00	4.1045E+04	1.4240E-02	0.000E+00	3.763E+01
3.323523E-02	2.39626E+01	7.4137E+00	3.9435E+04	1.4694E-02	0.000E+00	3.731E+01
3.552846E-02	2.72256E+01	5.8396E+00	2.9057E+04	1.8618E-02	0.000E+00	3.490E+01
3.797993E-02	2.80338E+01	4.5971E+00	2.1398E+04	2.3477E-02	0.000E+00	3.264E+01
4.060054E-02	2.75227E+01	3.6227E+00	1.5774E+04	2.9463E-02	0.000E+00	3.054E+01
4.145400E-02	2.67247E+01	3.3657E+00	1.4353E+04	3.1594E-02	0.000E+00	2.991E+01
4.208850E-02	2.48339E+01	3.1905E+00	1.3401E+04	3.3237E-02	0.000E+00	2.946E+01
4.225770E-02	2.24394E+01	3.1459E+00	1.3161E+04	3.3684E-02	0.000E+00	2.934E+01
4.251150E-02	2.50834E+01	7.8564E+00	3.2671E+04	3.4361E-02	0.000E+00	2.916E+01
4.314600E-02	2.74314E+01	7.4619E+00	3.0575E+04	3.6088E-02	0.000E+00	2.874E+01
4.340198E-02	2.78951E+01	7.3103E+00	2.9776E+04	3.6800E-02	0.000E+00	2.857E+01
4.639671E-02	3.00844E+01	5.8073E+00	2.2128E+04	4.5746E-02	0.000E+00	2.672E+01
4.959809E-02	3.06978E+01	4.6607E+00	1.6612E+04	5.6600E-02	0.000E+00	2.500E+01
5.302035E-02	3.08446E+01	3.8042E+00	1.2684E+04	6.9704E-02	0.000E+00	2.338E+01
5.667876E-02	3.07720E+01	3.1486E+00	9.8209E+03	8.5445E-02	0.000E+00	2.187E+01
6.058959E-02	3.05638E+01	2.6360E+00	7.6913E+03	1.0426E-01	0.000E+00	2.046E+01
6.477028E-02	3.02417E+01	2.2277E+00	6.0804E+03	1.2664E-01	0.000E+00	1.914E+01
6.923942E-02	2.97524E+01	1.8973E+00	4.8442E+03	1.5312E-01	0.000E+00	1.791E+01
6.928600E-02	2.97454E+01	1.8943E+00	4.8333E+03	1.5341E-01	0.000E+00	1.789E+01
7.034650E-02	2.95268E+01	1.8280E+00	4.5940E+03	1.6008E-01	0.000E+00	1.762E+01
7.062930E-02	2.93570E+01	1.8110E+00	4.5331E+03	1.6189E-01	0.000E+00	1.755E+01
7.105350E-02	2.94678E+01	2.0657E+00	5.1396E+03	1.6461E-01	0.000E+00	1.745E+01
7.211400E-02	2.94897E+01	1.9896E+00	4.8775E+03	1.7153E-01	0.000E+00	1.719E+01
7.401695E-02	2.93537E+01	1.8640E+00	4.4521E+03	1.8430E-01	0.000E+00	1.675E+01
7.912411E-02	2.87159E+01	1.5845E+00	3.5403E+03	2.2085E-01	0.000E+00	1.567E+01
8.458368E-02	2.76572E+01	1.3608E+00	2.8442E+03	2.6347E-01	0.000E+00	1.466E+01
9.041995E-02	2.56551E+01	1.1805E+00	2.3080E+03	3.1292E-01	0.000E+00	1.371E+01
9.437400E-02	2.23349E+01	1.0826E+00	2.0280E+03	3.4862E-01	0.000E+00	1.314E+01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_{κ} cm ² /g	λ nm
9.581850E-02	1.81716E+01	1.0507E+00	1.9385E+03	3.6209E-01	0.000E+00	1.294E+01
9.620370E-02	1.32881E+01	1.0425E+00	1.9157E+03	3.6572E-01	0.000E+00	1.289E+01
9.665893E-02	1.74096E+01	1.0594E+01	1.9377E+04	3.7004E-01	0.000E+00	1.283E+01
9.678150E-02	1.83211E+01	1.0566E+01	1.9300E+04	3.7120E-01	0.000E+00	1.281E+01
