Doppler Broadening Calculations of Compton Scattering for Molecules, Plastics, Tissues, and Few Biological Materials in the X-Ray Region: An Analysis in Terms of Compton Broadening and Geometrical Energy Broadening

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Relativistic and nonrelativistic Compton profile cross sections for H, C, N, O, P, and Ca and for a few important biological materials such as water, polyethylene, lucite, polystyrene, nylon, polycarbonate, bakelite, fat, bone and calcium hydroxyapatite are estimated for a number of $K\alpha$ x-ray energies and for 59.54 keV (Am-241) γ photons. Energy broadening and geometrical broadening (ΔG) is estimated by assuming $\theta_{\min}$ and $\theta_{\max}$ are symmetrically situated around $\theta = 90°$. FWHM of $J(P_Z)$ and FWHM of Compton energy broadening are evaluated at various incident photon energies. These values are estimated around the centroid of the Compton profile with an energy interval of 0.1 and 1.0 keV for 59.54 keV photons. Total Compton, individual shell, and Compton energy–absorption scattering cross sections are evaluated in the energy region from 0.005 to 0.5 MeV. It is an attempt to know the effect of Doppler broadening for single atoms, many of which constitute the biological materials. © *2004 American Institute of Physics.* [DOI: 10.1063/1.1614814]

Key words: biological materials; Compton broadening; geometrical energy broadening, Compton energy absorption cross sections; Compton scatter tomography and imaging; Doppler broadening, relativistic and nonrelativistic Compton profile cross sections; total Compton and individual shell cross sections.

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1. Introduction

Incoherent (Compton) scattering is an important mode of interaction with atoms for photons in the energy region <2 MeV. Although the Klein–Nishina theory[1] gives a satisfactory explanation of this process over most of the energy region where it is predominant, the incoherent scattering cross-section is found to deviate from its predicted value for low photon energies. This can be understood in terms of the increasing influence of the bound electrons of the scattering medium. An attempt to quantify these deviations has been made under the impulse approximation with the introduction of the so-called incoherent scattering function $S(X,Z)$ as a multiplicative factor to the free electron differential cross section. Impulse approximation refers to large transfers of energy and momentum. However, if the electrons are in motion, as we know to be the case, there is a Doppler effect related to the projected velocities of the electrons. This causes the modified (Compton line) to spread out and become a bond. The electron momentum distribution can be determined from the spreading out of the Compton line.

The motion of the atomic electrons around the atomic nucleus gives rise to a Doppler broadening of the apparent energy of the incident photon, resulting in a corresponding broadening of the Compton ''modified line'' for a given deflection angle of the outgoing scattered photon. The shape of this broadened line is called the ''Compton profile.'' The shape of the profile is sensitive to the valencies of the electrons in the atoms and can also give some information about molecular structure.[2] Although it is used to determine the electron momentum distributions in condensed matter physics,[3] little attention is focused for its use in medical applications.

In dosimetry calculations, use is frequently made of the Compton energy absorption cross section per electron (σ_{en}), which expresses the probability of transfer of energy from a photon to an electron by the Compton process. It is equal to the total Compton scattering cross section per electron (σ_{TC}) times the fraction (f) of photon energy, which is converted to kinetic energy of the recoil electrons in a single collision, averaged over all directions of electron recoil ($\sigma_{en}=\sigma_{TC}\times f$). Since the range of the recoil electron is small, the Compton energy absorption cross section per electron is a measure of the total energy communicated locally to the absorbing medium by the Compton process. It is interesting to estimate these cross sections by means of double differential scattering cross sections based on impulse approximations. One particular area of interest is in Monte Carlo simulation of photon transport in applications of medical physics and industrial radiography.[4,5]

The Compton scattered photon energy is broadened by the precollision motion of the electron. Due to the Doppler broadening electron binding effect, a part of the broadened photon spectrum is suppressed and the image reconstruction will be tedious with Compton scattering spectral data. The electrons moving in the target cause an energy broadening of the scattered photons. At energies below 100 keV, FWHM

TABLE 1. X-ray source and energy[a]

X-ray source	Energy (keV)	X-ray source	Energy (keV)	X-ray source	Energy (keV)
Mo $K\alpha$	17.44	La $K\alpha$	33.36	Yb $K\alpha$	52.02
Ag $K\alpha$	22.10	Ce $K\alpha$	34.57	W $K\alpha$	58.83
Cd $K\alpha$	23.10	Pr $K\alpha$	35.86	Am-241	59.54
In $K\alpha$	24.10	Sm $K\alpha$	39.91	Pt $K\alpha$	66.24
Sn $K\alpha$	25.20	Gd $K\alpha$	42.76	Au $K\alpha$	68.18
Cs $K\alpha$	30.85	Dy $K\alpha$	45.72		
Ba $K\alpha$	32.06	Er $K\alpha$	48.81		

[a]$K\alpha$ = weighted average energy of $K\alpha 1$ and $K\alpha 2$.

of the broadening over most of the θ is greater than the FWHM resolution of Hp Ge detector resolutions.[6]

The most intense Compton scattering is produced by the first row elements in the periodic Table $1 \leqslant Z \leqslant 20$. The electron binding energies for those elements (for example carbon) are such that 75% or more of the incident x rays are scattered into the Compton peak for x-ray wavelengths $\leqslant 0.8$ Å^{-1} and for a 90° scattering angle.[7] Many biological and phantom materials of interest contain varying proportions of the elements in the atomic region $1 \leqslant Z \leqslant 20$. We have considered the quasimonoenergetic radiation for the present calculations in the energy region $17.44 \leqslant E \leqslant 68.18$ keV produced using an x-ray tube with secondary targets and γ rays emitted by Am-241 (59.54 keV). This radioisotope is widely employed in Compton scattering measurements because of its relatively long life. The energy interval 15–50 keV is not well covered by synchrotron radiation nor by radioactive sources, and further corresponds to the best conversion efficiency region of bremsstraglung radiation in quasi monoenergetic mode using an x-ray tube. The characteristic $K\alpha$ line energies of the secondary targets scattered elastically and inelastically by the sample will be detected using a semiconductor detector. This radiation will be used to study the scattering effects on various materials, with special attention to Rayleigh and Compton peaks separately. The choice of 90° geometry will be useful because of the clear voxel determination, in spite of the fact that the difference between Rayleigh and Compton peaks is about one of the difference at 180°.[8] The present energy range will also be useful for material characterization using Compton profile, for example, nondestructive evaluation.[9]

Total and individual shell scattering cross sections and Compton energy absorption scattering cross sections are evaluated in the energy region from 0.005 to 0.5 MeV. We will select the required photon energy within the region for molecules, plastics, tissues and biological materials, where the Compton scattering dominates the total attenuation coefficient (90%).

Compton profiles $J(p_z)$, calculated using Hartree–Fock wave functions are available in the literature.[10] The impact of the Compton profile on the computation of x-ray cross section and attenuation coefficients derived based on the data seems not have been explored fully in the literature. Further, to generate the tables of total, individual shell and Compton energy absorption cross sections by means of double differential scattering cross sections based on impulse approximation with the inclusion of Doppler broadening. These types of new tables are not available in the literature and will be useful for comparison, compilation, and simulation purposes for medical and biological applications.

2. Basic Theoretical Methods

The Compton's energy shift formula Eq. (1) was derived assuming stationary free electrons. It predicts for a given scatter angle θ, a well-defined value of energy of the scattered photon ω_2^c. Detecting the photons at one angle we should measure the same energy for all the photons. In reality, this is not the case. The peak of the energy spectrum of photons scattered at a given angle has an intrinsic width. The reason for the broadening is the initial state of electrons in the atom as a whole. Electrons are not free and not at rest. Each element broadens the energy distribution in its characteristic way. The net result is the breakdown of Eq. (1) due to its initial electron momentum

$$\omega_2^c = \omega_1[1+(\omega_1/m_0c^2)(1-\cos(\theta))]^{-1}. \tag{1}$$

If a monoenergetic primary photon beam is scattered through an angle (θ), the geometrical energy broadening takes place and the associated uncertainty is evaluated by differentiating Eq. (1) w.r.t. an angle (θ) and can be written as follows:

$$d\omega_2/d\theta = (\omega_1^2/m_0c^2)\sin\theta[1+(\omega_1/m_0c^2)(1-\cos(\theta))]^{-2}. \tag{2}$$

3. Theory: Compton Scattering from Bound Electrons

Using the total cross section for the scattering of a photon from a free electron, an approximate expression for scattering from bound electrons may be obtained and the derivation is mentioned below. First consider two monoenergetic colliding beams, one of relativistic electrons and the other of photons. For simplicity we used units $\hbar = 1$ and $c = 1$. The momenta and energies of the electrons before and after the collision are $(\mathbf{p},\mathbf{E})$ and $(\mathbf{p}',\mathbf{E}')$, respectively. The corresponding photon states are $(\mathbf{k},\omega_1)$ and $(\mathbf{k}',\omega_2)$. The total cross section is then the familiar expression[11]

$$\sigma = m^2 r_0^2 \int d^3k' d^3p' (1/2KE'\omega_2)\overline{X}(K,K') \times \delta(p+k-p'-k')\delta(E+\omega_1-E'-\omega_2) \tag{3}$$

where m is the rest mass of the electron, r_0 its classical radius, ω_1 and ω_2 are the incident and scattered photon energies

$$K = E\omega_1 - p.k, \tag{4}$$

$$K' = E\omega_2 - p.k' = K - \omega_1\omega_2(1-\cos\theta), \tag{5}$$

$$\overline{X}(K,K')=(K/K'+K'/K+2m^2(1/K-1/K')+m^4(1/K-1/K')^2, \quad (6)$$

where θ is the scattering angle and Eq. (3) refers to the case of two monoenergetic colliding beams. In the case of an electron at rest, Eq. (3) simply reduces to the Klein–Nishina theory. Equation (3) contains the flux factor $(\mathbf{K}/\mathbf{E}\omega)$, for the flux factor, one then has $\mathbf{K}/\mathbf{E}\omega \rightarrow 1$, i.e., for a stationary target, the flux factor equals the velocity of light.