9.822600E-02	2.25593E+01	1.0235E+01	1.8422E+04	3.8504E-01	0.000E+00	1.262E+01
1.029000E-01	2.48399E+01	9.2675E+00	1.5922E+04	4.3132E-01	0.000E+00	1.205E+01
1.033284E-01	2.46539E+01	9.1858E+00	1.5716E+04	4.3567E-01	0.000E+00	1.200E+01
1.044750E-01	2.30502E+01	8.9723E+00	1.5182E+04	4.4741E-01	0.000E+00	1.187E+01
1.048950E-01	2.01569E+01	8.8960E+00	1.4993E+04	4.5174E-01	0.000E+00	1.182E+01
1.055250E-01	2.36270E+01	1.4841E+01	2.4864E+04	4.5827E-01	0.000E+00	1.175E+01
1.071000E-01	2.70271E+01	1.4433E+01	2.3825E+04	4.7477E-01	0.000E+00	1.158E+01
1.104581E-01	3.00483E+01	1.3559E+01	2.1701E+04	5.1073E-01	0.000E+00	1.122E+01
1.180797E-01	3.34113E+01	1.1642E+01	1.7431E+04	5.9616E-01	0.000E+00	1.050E+01
1.262272E-01	3.52065E+01	9.6348E+00	1.3494E+04	6.9291E-01	0.000E+00	9.822E+00
1.349368E-01	3.60127E+01	7.7566E+00	1.0162E+04	8.0197E-01	0.000E+00	9.188E+00
1.442475E-01	3.61795E+01	6.1725E+00	7.5649E+03	9.2430E-01	0.000E+00	8.595E+00
1.542005E-01	3.59585E+01	4.9189E+00	5.6393E+03	1.0609E+00	0.000E+00	8.040E+00
1.648404E-01	3.55078E+01	3.9643E+00	4.2516E+03	1.2126E+00	0.000E+00	7.521E+00
1.762144E-01	3.48996E+01	3.2536E+00	3.2641E+03	1.3803E+00	0.000E+00	7.036E+00
1.883732E-01	3.40579E+01	2.7311E+00	2.5631E+03	1.5648E+00	0.000E+00	6.582E+00
1.911980E-01	3.37615E+01	2.6353E+00	2.4366E+03	1.6083E+00	0.000E+00	6.485E+00
1.941245E-01	3.31784E+01	2.5442E+00	2.3169E+03	1.6536E+00	0.000E+00	6.387E+00
1.949049E-01	3.26034E+01	2.5212E+00	2.2868E+03	1.6658E+00	0.000E+00	6.361E+00
1.960755E-01	3.31077E+01	3.5505E+00	3.2012E+03	1.6840E+00	0.000E+00	6.323E+00
1.990020E-01	3.34659E+01	3.4612E+00	3.0748E+03	1.7297E+00	0.000E+00	6.230E+00
2.013709E-01	3.35341E+01	3.3938E+00	2.9795E+03	1.7668E+00	0.000E+00	6.157E+00
2.152655E-01	3.33723E+01	3.0715E+00	2.5225E+03	1.9869E+00	0.000E+00	5.760E+00
2.301188E-01	3.29363E+01	2.8345E+00	2.1776E+03	2.2256E+00	0.000E+00	5.388E+00
2.459970E-01	3.23325E+01	2.6663E+00	1.9161E+03	2.4830E+00	0.000E+00	5.040E+00
2.541140E-01	3.19033E+01	2.6041E+00	1.8117E+03	2.6151E+00	0.000E+00	4.879E+00
2.580035E-01	3.15076E+01	2.5788E+00	1.7670E+03	2.6785E+00	0.000E+00	4.806E+00
2.590407E-01	3.11474E+01	2.5725E+00	1.7556E+03	2.6954E+00	0.000E+00	4.786E+00
2.605965E-01	3.14447E+01	3.2065E+00	2.1753E+03	2.7207E+00	0.000E+00	4.758E+00
2.629708E-01	3.15923E+01	3.1757E+00	2.1349E+03	2.7594E+00	0.000E+00	4.715E+00
2.644860E-01	3.16172E+01	3.1568E+00	2.1100E+03	2.7841E+00	0.000E+00	4.688E+00
2.811158E-01	3.13188E+01	2.9841E+00	1.8766E+03	3.0547E+00	0.000E+00	4.410E+00
3.005128E-01	3.06073E+01	2.8491E+00	1.6761E+03	3.3685E+00	0.000E+00	4.126E+00
3.172260E-01	2.97959E+01	2.7776E+00	1.5479E+03	3.6364E+00	0.000E+00	3.908E+00
3.212482E-01	2.95385E+01	2.7650E+00	1.5216E+03	3.7004E+00	0.000E+00	3.859E+00
3.220815E-01	2.94695E+01	2.7626E+00	1.5163E+03	3.7137E+00	0.000E+00	3.849E+00
3.233763E-01	2.92950E+01	2.7589E+00	1.5083E+03	3.7342E+00	0.000E+00	3.834E+00
3.253185E-01	2.93089E+01	2.9706E+00	1.6143E+03	3.7650E+00	0.000E+00	3.811E+00
3.301740E-01	2.91549E+01	2.9605E+00	1.5852E+03	3.8418E+00	0.000E+00	3.755E+00
3.434143E-01	2.84880E+01	2.9416E+00	1.5143E+03	4.0496E+00	0.000E+00	3.610E+00
3.671099E-01	2.68836E+01	2.9316E+00	1.4118E+03	4.4151E+00	0.000E+00	3.377E+00
3.732820E-01	2.63425E+01	2.9328E+00	1.3890E+03	4.5088E+00	0.000E+00	3.321E+00
3.789955E-01	2.57157E+01	2.9349E+00	1.3690E+03	4.5950E+00	0.000E+00	3.271E+00
3.805191E-01	2.54349E+01	2.9356E+00	1.3639E+03	4.6179E+00	0.000E+00	3.258E+00
3.828045E-01	2.53129E+01	3.2026E+00	1.4790E+03	4.6521E+00	0.000E+00	3.239E+00
3.834740E-01	2.52644E+01	3.2108E+00	1.4802E+03	4.6622E+00	0.000E+00	3.233E+00
3.885180E-01	2.47687E+01	3.2810E+00	1.4929E+03	4.7374E+00	0.000E+00	3.191E+00
3.893435E-01	2.46666E+01	3.2939E+00	1.4956E+03	4.7497E+00	0.000E+00	3.184E+00
3.909087E-01	2.44069E+01	3.3195E+00	1.5012E+03	4.7729E+00	0.000E+00	3.172E+00
3.924405E-01	2.43091E+01	3.5522E+00	1.6002E+03	4.7956E+00	0.000E+00	3.159E+00
3.932565E-01	2.42563E+01	3.5743E+00	1.6068E+03	4.8077E+00	0.000E+00	3.153E+00
3.991260E-01	2.37060E+01	3.7559E+00	1.6636E+03	4.8941E+00	0.000E+00	3.106E+00
4.195189E-01	2.13041E+01	4.8226E+00	2.0323E+03	5.1896E+00	0.000E+00	2.955E+00
4.484657E-01	1.77332E+01	7.9788E+00	3.1453E+03	5.5954E+00	0.000E+00	2.765E+00
4.794098E-01	1.50367E+01	1.3269E+01	4.8930E+03	6.0111E+00	0.000E+00	2.586E+00
5.124891E-01	1.44442E+01	2.0027E+01	6.9085E+03	6.4343E+00	0.000E+00	2.419E+00
5.478508E-01	1.64762E+01	2.6903E+01	8.6814E+03	6.8627E+00	0.000E+00	2.263E+00
5.856525E-01	2.07109E+01	3.2585E+01	9.8363E+03	7.2936E+00	0.000E+00	2.117E+00
6.260625E-01	2.61225E+01	3.6340E+01	1.0262E+04	7.7245E+00	0.000E+00	1.980E+00
6.692609E-01	3.15630E+01	3.8080E+01	1.0059E+04	8.1523E+00	0.000E+00	1.853E+00
7.154399E-01	3.56536E+01	3.8143E+01	9.4251E+03	8.5741E+00	0.000E+00	1.733E+00

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 639

TABLE 1: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
7.229460E-01	3.59117E+01	3.8032E+01	9.3003E+03	8.6393E+00	0.000E+00	1.715E+00
7.340115E-01	3.52859E+01	3.7824E+01	9.1100E+03	8.7339E+00	0.000E+00	1.689E+00