Consider now the case of an electron occupying a bound state with energy E_i and wave function $\psi_i(r)$ before the scattering takes place. The momentum distribution of the initial state is

$$\rho(p)=|\psi_i(p)|^2, \quad (7)$$

where $\psi_i(p)$ is the momentum transfer of $\psi_i(r)$. For lighter elements, it suffices to use the nonrelativistic transform

$$\psi_i(p)=(1/(2\pi)^{1.5})\int dr \;\; e^{-ip.r}(r). \quad (8)$$

For heavier elements, the corresponding relativistic transform may be required. If several electron states are occupied, the momentum distribution is

$$\rho(p)=\sum_i^{\text{occ}} |\psi_i(p)|^2. \quad (9)$$

The probability that the momentum of an electron falls in the interval $(\mathbf{p},\mathbf{p}+d\mathbf{p})$ is $\rho(\mathbf{p})d\mathbf{p}/n$, if $\rho(\mathbf{p})$ is normalized to the number of electrons per atom n. For a system at rest, the mean value of $\mathbf{p}$ is zero and $\rho(\mathbf{p})$ describes a stationary wave packet of free electron states. The energy transfer during the collision is much larger than the binding energy, the latter may be ignored. The scattering is the same as for free particles, but weighted by the probability that a certain plane-wave state appears in the wave packet.

$$\sigma=(m^2r_0^2/2)\int d^3k'd^3p'd^3p(\rho(p))/(EE'\omega_1\omega_2) \times\overline{X}(K,K')\delta(p+k-p'-k')\delta(E+\omega_1-E'-\omega^2). \quad (10)$$

Here the flux factor $(\mathbf{K}/\mathbf{E}\omega)$ is replaced by $c=1$ since the wave packet is stationary. $\mathbf{E}$ and $\mathbf{E}'$ are interpreted as relativistic free-particle energies. Equation (10) is usually referred to as the IA, i.e., the binding energy is assumed to be negligible and the scattering is a one-particle process with free electron states as final states and give the total cross section.[12,13]

The double differential cross section with respect to the solid angle Ω' and energy ω_2 of the outgoing photon is obtained by differentiating Eq. (10) with respect to Ω' and ω_2 and integrating over p

$$d^2\sigma/d\omega_2 d\Omega'=(m^2r_0^2\omega_2/2\omega_1)d^3p(\rho(p)) \times(\overline{X}(K,K')/EE')\delta(E+\omega_1-E'-\omega_2). \quad (11)$$

The slowly varying function, $\overline{\mathbf{X}}(\mathbf{K},\mathbf{K}')$ in Eq. (10) is further simplified and the approximate expression is as follows:

$$d^2\sigma/d\omega_2 d\Omega'\approx(m^2r_0^2\omega_2)/[2\omega_1]|k-k'|^{-1}\sqrt{m^2+p_z^2} \times\overline{X}(R,R')J(p_z), \quad (12)$$

where

$$|\vec{k}-\vec{k}'|=(\omega_1^2+\omega_2^2-2\omega_1\omega_2\cos(\theta))^{0.5} \quad (13)$$

and

$$P_Z=\omega_1\omega_2(1-\cos(\theta))-m(\omega_1-\omega_2) \times[(\omega_1^2+\omega_2^2-2\omega_1\omega^2\cos(\theta))^{0.5}]^{-1},$$

$$d\omega_2/dp_z=|k-k'|[m(\omega_1/\omega_2) -p_z(\omega_2-\omega_1\cos(\theta))/|k-k'|]^{-1}. \quad (14)$$

Here, P_z is the projection of the momentum of the initial electron on the scattering vector $\mathbf{q}=\mathbf{k}'-\mathbf{k}$, i.e., $p_z=\mathbf{p}\cdot\mathbf{q}/q$. The arguments R and R' in the factor $\overline{X}$ are given by

$$R=\omega_1[(m^2+p_z^2)^{0.5}+(\omega_1-\omega_2\cos\theta)p_z/|k'-k|, \quad (15)$$

$$R'=R-\omega_1\omega_2(1-\cos\theta). \quad (16)$$

Finally, $J(p_z)$ is the Compton profile. For an isotropic or polycrystalline system, it is defined as

$$J(p_z)=2\pi\int_{|p_z|}^{\infty}dp \;\; p\rho(p). \quad (17)$$

In the IA, the double differential cross section thus reflects the momentum distribution of the scatterer in a very simple way. In Eq. (12) $J(p_z)$ gives rise to a broadening of the Compton line because of the motion of the electrons before collision and $\overline{X}/\sqrt{m^2+p_z^2}$ reflects relativistic effects in the scattering process. If the relativistic factors are less important, such as, e.g., at relatively low energy and momentum transfers, we may put $p_z=0$ in the relativistic factor. The function of $X(R,R')$ then reduces to a Klein–Nishina type of expression

$$\overline{X}_{\text{KN}}=\omega_1/\omega_2^c+\omega_2^c/\omega_1-\sin^2(\theta), \quad (18)$$

$$d^2\sigma/d\Omega' d\omega_2=(r_0^2/2)m(\omega_2/\omega_1)|\vec{k}_1-\vec{k}'|^{-1}\overline{X}_{\text{KN}}J(p_z). \quad (19)$$

The relativistic double differential cross section for scattering of an initially unpolarized x-ray photon is as follows: The above expression is further simplified by putting $\omega_1 \approx\omega_2$ in $\overline{X}_{\text{KN}}$. The nonrelativistic expression in the above approximation is

$$d^2\sigma/d\Omega' d\omega_2=(r_0^2/2)m(\omega^2/\omega_1)|\vec{k}-\vec{k}'|^{-1} \times(1+\cos^2(\theta))J(p_z). \quad (20)$$

The numerical difference in using Eqs. (19) and (20) is on the order of less than 1% if integrated over the scattered photon energy. The total cross sections are calculated using linear approximations and the energy absorption cross section for electrons scattered by photons with the use of the same method. The approximate method requires the knowledge of the $J_i(0)$s and the binding energies for the electrons.[14]

The total cross section is obtained by integrating Eq. (19) over energy and solid angle intervals and the cross section for a specific shell is obtained[15]

$$\sigma_i=(\pi r_0^2/\omega_1)\int\int d\theta d\omega_2(\omega_2/|\vec{k}-\vec{k}'|) \times(\omega_1/\omega_2^c+\omega_2^c/\omega_1-\sin^2\theta)\sin\theta J_i(p_z). \quad (21)$$

The limit of the integration in Eq. (21) for the energy of the scattered photon ω_2 up to $\omega_2=\omega_1-I_i$, where I_i is the ionization energy of the electron in the ith shell and ω_2^c is the energy of the Compton scattered photon. The total cross section is the summation over the occupied shells. The differential form of Eq. (14) and with $p_z=0$, further simplifies Eq. (21).

$$\sigma_i=\pi r_0^2\int_0^{\pi} d\theta(\omega_2^c/\omega_1)^2(\omega_1/\omega_2^c+\omega_2^c/\omega_1-\sin^2\theta)\sin\theta \times\int_{-m}^{p_{i\,\max}} dp_z J_i(p_z). \quad (22)$$

The scattering of photons of energy ω_1 by electrons in atoms, molecules, or condensed matter will result in an energy loss $(\omega_1-\omega_2)$, where ω_2 is the energy of the scattered photon. The energy $(\omega_1-\omega_2)$ is transferred to the electron (including the binding energy) and the energy absorption cross-section per atom (ignoring emissions of fluorescent photons) may be written as

$$\sigma_{\rm en}=(1/\omega_1)\int\int(1-g(\omega_1-\omega_2,Z))(\omega_1-\omega_2) \times d^2\sigma/(d\Omega' d\omega_2)d\Omega' d\omega_2. \quad (23)$$

The numerical integration of Eq. (22) with double differential scattering cross section excluding those electrons for which $(\omega_1-\omega_2)<E_B$ will give the following simplified expression for the energy absorption per electron:[16]

$$\sigma_{\rm en}=\pi r_0^2\int_0^{\pi} d\theta\sin\theta(\omega_2^c/\omega_1)(1-\omega_2^c/\omega_1) \times\left\{\omega_2^c/\omega_1+\omega_1/\omega_2^c-\sin^2(\theta)\sum_i\int_{-\infty}^{p_z(\omega_1-I_i)} dp_z J_i(p_z) \times\{1+\alpha(\omega_1,\omega_2^c,\theta)p_z/m+\beta(\omega_1,\omega_2^c,\theta)(p_z/m)^2\}\right. \times(1-g(Z)). \quad (24)$$

In Eqs. (22) and (24) $P_{i\,\max}$ is the highest P_Z value for which an electron in orbital number i is able to be excited. The $P_{i\,\max}$ is obtained by putting ω_2 up to $\omega_2=\omega_1-I_i$, in Eq. (14), where I_i is the ionization energy of the electron in the ith shell. The $P_{i\,\max}$ may be positive or negative. The integration is over the solid angle $d\Omega'$ and the energy integration is extended to all the shells K, L, and M for electrons in the orbits. In Eq. (23) $g(\omega_1-\omega_2,Z)$ is the expectation value of the fraction of the energy transfer $(\omega_1-\omega_2)$ which is lost due to bremsstrahlung when the liberated secondary electrons (the Compton electron, Auger and Coster–Kronig electrons) are slowed down.[17]

The Compton profile, $J(P_Z)$, in Eqs. (19) and (20), takes into account the fact that the electrons in the atom have distribution of velocities. This causes a Doppler shift for the scattered photon. Instead of the single Compton energy, the scattered photons show a broadened spectrum of energies.

The whole atom scattering cross section for unpolarized photons for each subshell is evaluated using the following relation:

$$d^2\sigma/d\Omega' d\omega'=\sum N_i(d^2\sigma/d\Omega' d\omega')_i. \quad (25)$$

Here i denotes the subshell number, N_i is the number of electrons in the ith shell and $J_i(P_Z)$ is the Compton profile of an electron in the ith shell. However, the summation excludes those electrons for which $(\omega_1-\omega_2)<E_B$. Energy transfers $(\omega_1-\omega_2)$ less than the binding energy of the electrons cannot occur. The presence of the absorption edge causes a considerable asymmetry in the energy distribution of the Compton scattered photons, particularly at low incident photon energies.

Two sets of theoretical calculations of total scattering cross sections are available in the literature. The first set of calculations are estimated using double differential scattering cross sections of Eqs. (19) and (20) based on impulse approximation with Compton profile values. The second set of calculations are derived from differential incoherent scattering cross section per electron (Klein–Nishina) multiplied by nonrelativistic incoherent function, which is a measure of electron binding.

The later calculations are based on simplified assumption that the scattered photons are monoenergetic and have energy ω_2^c (Compton energy), i.e., values of $\sigma_{\rm en}$ are calculated from

$$\sigma_{\rm en}=(1/\omega_1)\int(1-g(\omega_1-\omega_2,Z))(\omega_1-\omega_2^c) \times(d\sigma_{\rm KN}/d\Omega')S(X,Z)d\Omega', \quad (26)$$

where $(d\sigma_{\rm KN}/d\Omega')$ is the differential incoherent scattering cross section per electron and $S(X,Z)$ is the incoherent scattering function $[X=\sin(\theta/2)/\lambda,\ \lambda=12.3985/\omega_1$, if λ is in units of angstrom and ω_1 in keV$]$.[18–21]

The Compton profile for the biological materials is calculated by weighted addition, e.g., for bone

TABLE 2. Name of the material, density and chemical formula[a] ($N_A = 6.023\times10^{23}$ atoms/mol, M = molecular weight)

Name	ρ (g/cm^3)	Formula	$N_A\rho$	M	$N_A\rho$/M
Water	1.00	H_2O	6.02×10^{23}	18.02	33.4×10^{21}
Polyethylene	0.92	C_2H_4	5.54×10^{23}	28.05	19.8×10^{21}
Lucite	1.19	$C_5H_8O_2$	7.17×10^{23}	100.12	7.16×10^{21}
Polystyrene	1.05	C_8H_8	6.32×10^{23}	104.15	6.07×10^{21}
Nylon	1.15	$C_6H_{11}NO$	6.93×10^{23}	113.16	6.12×10^{21}
Polycarbonate	1.20	$C_{16}H_{14}O_3$	7.23×10^{23}	254.28	2.84×10^{21}
Bakelite	1.70	$C_{43}H_{38}O_7$	10.24×10^{23}	666.78	1.54×10^{21}
Fat (Adipose tissue)	0.95	$C_{55}H_{102}O_6$	5.72×10^{23}	859.42	0.67×10^{21}
Bone	1.85	$H_8O_{26}P_9Ca_6$	11.1×10^{23}	943.29	1.18×10^{21}
Calcium hydroxyapatite	3.74	$[Ca_3(PO_4)_2]_3Ca(OH)_2$	22.5×10^{23}	1004.64	2.24×10^{21}

[a]See Refs. 29 and 30.

$$J_i(p_z) = 8J(p_z)_{\mathrm{H}} + 26J(p_z)_o + 9J(p_z)_p + 6J(p_z)_{\mathrm{Ca}}. \tag{27}$$

4. Geometrical Broadening

The influence of scattering geometry on the geometrical energy broadening is given by both ΔG and the incident photon energy, i.e., ω_1

$$\Delta G(\omega_1) = \omega_1 m_0 c^2[(m_0c^2 - \omega_1\cos(\theta_{\min}))^{-1} - ((m_0c^2 - \omega_1\cos(\theta_{\max}))^{-1}]. \tag{28}$$

The scattering angle considered is 90° and ΔG is estimated by assuming $\theta_{\min}$ and $\theta_{\max}$ is symmetrically situated around $\theta = 90°$. In order to know more about the contribution of broadening in a rigorous way, FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) is estimated using the following relations:[22]

$$\mathrm{FWHM}(J(p_z)) = 2(\omega_2/\omega_1)[\omega_1^2 + \omega_2^2 - 2\omega_1\omega_2\cos(\theta)]^{0.5} \times (p_z/137), \tag{29}$$

$$\mathrm{FWHM(CB)} = 2(\omega_2/\omega_1)(\omega_1^2+\omega_2^2)^{0.5}(p_z/137) \times [(1-\omega_2/m_0c^2) - \omega_2((\omega_1^2+\omega_2^2)^{0.5} \times p_z/\omega_1 m_0 c^2 137)^2]^{-1}. \tag{30}$$

5. Results and Discussion

The energies of x-ray source, name, density, and chemical formula of all the materials are presented in Tables 1 and 2. Our calculations are based on the following approximations and it is easy to evaluate the total scattering cross sections and Compton energy absorption cross sections for the individual shells and the whole atom. We followed the following procedure for the limits of integration: $\omega_{2(\max)} = \omega_1 - \omega_2$, $E_{\mathrm{KE}} = \omega_1 - \omega_2 - E_B$, $\omega_2 = \omega_{2(\max)}$, $\omega_2 = \omega_{2(\max)}/2000$ values for the scattered photon energy. The numerical integration analysis is performed using MATHEMATICA software package.[23] We generated the Compton profile function with the use of $J_i(0)$s and the binding energies for the electrons. For each incoming photon energy, we have entered the number of shells/subshells in the atom manually. This program generates the data with exclusion of those electrons for which $\omega_1 - \omega_2 < E_B$ in Eq. (25) by introducing an absorption edge in the double differential cross section. In this way we entered the binding energy for each shell and also with exclusion of those electrons for which $\omega_1 - \omega_2 < E_B$ and the data are evaluated in the energy region from 0.005 to 0.5 MeV.

Nonrelativistic and relativistic double differential scattering cross sections for single atoms such as, H, C, N, O, P, and Ca are evaluated using Eqs. (19) and (20) and the tabulated data of $J_i(P_Z)$ for a number of $K\alpha$ values. The numerical calculations are confined to the whole atom. The cross section per atom is evaluated around the centroid of the peak with an energy interval of 0.1 and 1 keV for 59.54 keV photons. The numerical difference of the results is on the order of 1%. We have also chosen a very small energy interval since the variation of the relativistic form factor is very small. The nonrelativistic and relativistic double differential scattering cross sections evaluated for single atoms using the Compton profile data[23] are presented in Tables 3 and 4. However, nonrelativistic double differential scattering cross section [Eq. (20)] is a good approximation only when $\omega \cong \omega_c$, and not good for a few hundred keV and not valid for 1 MeV and more. For example, at 10 MeV and $\theta = 30°$, the nonrelativistic double differential scattering cross section [Eq. (20)] differs approximately 48% of relativistic double differential scattering cross section [Eq. (19)].

Relativistic double differential scattering cross sections (Compton profiles) for water, bone, fat, lucite, polycarbonate, bakelite, nylon, polystyrene, and polyethylene are estimated for a number of $K\alpha$ values using Eq. (19). These scattering cross sections are presented in Table 5 with an energy interval of 0.1 keV around the centroid of the Compton profile and 1 keV for 59.54 keV photons.

The geometrical energy broadening ΔG is estimated by assuming $\theta_{\min}$ and $\theta_{\max}$ are symmetrically situated around $\theta = 90°$ in the energy region 5–500 keV using Eq. (28) and is presented in Table 6. Figure 1(a) shows the contribution of