7.369623E-01	3.36416E+01	3.7760E+01	9.0582E+03	8.7587E+00	0.000E+00	1.682E+00
7.413885E-01	3.58717E+01	4.1359E+01	9.8621E+03	8.7958E+00	0.000E+00	1.672E+00
7.524540E-01	3.83022E+01	4.1135E+01	9.6645E+03	8.8872E+00	0.000E+00	1.648E+00
7.648052E-01	3.97072E+01	4.0844E+01	9.4411E+03	8.9869E+00	0.000E+00	1.621E+00
7.764980E-01	4.01205E+01	4.0535E+01	9.2286E+03	9.0792E+00	0.000E+00	1.597E+00
7.796196E-01	3.93107E+01	4.0447E+01	9.1719E+03	9.1035E+00	0.000E+00	1.590E+00
7.843020E-01	4.09476E+01	4.2572E+01	9.5959E+03	9.1397E+00	0.000E+00	1.581E+00
7.960080E-01	4.30958E+01	4.2262E+01	9.3861E+03	9.2287E+00	0.000E+00	1.558E+00
8.175768E-01	4.56281E+01	4.1650E+01	9.0061E+03	9.3877E+00	0.000E+00	1.516E+00
8.739896E-01	5.03000E+01	3.9885E+01	8.0677E+03	9.7734E+00	0.000E+00	1.419E+00
9.342948E-01	5.37743E+01	3.7929E+01	7.1770E+03	1.0141E+01	0.000E+00	1.327E+00
9.987612E-01	5.62746E+01	3.5952E+01	6.3638E+03	1.0488E+01	0.000E+00	1.241E+00
1.024002E+00	5.67617E+01	3.5157E+01	6.0696E+03	1.0612E+01	0.000E+00	1.211E+00
1.039675E+00	5.63907E+01	3.4673E+01	5.8958E+03	1.0686E+01	0.000E+00	1.193E+00
1.043855E+00	5.54427E+01	3.4545E+01	5.8506E+03	1.0705E+01	0.000E+00	1.188E+00
1.050124E+00	5.67055E+01	3.6492E+01	6.1434E+03	1.0733E+01	0.000E+00	1.181E+00
1.065798E+00	5.81523E+01	3.6075E+01	5.9838E+03	1.0803E+01	0.000E+00	1.163E+00
1.067676E+00	5.82710E+01	3.6026E+01	5.9651E+03	1.0811E+01	0.000E+00	1.161E+00
1.141345E+00	6.14510E+01	3.4109E+01	5.2833E+03	1.1109E+01	0.000E+00	1.086E+00
1.220098E+00	6.37054E+01	3.2167E+01	4.6609E+03	1.1378E+01	0.000E+00	1.016E+00
1.247148E+00	6.42924E+01	3.1543E+01	4.4713E+03	1.1460E+01	0.000E+00	9.941E-01
1.266237E+00	6.45437E+01	3.1076E+01	4.3387E+03	1.1514E+01	0.000E+00	9.792E-01
1.271327E+00	6.44228E+01	3.0953E+01	4.3043E+03	1.1529E+01	0.000E+00	9.752E-01
1.278963E+00	6.48365E+01	3.1232E+01	4.3171E+03	1.1550E+01	0.000E+00	9.694E-01
1.298052E+00	6.54451E+01	3.0775E+01	4.1913E+03	1.1600E+01	0.000E+00	9.552E-01
1.304285E+00	6.56027E+01	3.0628E+01	4.1514E+03	1.1616E+01	0.000E+00	9.506E-01
1.394281E+00	6.72306E+01	2.8569E+01	3.6224E+03	1.1823E+01	0.000E+00	8.892E-01
1.411984E+00	6.74332E+01	2.8194E+01	3.5300E+03	1.1858E+01	0.000E+00	8.781E-01
1.433596E+00	6.75238E+01	2.7750E+01	3.4221E+03	1.1899E+01	0.000E+00	8.648E-01
1.439359E+00	6.73356E+01	2.7634E+01	3.3941E+03	1.1909E+01	0.000E+00	8.614E-01
1.448004E+00	6.77376E+01	2.7992E+01	3.4175E+03	1.1925E+01	0.000E+00	8.562E-01
1.469616E+00	6.82637E+01	2.7573E+01	3.3169E+03	1.1962E+01	0.000E+00	8.437E-01
1.490486E+00	6.86245E+01	2.7181E+01	3.2240E+03	1.1995E+01	0.000E+00	8.318E-01
1.593329E+00	6.99370E+01	2.5229E+01	2.7993E+03	1.2133E+01	0.000E+00	7.781E-01
1.703269E+00	7.08029E+01	2.3293E+01	2.4177E+03	1.2235E+01	0.000E+00	7.279E-01
1.820795E+00	7.13695E+01	2.1544E+01	2.0918E+03	1.2301E+01	0.000E+00	6.809E-01
1.946430E+00	7.17207E+01	1.9946E+01	1.8116E+03	1.2330E+01	0.000E+00	6.370E-01
2.080733E+00	7.18915E+01	1.8490E+01	1.5709E+03	1.2323E+01	0.000E+00	5.959E-01
2.224304E+00	7.19718E+01	1.7142E+01	1.3624E+03	1.2279E+01	0.000E+00	5.574E-01
2.377781E+00	7.18121E+01	1.5922E+01	1.1838E+03	1.2201E+01	0.000E+00	5.214E-01
2.541848E+00	7.14495E+01	1.4819E+01	1.0307E+03	1.2089E+01	0.000E+00	4.878E-01
2.717235E+00	7.08654E+01	1.3811E+01	8.9857E+02	1.1943E+01	0.000E+00	4.563E-01
2.904724E+00	6.99412E+01	1.2896E+01	7.8488E+02	1.1767E+01	0.000E+00	4.268E-01
3.105150E+00	6.86251E+01	1.1834E+01	6.7378E+02	1.1561E+01	0.000E+00	3.993E-01
3.319406E+00	6.54390E+01	1.0677E+01	5.6862E+02	1.1328E+01	0.000E+00	3.735E-01
3.480666E+00	5.97039E+01	9.9352E+00	5.0462E+02	1.1147E+01	0.000E+00	3.562E-01
3.533942E+00	5.38613E+01	9.7113E+00	4.8581E+02	1.1086E+01	0.000E+00	3.508E-01
3.548445E+00	4.74966E+01	9.6521E+00	4.8087E+02	1.1070E+01	0.000E+00	3.494E-01
3.569459E+00	5.26347E+01	2.0892E+01	1.0347E+03	1.1046E+01	0.000E+00	3.473E-01
3.622734E+00	5.61730E+01	2.1494E+01	1.0489E+03	1.0985E+01	0.000E+00	3.422E-01
3.653048E+00	5.65213E+01	2.1860E+01	1.0579E+03	1.0950E+01	0.000E+00	3.394E-01
3.708962E+00	5.46240E+01	2.2581E+01	1.0763E+03	1.0886E+01	0.000E+00	3.343E-01
3.723872E+00	5.07198E+01	2.2783E+01	1.0816E+03	1.0868E+01	0.000E+00	3.329E-01
3.746238E+00	5.57172E+01	3.1484E+01	1.4858E+03	1.0843E+01	0.000E+00	3.310E-01
3.793288E+00	6.05481E+01	3.1609E+01	1.4731E+03	1.0788E+01	0.000E+00	3.269E-01
3.802152E+00	6.11356E+01	3.1623E+01	1.4703E+03	1.0778E+01	0.000E+00	3.261E-01
4.055024E+00	7.07049E+01	3.0305E+01	1.3212E+03	1.0487E+01	0.000E+00	3.058E-01
4.217332E+00	7.30339E+01	2.8336E+01	1.1878E+03	1.0301E+01	0.000E+00	2.940E-01
4.281883E+00	7.22360E+01	2.7486E+01	1.1348E+03	1.0227E+01	0.000E+00	2.896E-01
4.299097E+00	7.02440E+01	2.7258E+01	1.1209E+03	1.0208E+01	0.000E+00	2.884E-01
4.324917E+00	7.28482E+01	3.1346E+01	1.2813E+03	1.0178E+01	0.000E+00	2.867E-01
4.334821E+00	7.35305E+01	3.1209E+01	1.2728E+03	1.0167E+01	0.000E+00	2.860E-01
4.389468E+00	7.56949E+01	3.0458E+01	1.2267E+03	1.0105E+01	0.000E+00	2.825E-01

TABLE 1: Form factors, attenuation and scattering cross-sections, $Z = 1-92$, from $E = 0.001-0.010$ keV to $E = 400-1000$ keV — Continued.