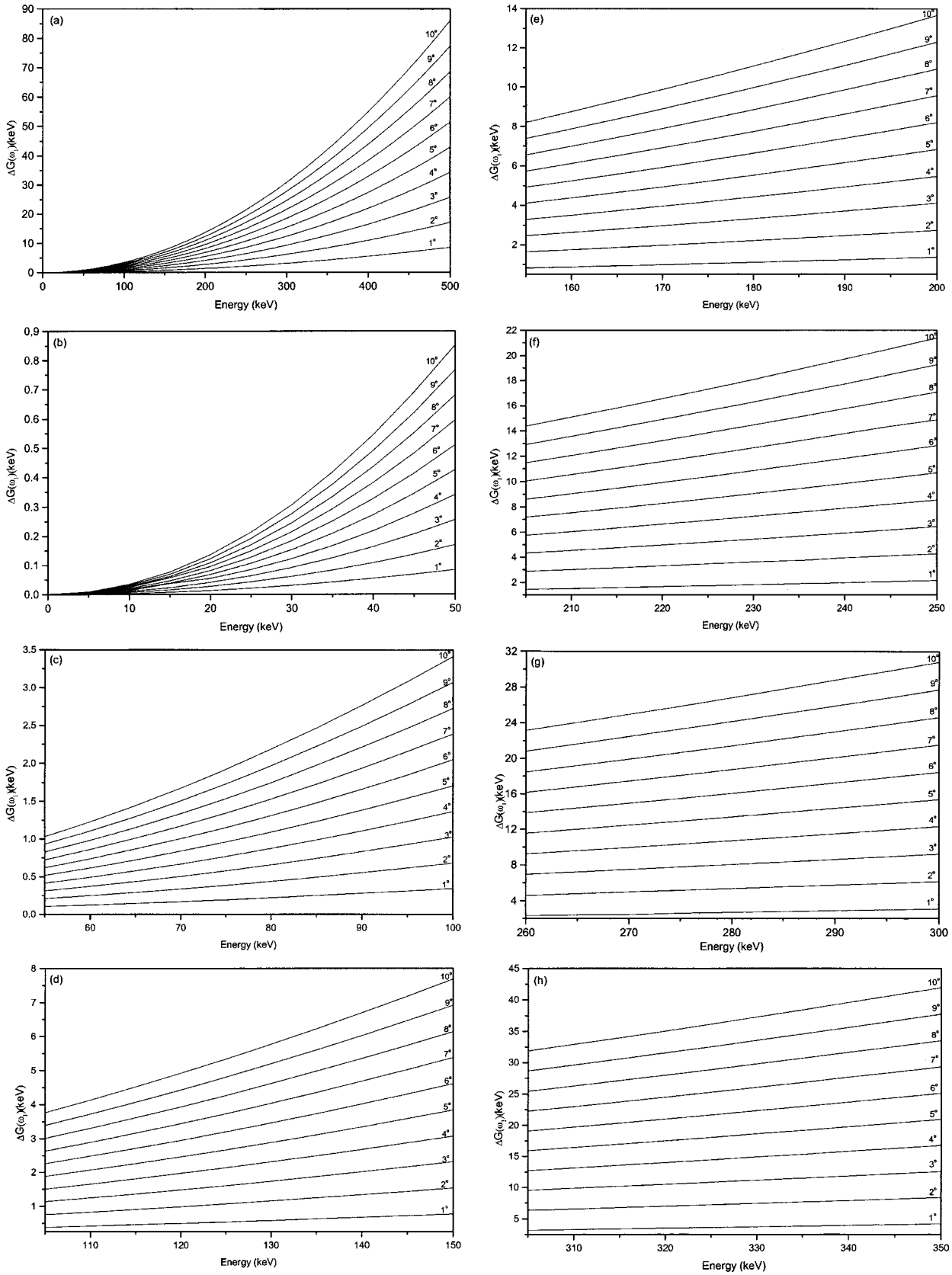

FIG. 1. (a) Variation of geometrical energy broadening $\Delta G(\omega_1)$ (keV) in the energy region from 1 to 500 keV around the centroid of the Compton profile with an interval of 1°. (b) Contribution of geometrical energy broadening in the energy region from 1 to 50 keV around the centroid of the Compton profile with an interval of 1°. Same as in (b) but for the region up to (c) 100 keV; (d) 150 keV; (e) 200 keV; (f) 250 keV; (g) 300 keV; (h) 350 keV; (i) 400 keV; (j) 450 keV; and (k) 500 keV.

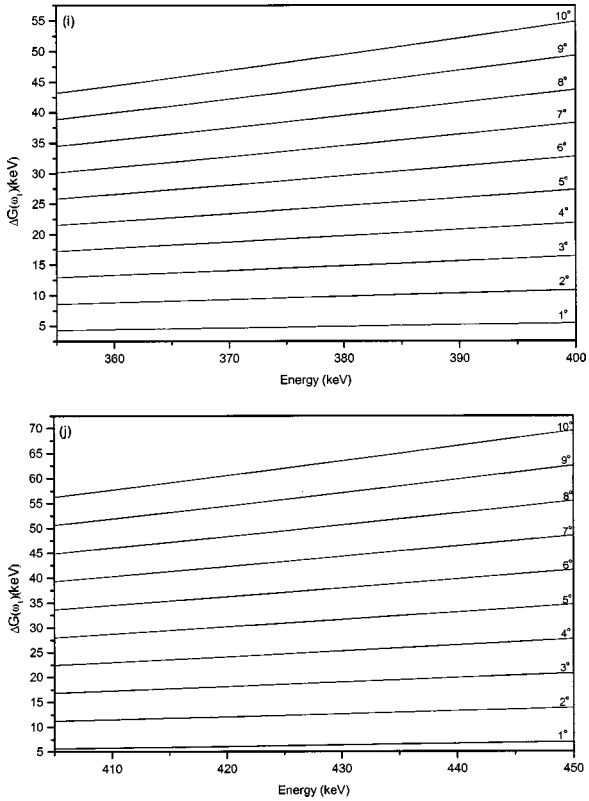

FIG. 1. (*Continued.*)

the energy broadening in the energy region up to 500 keV with an angular interval of 1° around the centroid of the Compton profile. Figures 1(b)–1(k) show the variation of the broadening in different regions with an angular interval of 1°. The Compton energy broadening for primary photons with scattering angle is shown in Figs. 2(a)–2(j). Equation (28) applies to the energy broadening of primary photons, when primary photon energy spectra are reconstructed from the measurements of scattered photons assuming all detected photons have been scattered at 90°.

The data in Table 6 will be very useful, for example, for the extra broadening of the Compton profile, which arises from a beam divergence of ±1° in the scattering plane. Also for forward scatter imaging, the annular detector subtends a very small solid angle and receives only those photons scattered in the forward direction within $\theta_{\min} \leqslant \theta \leqslant \theta_{\max}$.

The contribution of the energy broadening for primary photons will be obtained at any desired angle and energy around the centroid of the Compton profile to assess the geometrical efficiency of the system and it will be easy to find the optimum angle–energy combination for experimental studies. The width of the broadening is more severe up to 150 keV and reduces considerably in the energy region up to 350 keV and increases up to 500 keV. It is interesting to note that the width of the geometrical energy broadening is relatively small at small angles and energies as distinguished from large angles and high energies. For a better matching in selecting large and small angles, we considered the optimum value of 90°, where Rayleigh and Compton scattering are very well separated and detected with present day semiconductor detectors. In view of this, the optimum value at 90° is a good choice.

Recently, we have studied the importance of Doppler broadening in Compton scatter imaging techniques at low photon energies[24] and this approach is based on geometrical considerations. The electrons moving in the target cause energy broadening of the scattered photons that is larger than the intrinsic energy resolution of the detector. A new approach is developed to estimate the degree of monochromacy, solid angle correction, and efficiency of the measuring system using x-ray tube, Hp Ge detector, and a translation–rotation table containing the sample. The solid angle contribution is assessed and included by changing the diameter of the collimator at the exit end of the x-ray tube and at the entrance of the detector collimator. The effective solid angle and total geometrical efficiency is evaluated at 90° and the optimum value is used for the experimental work. The energy broadening is evaluated around the centroid of the Compton profile with an angular interval of 1° and the contribution of Doppler broadening is assessed.[25]

The total cross sections based on Eq. (26) will be used for each scattering angle. It is interesting to note that the incoherent scattering function $S(X,Z)$ increases monotonically with increasing momentum transfer, approaching Z, as $X \rightarrow \infty$. At high photon energies ($\lambda \rightarrow 0, X \rightarrow \infty$) the scattering approaches that against free electrons at rest $(d\sigma_{\mathrm{KN}}/d\Omega')Z$ being the free electron differential scattering cross section per atom. For a given value of X, the deviation of $S(X,Z)$ from its upper limit Z increases with increasing atomic number, i.e., with higher binding energies of the atomic electrons and the underestimated true energy transfer is compensated considerably in computations. The neglect of the energy broadening from the Compton scattered photons results in an underestimate of the energy transferred to the Compton electrons. To a first approximation this underestimation can be compensated for simply neglecting the influence of the electron binding on the differential cross section per unit solid angle. The cross section is suppressed at low energies due to electron binding effects, reaching a broad maximum before dropping off at high energy due to the nature of the Klein–Nishina cross section.

The double differential individual shell scattering cross sections are evaluated with Eq. (25) and using Eq. (19). The derived double differential scattering cross sections will reflect on the current knowledge of the tabulations of total cross sections estimated using Eqs. (21) and (22). However, the two sets of tabulations are compared independently. The tabulations based on Eqs. (23) and (24) will be used only to select the energy of the scattered photon.

The FWHM of the Compton profile and FWHM of the Compton broadening is estimated for the biological materials at 90° for various incident photons and displayed in Figs. 3(a)–3(h). Figures 4(a)–4(d) show the Gaussian fit of few biological materials of medical interest in the x-ray region in an extended scale in order to observe the difference of attenuation around the centroid of the Compton profile for