E keV	f_1 e/atom	f_2 e/atom	μ cm ² /g	$\sigma(\text{coh+inc})$ cm ² /g	μ_k cm ² /g	λ nm
4.633924E+00	7.97420E+01	2.7299E+01	1.0415E+03	9.8318E+00	0.000E+00	2.676E-01
4.953664E+00	8.17842E+01	2.4172E+01	8.6265E+02	9.4836E+00	0.000E+00	2.503E-01
5.078556E+00	8.20216E+01	2.3162E+01	8.0629E+02	9.3509E+00	0.000E+00	2.441E-01
5.156289E+00	8.16845E+01	2.2579E+01	7.7413E+02	9.2692E+00	0.000E+00	2.405E-01
5.177018E+00	8.10069E+01	2.2429E+01	7.6590E+02	9.2476E+00	0.000E+00	2.395E-01
5.20811E+00	8.18451E+01	2.3676E+01	8.0366E+02	9.2152E+00	0.000E+00	2.381E-01
5.285844E+00	8.27243E+01	2.3136E+01	7.7379E+02	9.1349E+00	0.000E+00	2.346E-01
5.295467E+00	8.27906E+01	2.3071E+01	7.7022E+02	9.1250E+00	0.000E+00	2.341E-01
5.437040E+00	8.34056E+01	2.2163E+01	7.2065E+02	8.9808E+00	0.000E+00	2.280E-01
5.520260E+00	8.33692E+01	2.1668E+01	6.9392E+02	8.8973E+00	0.000E+00	2.246E-01
5.542452E+00	8.29745E+01	2.1539E+01	6.8704E+02	8.8752E+00	0.000E+00	2.237E-01
5.575740E+00	8.35910E+01	2.2303E+01	7.0714E+02	8.8422E+00	0.000E+00	2.224E-01
5.660855E+00	8.43339E+01	2.1828E+01	6.8168E+02	8.7583E+00	0.000E+00	2.190E-01
6.051453E+00	8.58919E+01	1.9892E+01	5.8112E+02	8.3860E+00	0.000E+00	2.049E-01
6.469004E+00	8.68845E+01	1.8160E+01	4.9629E+02	8.0104E+00	0.000E+00	1.917E-01
6.915365E+00	8.76315E+01	1.6578E+01	4.2379E+02	7.6336E+00	0.000E+00	1.793E-01
7.392525E+00	8.83400E+01	1.5073E+01	3.6045E+02	7.2576E+00	0.000E+00	1.677E-01
7.902609E+00	8.88088E+01	1.3659E+01	3.0556E+02	6.8845E+00	0.000E+00	1.569E-01
8.447890E+00	8.90434E+01	1.2396E+01	2.5940E+02	6.5159E+00	0.000E+00	1.468E-01
9.030794E+00	8.93244E+01	1.1217E+01	2.1958E+02	6.1535E+00	0.000E+00	1.373E-01
9.653919E+00	8.93484E+01	1.0035E+01	1.8377E+02	5.7987E+00	0.000E+00	1.284E-01
1.032004E+01	8.92472E+01	8.9963E+00	1.5411E+02	5.4528E+00	0.000E+00	1.201E-01
1.103212E+01	8.91021E+01	8.0616E+00	1.2918E+02	5.1169E+00	0.000E+00	1.124E-01
1.179334E+01	8.88563E+01	7.2272E+00	1.0834E+02	4.7919E+00	0.000E+00	1.051E-01
1.260708E+01	8.85144E+01	6.4889E+00	9.0992E+01	4.4786E+00	0.000E+00	9.834E-02
1.347697E+01	8.80793E+01	5.8352E+00	7.6545E+01	4.1777E+00	0.000E+00	9.200E-02
1.440688E+01	8.75056E+01	5.2532E+00	6.4461E+01	3.8897E+00	0.000E+00	8.606E-02
1.540095E+01	8.66632E+01	4.7330E+00	5.4329E+01	3.6149E+00	0.000E+00	8.050E-02
1.646362E+01	8.49904E+01	4.2573E+00	4.5715E+01	3.3534E+00	0.000E+00	7.531E-02
1.682297E+01	8.37020E+01	4.1139E+00	4.3232E+01	3.2717E+00	0.000E+00	7.370E-02
1.708047E+01	8.1840E+01	4.0165E+00	4.1572E+01	3.2151E+00	0.000E+00	7.259E-02
1.714913E+01	7.82159E+01	3.9912E+00	4.1145E+01	3.2003E+00	0.000E+00	7.230E-02
1.725213E+01	8.11816E+01	9.7676E+00	1.0009E+02	3.1782E+00	0.000E+00	7.187E-02
1.750963E+01	8.38201E+01	9.5374E+00	9.6295E+01	3.1241E+00	0.000E+00	7.081E-02
1.759961E+01	8.42601E+01	9.4591E+00	9.5016E+01	3.1055E+00	0.000E+00	7.045E-02
1.881398E+01	8.65214E+01	8.4719E+00	7.9607E+01	2.8712E+00	0.000E+00	6.590E-02
2.011215E+01	8.66430E+01	7.5551E+00	6.6409E+01	2.6502E+00	0.000E+00	6.165E-02
2.052865E+01	8.61569E+01	7.2931E+00	6.2806E+01	2.5850E+00	0.000E+00	6.040E-02
2.084286E+01	8.49264E+01	7.1048E+00	6.0262E+01	2.5375E+00	0.000E+00	5.949E-02
2.092665E+01	8.34187E+01	7.0559E+00	5.9608E+01	2.5251E+00	0.000E+00	5.925E-02
2.105234E+01	8.49155E+01	9.9432E+00	8.3498E+01	2.5066E+00	0.000E+00	5.889E-02
2.132225E+01	8.60676E+01	9.7423E+00	8.0775E+01	2.4677E+00	0.000E+00	5.815E-02
2.136655E+01	8.61487E+01	9.7100E+00	8.0340E+01	2.4614E+00	0.000E+00	5.803E-02
2.149988E+01	8.62893E+01	9.6138E+00	7.9051E+01	2.4425E+00	0.000E+00	5.767E-02
2.164861E+01	8.61911E+01	9.5083E+00	7.7647E+01	2.4218E+00	0.000E+00	5.727E-02
2.173564E+01	8.55954E+01	9.4475E+00	7.6841E+01	2.4098E+00	0.000E+00	5.704E-02
2.186619E+01	8.65378E+01	1.0820E+01	8.7479E+01	2.3920E+00	0.000E+00	5.670E-02
2.219255E+01	8.76176E+01	1.0587E+01	8.4333E+01	2.3484E+00	0.000E+00	5.587E-02
2.298338E+01	8.88440E+01	1.0043E+01	7.7249E+01	2.2478E+00	0.000E+00	5.395E-02
2.456923E+01	9.01206E+01	9.0627E+00	6.5211E+01	2.0657E+00	0.000E+00	5.046E-02
2.626450E+01	9.08923E+01	8.1770E+00	5.5040E+01	1.8959E+00	0.000E+00	4.721E-02
2.807676E+01	9.14167E+01	7.3433E+00	4.6237E+01	1.7379E+00	0.000E+00	4.416E-02
3.001405E+01	9.17506E+01	6.5760E+00	3.8734E+01	1.5913E+00	0.000E+00	4.131E-02
3.208502E+01	9.19635E+01	5.8930E+00	3.2470E+01	1.4555E+00	0.000E+00	3.864E-02
3.429889E+01	9.20978E+01	5.2854E+00	2.7242E+01	1.3301E+00	0.000E+00	3.615E-02
3.666551E+01	9.22294E+01	4.7300E+00	2.2806E+01	1.2145E+00	0.000E+00	3.381E-02
3.919543E+01	9.22566E+01	4.2372E+00	1.9111E+01	1.1081E+00	0.000E+00	3.163E-02
4.189992E+01	9.22905E+01	3.7996E+00	1.6032E+01	1.0105E+00	0.000E+00	2.959E-02
4.479101E+01	9.22915E+01	3.3967E+00	1.3407E+01	9.2107E-01	0.000E+00	2.768E-02
4.788159E+01	9.22438E+01	3.0332E+00	1.1199E+01	8.3931E-01	0.000E+00	2.589E-02
5.118542E+01	9.21798E+01	2.7107E+00	9.3624E+00	7.646E-01	0.000E+00	2.422E-02
5.471721E+01	9.21051E+01	2.4243E+00	7.8328E+00	6.9670E-01	0.000E+00	2.266E-02
5.849270E+01	9.20229E+01	2.1699E+00	6.5581E+00	6.3488E-01	0.000E+00	2.120E-02
6.252870E+01	9.19351E+01	1.9436E+00	5.4951E+00	5.7874E-01	0.000E+00	1.983E-02
6.684318E+01	9.18426E+01	1.7422E+00	4.6078E+00	5.2784E-01	0.000E+00	1.855E-02

THEORETICAL FORM FACTOR, ATTENUATION, AND SCATTERING TABULATION FOR Z = 1-92 641

TABLE I: Form factors, attenuation and scattering cross-sections, Z = 1-92, from E = 0.001-0.010 keV to E = 400-1000 keV — Continued.