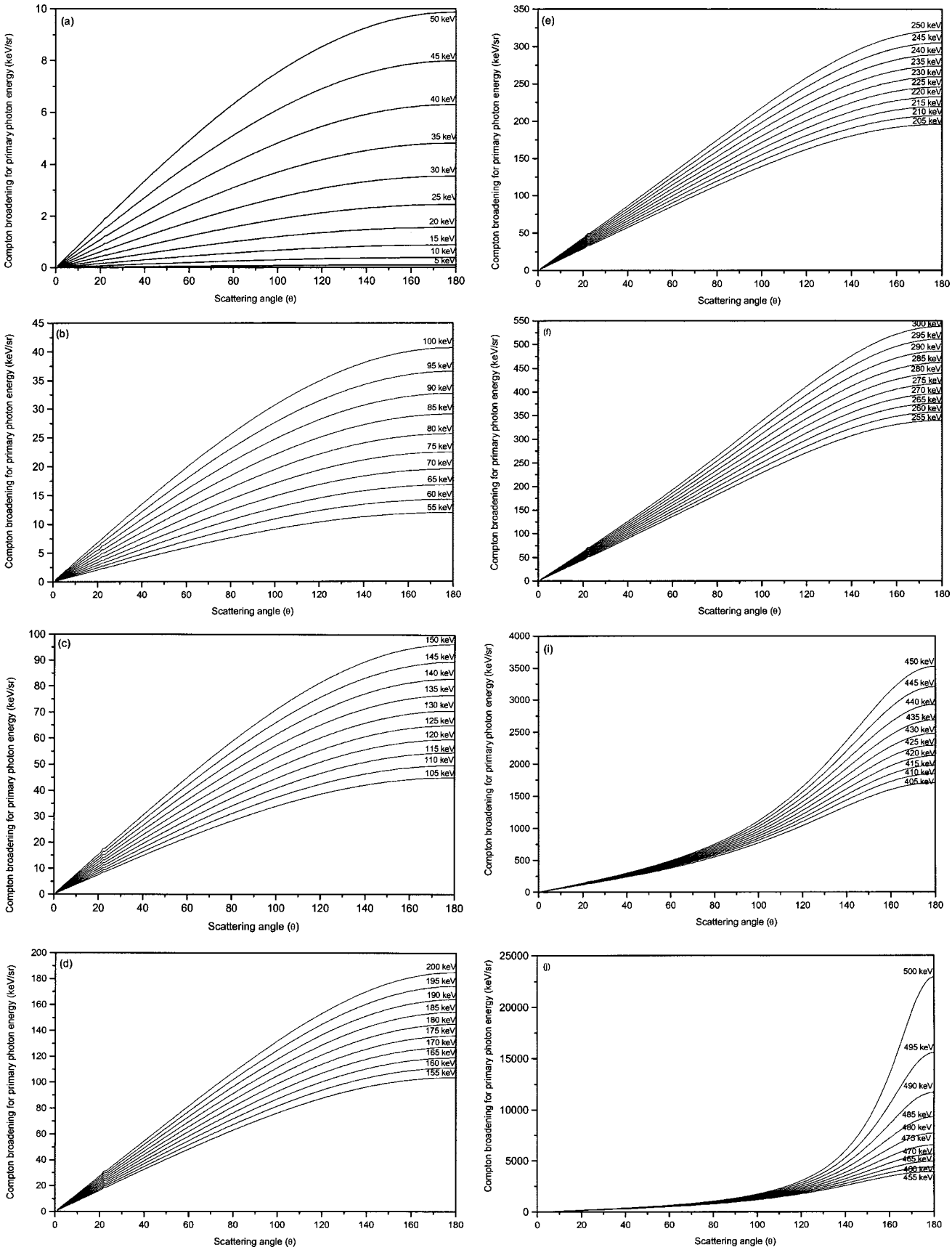

FIG. 2. (a) Compton broadening for primary photon energy (keV/sr) in the angular region 1°–180° from 1 to 50 keV. Same as in (a) but for the region up to (b) 100 keV; (c) 150 keV; (d) 200 keV; (e) 250 keV; (f) 300 keV; (g) 350 keV; (h) 400 keV; (i) 450 keV; and (j) 500 keV.

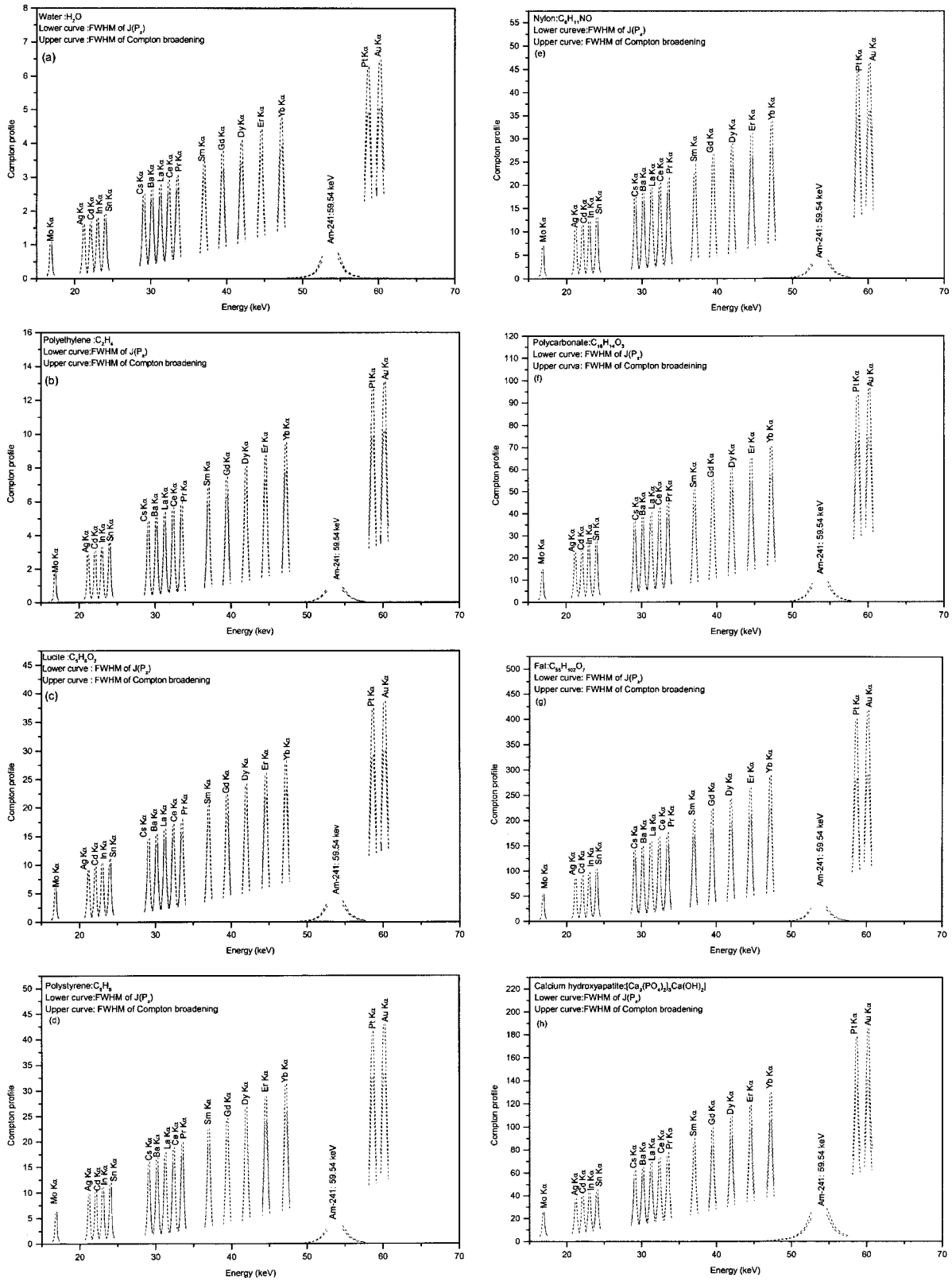

FIG. 3. Comparison of FWHM of $J(P_Z)$ and FWHM of Compton broadening in the energy region 17.44–68.18 keV for (a) water; (b) polyethylene; (c) lucite; (d) polystyrene; (e) nylon; (f) polycarbonate; (g) fat (adipose tissue); and (h) calcium hydroxyapatite.