E keV	f ₁ e/atom	f ₂ e/atom	μ cm ² /g	σ(coh+inc) cm ² /g	μ _K cm ² /g	λ nm
7.145536E+01	9.17453E+01	1.5628E+00	3.8666E+00	4.8176E-01	0.000E+00	1.735E-02
7.638578E+01	9.16425E+01	1.4021E+00	3.2449E+00	4.4010E-01	0.000E+00	1.623E-02
8.165640E+01	9.15374E+01	1.2542E+00	2.7155E+00	4.0248E-01	0.000E+00	1.518E-02
8.729069E+01	9.14048E+01	1.1164E+00	2.2610E+00	3.6854E-01	0.000E+00	1.420E-02
9.331374E+01	9.12401E+01	9.9385E-01	1.8829E+00	3.3795E-01	0.000E+00	1.329E-02
9.975239E+01	9.10167E+01	8.8245E-01	1.5639E+00	3.1041E-01	0.000E+00	1.243E-02
1.066353E+02	9.06512E+01	7.8376E-01	1.2994E+00	2.8562E-01	0.000E+00	1.163E-02
1.132940E+02	8.97540E+01	7.0418E-01	1.0988E+00	2.6528E-01	0.000E+00	1.094E-02
1.139931E+02	8.95066E+01	6.9658E-01	1.0803E+00	2.6332E-01	0.000E+00	1.088E-02
1.150281E+02	8.87858E+01	6.8558E-01	1.0537E+00	2.6048E-01	0.000E+00	1.078E-02
1.154905E+02	8.76284E+01	6.8076E-01	1.0421E+00	2.5923E-01	0.000E+00	1.074E-02
1.161841E+02	8.88339E+01	2.9507E+00	4.4898E+00	2.5738E-01	3.465E+00	1.067E-02
1.179182E+02	8.98873E+01	2.8843E+00	4.3242E+00	2.5288E-01	3.340E+00	1.051E-02
1.218587E+02	9.06637E+01	2.7419E+00	3.9778E+00	2.4327E-01	3.079E+00	1.017E-02
1.302669E+02	9.13182E+01	2.4727E+00	3.3558E+00	2.2525E-01	2.607E+00	9.518E-03
1.392553E+02	9.16332E+01	2.2281E+00	2.8286E+00	2.0904E-01	2.205E+00	8.903E-03
1.488640E+02	9.18604E+01	2.0069E+00	2.3833E+00	1.9446E-01	1.864E+00	8.329E-03
1.591356E+02	9.19976E+01	1.8075E+00	2.0080E+00	1.8133E-01	1.574E+00	7.791E-03
1.701159E+02	9.20914E+01	1.6270E+00	1.6908E+00	1.6951E-01	1.329E+00	7.288E-03
1.818539E+02	9.21545E+01	1.4640E+00	1.4232E+00	1.5885E-01	1.121E+00	6.818E-03
1.944018E+02	9.21962E+01	1.3174E+00	1.1980E+00	1.4922E-01	9.454E-01	6.378E-03
2.078156E+02	9.22226E+01	1.1856E+00	1.0085E+00	1.4051E-01	7.973E-01	5.966E-03
2.221548E+02	9.22378E+01	1.0670E+00	8.4913E-01	1.3262E-01	6.724E-01	5.581E-03
2.374835E+02	9.22446E+01	9.6050E-01	7.1501E-01	1.2545E-01	5.670E-01	5.221E-03
2.538699E+02	9.22454E+01	8.6554E-01	6.0273E-01	1.1891E-01	4.788E-01	4.884E-03
2.713869E+02	9.22423E+01	7.8024E-01	5.0826E-01	1.1295E-01	4.044E-01	4.569E-03
2.901126E+02	9.22362E+01	7.0343E-01	4.2865E-01	1.0749E-01	3.415E-01	4.274E-03
3.101304E+02	9.22281E+01	6.3425E-01	3.6155E-01	1.0247E-01	2.884E-01	3.998E-03
3.315294E+02	9.22184E+01	5.7194E-01	3.0499E-01	9.7836E-02	2.436E-01	3.740E-03
3.544049E+02	9.22078E+01	5.1581E-01	2.5730E-01	9.3550E-02	2.058E-01	3.498E-03
3.788588E+02	9.21966E+01	4.6523E-01	2.1709E-01	8.9570E-02	1.738E-01	3.273E-03
4.050001E+02	9.21851E+01	4.1966E-01	1.8318E-01	8.5860E-02	1.468E-01	3.061E-03
4.329451E+02	9.21736E+01	3.7858E-01	1.5459E-01	8.2388E-02	1.240E-01	2.864E-03