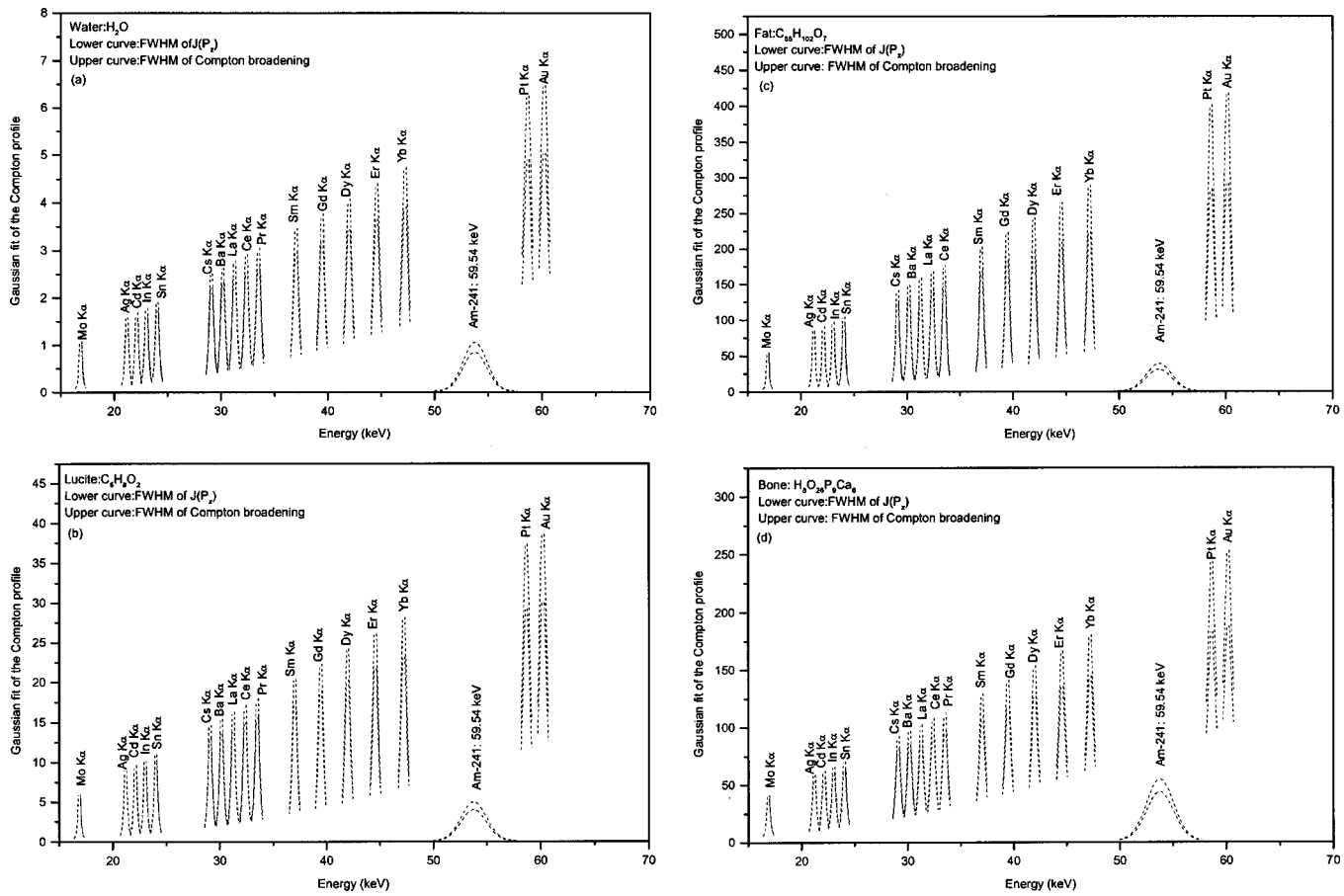

FIG. 4. Gaussian fit of the FWHM of $J(P_Z)$ and FWHM of Compton broadening for few materials in the energy region 17.44–68.18 keV for (a) water; (b) lucite; (c) fat (adipose tissue); and (d) bone.

59.54 keV photons. The derived data using Eqs. (29) and (30) is presented in Tables 7 and 8. The full width at half maximum is choosen as approximately 1 keV, since the *K*-shell electrons provide the major contribution to the peak at energies well away from the Compton energy and peaks are well resolved using semiconductor detectors. It increases with scattering angle and photon energy. The analysis is confined to a fixed angle and the study is focused mainly around the peak region with variable energy with an angular interval of 1° in order to know the contribution of energy and geometrical broadening.

The total cross sections, individual shell cross sections, are presented in Table 9 along with the standard theoretical estimates and ratios in the energy region from 0.005 to 0.5 MeV for H, C, N, O, P, and Ca. It is interesting to note that the ratio between the two compilations is <1.15 and decreases with increasing photon energy. Figure 5 shows a comparison of the present Compton-energy absorption cross sections with theoretical estimates in the energy region 0.005–0.5 MeV for H, C, N, O, P, and Ca evaluated using Eq. (23). Figure 6 shows the ratio of the theoretical estimates.

The energy broadening of the scattered photons from these materials reflects the momentum distribution of the target electrons. The Compton energy absorption cross sections deviate numerically from the standard theoretical estimates. The cause of the numerical discrepancies is not fully understood but can be attributed to Doppler broadening of the Compton scattered photons through a given angle. To give an orderly impression of the magnitude of the Doppler broadening effect the derived tabulations will be useful. The en-

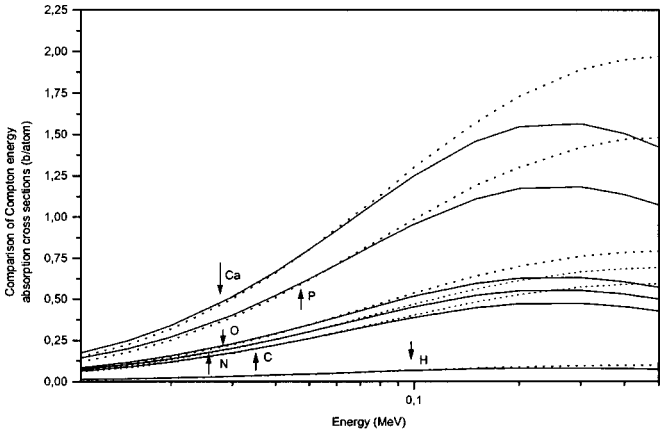

FIG. 5. Comparison of Compton-energy absorption cross sections for single atoms with theoretical estimates in the energy region from 0.005 to 0.5 MeV [1: $\sigma_{\mathrm{Biggs(present)}}$: Biggs *et al.*[10] (continuous curve) 2: σ_{SI}: Storm and Israel[21] (dashed curve)].

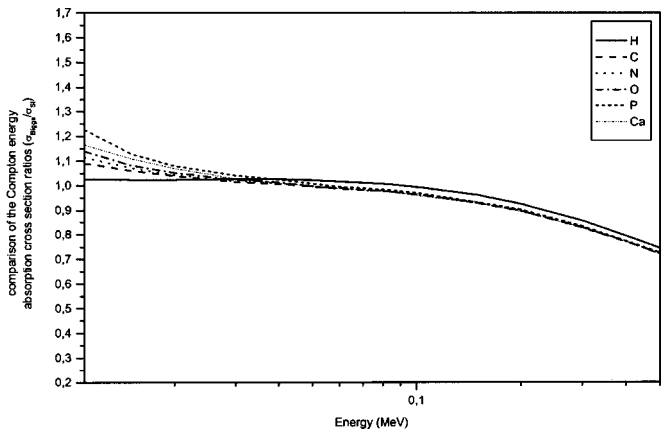

FIG. 6. Comparison of Compton-energy absorption cross section ratios for single atoms with theoretical estimates in the energy region from 0.005 to 0.5 MeV 1: $\sigma_{\mathrm{Biggs(present)}}$: Biggs *et al.*[10] 2: σ_{SI} : Storm and Israel.[21]

ergy distribution of the photons is asymmetric at the Compton energy at low photon energies and when the energy transfers are in the vicinity of absorption edges. The difference between the theoretical estimates is less than 1% in all of the cases considered. However, the cause of the significant differences at low energies can be explained in the following way. At low energies, the least tightly bound subshells provide most of the cross section. This is a result of the fact that the energy transfer must be high enough to overcome the electron binding in order to ionize. The subshell with the most tightly bound electrons, therefore, is the last one to overcome electron binding and contribute completely to the total cross section. At higher energies, each electron contributes equally to the overall cross section and the subshell ratios are determined by the number of electrons in the given subshell. It is interesting that this transition to free electron behavior does not happen until fairly high energies, almost 500 keV for calcium. However, extensive up-to-date sources of x-ray cross sections are available in the literature highlighting the required accuracy and the data are instrumental in the continuous understanding and critical evaluation of cross sections.[26–28]

6. Conclusion

With the increasing use of low energy x-ray photons in medical applications, the scattering cross sections are very useful for compilation and simulation purposes. The data will be useful to assess the contribution of Doppler broadening and to calculate the Compton component of the mass-energy absorption coefficient.

7. Acknowledgments

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TABLE 3. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (nonrelativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90°

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
			Mo $K\alpha$: 17.44 keV				
16.3644	−2.9622	1.75E−32	3.60E−30	4.18E−30	4.98E−30	1.46E−29	1.65E−29
16.4644	2.3630	6.64E−32	4.96E−30	5.95E−30	7.48E−30	1.92E−29	2.12E−29
16.5644	1.9673	1.59E−31	6.29E−30	8.00E−30	1.06E−29	2.26E−29	2.69E−29
16.6644	1.1749	1.39E−30	1.43E−29	2.03E−29	2.59E−29	3.39E−29	5.28E−29
16.7644	0.5858	7.59E−30	3.85E−29	4.42E−29	4.82E−29	7.00E−29	7.88E−29
16.8644							
16.9644	+0.5821	7.70E−30	3.90E−29	4.47E−29	4.86E−29	7.08E−29	7.94E−29
17.0644	1.1611	1.47E−30	1.49E−29	2.08E−29	2.65E−29	3.48E−29	5.42E−29
17.1644	1.7368	1.98E−31	7.68E−30	1.02E−29	1.37E−29	2.53E−29	3.29E−29
17.2644	2.3091	8.12E−32	5.26E−30	6.36E−30	8.09E−30	2.02E−29	2.25E−29
17.3644	2.8782	1.61E−32	3.91E−30	4.56E−30	5.51E−30	1.58E−29	1.76E−29
			Ag $K\alpha$: 22.10 keV				
20.6838	−2.3610	5.38E−32	3.90E−30	4.68E−30	5.90E−30	1.51E−29	1.67E−29
20.7838	1.8846	1.55E−31	5.26E−30	6.81E−30	9.03E−30	1.84E−29	2.25E−29
20.8838	1.4103	5.38E−31	8.17E−30	1.15E−29	1.53E−29	2.27E−29	3.36E−29
20.9838	0.9381	2.26E−30	1.67E−29	2.20E−29	2.70E−29	3.42E−29	5.02E−29
21.0838	0.4681	7.98E−30	3.69E−29	3.91E−29	4.13E−29	6.47E−29	6.75E−29
21.1838							
21.2838	+0.4657	8.09E−30	3.60E−29	3.95E−29	4.15E−29	6.54E−29	6.81E−29
21.3838	0.9214	2.40E−30	1.75E−29	2.30E−29	2.78E−29	3.45E−29	5.13E−29
21.4838	1.3910	5.76E−31	8.51E−30	1.19E−29	1.58E−29	2.33E−29	3.46E−29
21.5838	1.8505	1.70E−31	5.49E−30	7.15E−30	9.50E−30	1.90E−29	2.35E−29
21.6838	2.3079	6.38E−32	4.13E−30	5.00E−30	6.35E−30	1.59E−29	1.77E−29
			Cd $K\alpha$: 23.10 keV				
21.601	−2.2635	6.59E−32	3.96E−30	4.83E−30	6.18E−30	1.51E−29	1.69E−29
21.701	1.8068	1.77E−31	5.31E−30	6.97E−30	9.29E−30	1.82E−29	2.28E−29
21.801	1.3520	6.27E−31	8.50E−30	1.19E−29	1.57E−29	2.25E−29	3.39E−29
21.901	0.8993	2.42E−30	1.72E−29	2.26E−29	2.69E−29	3.42E−29	4.93E−29
22.001	0.4583	7.79E−30	3.46E−29	3.77E−29	3.96E−29	6.26E−29	6.51E−29
22.101							
22.201	+0.4473	8.04E−30	3.53E−29	3.83E−29	4.00E−29	6.38E−29	6.55E−29
22.301	0.8923	2.50E−30	1.75E−29	2.29E−29	2.73E−29	3.49E−29	4.99E−29
22.401	1.3354	6.71E−31	8.83E−30	1.24E−29	1.63E−29	2.31E−29	3.49E−29
22.501	1.7765	1.99E−31	5.56E−30	7.35E−30	9.82E−30	1.87E−29	2.39E−29
22.601	2.2158	7.57E−32	4.18E−30	5.13E−30	6.60E−30	1.58E−29	1.78E−29
			In $K\alpha$: 24.14 keV				
22.5159	−2.1678	7.84E−32	4.01E−30	4.95E−30	6.41E−30	1.50E−29	1.71E−29
22.6159	1.7299	2.13E−31	5.44E−30	7.26E−30	9.71E−30	1.79E−29	2.33E−29
22.7159	1.2938	7.18E−31	8.80E−30	1.24E−29	1.61E−29	2.23E−29	3.41E−29
22.8159	0.8595	2.57E−30	1.75E−29	2.27E−29	2.69E−29	3.44E−29	4.84E−29
22.9159	0.4270	7.97E−30	3.44E−29	3.70E−29	3.85E−29	6.21E−29	6.40E−29
23.0159							
23.1159	+0.4325	7.93E−30	3.43E−29	3.70E−29	3.86E−29	6.20E−29	6.40E−29
23.2159	0.8597	2.59E−30	1.77E−29	2.29E−29	2.71E−29	3.48E−29	4.89E−29
23.3159	1.2851	7.43E−31	9.03E−30	1.27E−29	1.65E−29	2.28E−29	3.49E−29
23.4159	1.7087	2.29E−31	5.65E−30	7.59E−30	1.01E−29	1.84E−29	2.42E−29
23.5159	2.1306	8.65E−32	4.19E−30	5.20E−30	6.76E−30	1.56E−29	1.81E−29
			Sn $K\alpha$: 25.20 keV				
23.516	−2.0839	8.69E−32	4.02E−30	5.03E−30	6.57E−30	1.48E−29	1.72E−29
23.616	1.6636	2.42E−31	5.52E−30	7.46E−30	1.00E−29	1.76E−29	2.36E−29
23.716	1.2448	7.78E−31	8.98E−30	1.26E−29	1.63E−29	2.20E−29	3.42E−29
23.816	0.8278	2.66E−30	1.77E−29	2.26E−29	2.65E−29	3.42E−29	4.73E−29
23.916	0.4124	7.87E−30	3.35E−29	3.58E−29	3.72E−29	6.05E−29	6.22E−29
24.016							
24.116	+0.4135	7.90E−30	3.36E−29	3.60E−29	3.73E−29	6.07E−29	6.24E−29
24.216	0.8240	2.72E−30	1.79E−29	2.29E−29	2.69E−29	3.46E−29	4.78E−29
24.316	1.2329	8.12E−31	9.24E−30	1.30E−29	1.68E−29	2.25E−29	3.50E−29
24.416	1.6401	2.58E−31	5.72E−30	7.76E−30	1.04E−29	1.80E−29	2.45E−29
24.516	2.0458	9.48E−32	4.20E−30	5.27E−30	6.92E−30	1.54E−29	1.79E−29
			Cs $K\alpha$: 30.85 keV				
28.5936	−1.7267	1.64E−31	4.22E−30	7.53E−30	5.63E−30	1.40E−29	1.82E−29
28.6936	1.3791	4.30E−31	6.10E−30	1.13E−29	8.51E−30	1.65E−29	2.46E−29
28.7936	1.0326	1.18E−30	1.01E−29	1.72E−29	1.39E−29	2.16E−29	3.32E−29

TABLE 3. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (nonrelativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90°—Continued

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
28.8936	0.6873	3.21E−30	1.82E−29	2.47E−29	2.20E−29	3.38E−29	4.17E−29
28.9936	0.3430	7.32E−30	2.93E−29	3.12E−29	3.06E−29	5.27E−29	5.60E−29
29.0936							
29.1936	+0.3421	7.40E−30	2.94E−29	3.14E−29	3.07E−29	5.31E−29	5.66E−29
29.2936	0.6831	3.27E−30	1.85E−29	2.50E−29	2.23E−29	3.42E−29	5.42E−29
29.3936	1.0228	1.22E−30	1.04E−29	1.75E−29	1.42E−29	2.20E−29	3.38E−29
29.4936	1.3616	5.62E−31	7.73E−30	1.43E−29	1.08E−29	2.06E−29	3.09E−29
29.5936	1.6992	1.81E−31	4.42E−30	7.95E−30	5.93E−30	1.43E−29	1.89E−29
			Ba $K\alpha$: 32.06 keV				
29.6684	−1.6629	1.89E−31	4.31E−30	5.83E−30	7.82E−30	1.37E−29	1.84E−29
29.7684	1.3276	4.87E−31	6.30E−30	8.85E−30	1.16E−29	1.64E−29	2.47E−29
29.8684	0.9932	1.26E−30	1.03E−29	1.40E−29	1.73E−29	2.16E−29	3.29E−29
29.9684	0.6599	3.34E−30	1.85E−29	2.19E−29	2.43E−29	3.38E−29	4.07E−29
30.0684	0.3276	7.26E−30	2.87E−29	2.98E−29	3.03E−29	5.15E−29	5.53E−29
30.1684							
30.2684	+0.3338	7.19E−30	2.86E−29	2.97E−29	3.03E−29	5.13E−29	5.49E−29
30.3684	0.6629	3.34E−30	1.84E−29	2.19E−29	2.45E−29	3.39E−29	4.09E−29
30.4684	0.9911	1.28E−30	1.05E−29	1.42E−29	1.75E−29	2.19E−29	3.33E−29
30.5684	1.3182	5.05E−31	6.45E−30	9.07E−30	1.19E−29	1.67E−29	2.53E−29
30.6684	1.6444	2.01E−31	4.45E−30	6.05E−30	8.09E−30	1.40E−29	1.90E−29
			La $K\alpha$: 33.30 keV				
30.7617	−1.6128	2.03E−31	4.32E−30	5.89E−30	7.92E−30	1.35E−29	1.84E−29
30.8617	1.2889	5.23E−31	6.36E−30	8.94E−30	1.17E−29	1.61E−29	2.47E−29
30.9617	0.9660	1.34E−30	1.06E−29	1.41E−29	1.71E−29	2.16E−29	3.23E−29
31.0617	0.6441	3.36E−30	1.82E−29	2.14E−29	2.37E−29	3.33E−29	3.94E−29
31.1617	0.3232	7.01E−30	2.77E−29	2.87E−29	2.92E−29	4.97E−29	5.34E−29
31.2617							
31.3617	+0.3157	7.15E−30	2.80E−29	2.89E−29	2.94E−29	5.03E−29	5.43E−29
31.4617	0.6338	3.47E−30	1.85E−29	2.18E−29	2.41E−29	3.40E−29	3.99E−29
31.5617	0.9509	1.43E−30	1.09E−29	1.46E−29	1.76E−29	2.22E−29	3.30E−29
31.6617	1.2670	5.62E−31	6.65E−30	9.30E−30	1.21E−29	1.65E−29	2.55E−29
31.7617	1.5882	2.21E−31	4.51E−30	6.17E−30	8.28E−30	1.38E−29	1.92E−29
			Ce $K\alpha$: 34.57 keV				
31.878	−1.5598	2.30E−31	4.41E−30	6.06E−30	8.13E−30	1.33E−29	1.86E−29
31.978	1.2469	5.60E−31	6.47E−30	9.10E−30	1.18E−29	1.59E−29	2.46E−29
32.078	0.9350	1.44E−30	1.07E−29	1.42E−29	1.71E−29	2.15E−29	3.18E−29
32.178	0.6239	3.41E−30	1.80E−29	2.11E−29	2.32E−29	3.30E−29	3.83E−29
32.278	0.3138	6.88E−30	2.69E−29	2.77E−29	2.82E−29	4.83E−29	5.21E−29
32.378							
32.478	+0.3038	6.99E−30	2.73E−29	2.81E−29	2.84E−29	4.89E−29	5.32E−29
32.578	0.6113	3.53E−30	1.85E−29	2.16E−29	2.36E−29	3.37E−29	3.88E−29
32.678	0.9179	1.53E−30	1.11E−29	1.47E−29	1.76E−29	2.23E−29	3.25E−29
32.778	1.2236	6.00E−31	6.75E−30	9.50E−30	1.23E−29	1.63E−29	2.55E−29
32.878	1.5284	2.58E−31	4.65E−30	6.42E−30	8.58E−30	1.37E−29	1.95E−29
			Pr $K\alpha$: 35.86 keV				
33.0057	−1.5125	2.56E−31	4.48E−30	6.21E−30	8.30E−30	1.31E−29	1.87E−29
33.1057	1.2101	5.86E−31	6.51E−30	9.16E−30	1.18E−29	1.56E−29	2.45E−29
33.2057	0.9084	1.50E−30	1.08E−29	1.42E−29	1.70E−29	2.16E−29	3.12E−29
33.3057	0.6075	3.41E−30	1.78E−29	2.07E−29	2.27E−29	3.25E−29	3.72E−29
33.4057	0.3075	6.68E−30	2.61E−29	2.69E−29	2.72E−29	4.67E−29	5.07E−29
33.5057							
33.6057	+0.2899	6.88E−30	2.65E−29	2.72E−29	2.75E−29	4.75E−29	5.25E−29
33.7057	0.5875	3.64E−30	1.84E−29	2.13E−29	2.32E−29	3.37E−29	3.79E−29
33.8057	0.8841	1.62E−30	1.13E−29	1.48E−29	1.75E−29	2.24E−29	3.20E−29
33.9057	1.1800	6.59E−31	6.90E−30	9.72E−30	1.24E−29	1.62E−29	2.55E−29
34.0057	1.4809	2.81E−31	4.71E−30	6.56E−30	8.74E−30	1.35E−29	1.95E−29
			Sm $K\alpha$: 39.92 keV				
36.5187	−1.3653	3.43E−31	4.76E−30	6.68E−30	8.81E−30	1.27E−29	1.86E−29
36.6187	1.0909	7.41E−31	7.01E−30	9.84E−30	1.23E−29	1.57E−29	2.41E−29
36.7187	0.8172	1.71E−30	1.11E−29	1.43E−29	1.67E−29	2.16E−29	2.97E−29
36.8187	0.5442	3.62E−30	1.75E−29	1.98E−29	2.13E−29	3.19E−29	3.46E−29
36.9187	0.2719	6.32E−30	2.40E−29	2.45E−29	2.46E−29	4.29E−29	4.88E−29
37.0187							
37.1187	+0.2708	6.37E−30	2.40E−29	2.46E−29	2.47E−29	4.31E−29	4.94E−29

TABLE 3. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (nonrelativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90°—Continued

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
37.2187	0.5411	3.68E−30	1.77E−29	2.00E−29	2.15E−29	3.22E−29	3.49E−29
37.3187	0.8108	1.74E−30	1.13E−29	1.45E−29	1.69E−29	2.19E−29	3.01E−29
37.4187	1.0797	8.10E−31	7.31E−30	1.00E−29	1.26E−29	1.60E−29	2.48E−29
37.5187	1.3480	3.76E−31	4.94E−30	6.94E−30	9.13E−30	1.30E−29	1.96E−29
			Gd $K\alpha$: 42.76 keV				
38.9574	−1.2853	4.06E−31	4.94E−30	6.94E−30	9.04E−30	1.24E−29	1.91E−29
39.0574	1.0274	8.56E−31	7.27E−30	9.93E−30	1.23E−29	1.55E−29	2.38E−29
39.1574	0.7706	1.81E−30	1.12E−29	1.41E−29	1.63E−29	2.14E−29	2.84E−29
39.2574	0.5135	3.63E−30	1.70E−29	1.90E−29	2.03E−29	3.09E−29	3.28E−29
39.3574	0.2575	6.01E−30	2.26E−29	2.29E−29	2.30E−29	4.03E−29	4.69E−29
39.4574							
39.5574	+0.2528	6.07E−30	2.27E−29	2.30E−29	2.31E−29	4.06E−29	4.75E−29
39.6574	0.5072	3.70E−30	1.73E−29	1.92E−29	2.05E−29	3.14E−29	3.32E−29
39.7574	0.7609	1.88E−30	1.16E−29	1.45E−29	1.66E−29	2.18E−29	2.88E−29
39.8574	1.0139	8.91E−31	7.50E−30	1.02E−29	1.23E−29	1.59E−29	2.43E−29
39.9574	1.2664	4.33E−31	5.13E−30	7.22E−30	9.37E−30	1.28E−29	1.97E−29
			Dy $K\alpha$: 45.72 keV				
41.4642	−1.2118	4.51E−31	5.01E−30	7.05E−30	9.16E−30	1.21E−29	1.89E−29
41.5642	0.9688	9.57E−31	7.47E−30	1.01E−29	1.23E−29	1.55E−29	2.31E−29
41.6642	0.7265	1.91E−30	1.14E−29	1.39E−29	1.59E−29	2.12E−29	2.72E−29
41.7642	0.4847	3.62E−30	1.65E−29	1.82E−29	1.93E−29	2.99E−29	3.13E−29
41.8642	0.2434	5.72E−30	2.13E−29	2.15E−29	2.16E−29	3.80E−29	4.49E−29
41.9642							
42.0642	+0.2376	5.78E−30	2.14E−29	2.16E−29	2.17E−29	3.82E−29	4.57E−29
42.1642	0.4773	3.70E−30	1.68E−29	1.84E−29	1.94E−29	3.04E−29	3.18E−29
42.2642	0.7165	1.99E−30	1.16E−29	1.43E−29	1.61E−29	2.17E−29	2.75E−29
42.3642	0.9552	1.01E−30	7.76E−20	1.04E−29	1.26E−29	1.59E−29	2.36E−29
42.4642	1.1934	4.84E−31	5.25E−30	7.38E−30	9.47E−30	1.25E−29	1.95E−29
			Er $K\alpha$: 48.81 keV				
44.055	−1.1395	5.45E−31	5.33E−30	7.39E−30	9.46E−30	1.22E−29	1.89E−29
44.155	0.9104	1.08E−30	7.79E−30	1.02E−29	1.23E−29	1.56E−29	2.26E−29
44.255	0.6816	2.03E−30	1.14E−29	1.36E−29	1.54E−29	2.12E−29	2.60E−29
44.355	0.4534	3.63E−30	1.61E−29	1.75E−29	1.83E−29	2.90E−29	3.01E−29
44.455	0.2256	5.47E−30	2.01E−29	2.02E−29	2.03E−29	3.59E−29	4.36E−29
44.555							
44.655	+0.2286	5.47E−30	2.01E−29	2.03E−29	2.03E−29	3.59E−29	4.35E−29
44.755	0.4550	3.65E−30	1.61E−29	1.76E−29	1.84E−29	2.91E−29	3.02E−29
44.855	0.6809	2.06E−30	1.16E−29	1.39E−29	1.56E−29	2.14E−29	2.62E−29
44.955	0.9064	1.11E−30	7.93E−30	1.04E−29	1.25E−29	1.58E−29	2.29E−29
45.055	1.1314	5.65E−31	5.47E−30	7.59E−30	9.60E−30	1.24E−29	2.68E−29
			Yb $K\alpha$: 52.02 keV				
46.7136	−1.7096	6.09E−31	5.49E−30	7.54E−30	9.46E−30	1.20E−29	1.86E−29
46.8136	0.8628	1.15E−30	7.89E−30	1.02E−29	1.21E−29	1.55E−29	2.18E−29
46.9136	0.6465	2.10E−30	1.13E−29	1.34E−29	1.49E−29	2.09E−29	2.48E−29
47.0136	0.4306	3.58E−30	1.55E−29	1.67E−29	1.74E−29	2.79E−29	2.89E−29
47.1136	0.2151	5.13E−30	1.89E−29	1.90E−29	1.90E−29	3.38E−29	4.16E−29
47.2136							
47.3136	+0.2145	5.20E−30	1.90E−29	1.91E−29	1.91E−29	3.39E−29	4.18E−29
47.4136	0.4288	3.66E−30	1.57E−29	1.69E−29	1.75E−29	2.82E−29	2.92E−29
47.5136	0.6426	2.13E−30	1.15E−29	1.36E−29	1.51E−29	2.12E−29	2.50E−29
47.6136	0.8561	1.19E−30	8.05E−30	1.04E−29	1.23E−29	1.57E−29	2.21E−29
47.7136	1.0691	6.33E−31	5.64E−30	7.71E−30	9.68E−30	1.23E−29	1.85E−29
			Pt $K\alpha$: 66.24 keV				
58.1402	−0.8754	8.66E−31	5.99E−30	7.79E−30	9.23E−30	1.18E−29	1.68E−29
58.2402	0.6993	1.40E−30	8.04E−30	9.77E−30	1.09E−29	1.49E−29	1.87E−29
58.3402	0.5235	2.23E−30	1.06E−29	1.19E−29	1.27E−29	1.92E−29	2.06E−29
58.4402	0.3478	3.27E−30	1.31E−29	1.37E−29	1.40E−29	2.36E−29	2.50E−29
58.5402	0.1725	4.22E−30	1.50E−29	1.50E−29	1.49E−29	2.67E−29	3.52E−29
58.6402							
58.7402	+0.1773	4.21E−30	1.51E−29	1.50E−29	1.49E−29	2.67E−29	3.48E−29
58.8402	0.3518	3.26E−30	1.31E−29	1.38E−29	1.41E−29	2.36E−29	2.50E−29
58.9402	0.5261	2.23E−30	1.06E−29	1.19E−29	1.27E−29	1.93E−29	2.07E−29
59.0402	0.7001	1.40E−30	8.07E−30	9.82E−30	1.11E−29	1.50E−29	1.88E−29
59.1402	0.8739	8.76E−31	6.05E−30	7.87E−30	9.33E−30	1.20E−29	1.69E−29

TABLE 3. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (nonrelativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90°—Continued

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
			Au $K\alpha$: 68.18 keV				
59.6952	−0.7861	1.06E−30	6.70E−30	8.47E−30	9.81E−30	1.28E−29	1.72E−29
59.7952	0.6143	1.71E−30	8.95E−30	1.05E−29	1.15E−29	1.64E−29	1.89E−29
59.8952	0.4428	2.62E−30	1.15E−29	1.24E−29	1.30E−29	2.07E−29	2.14E−29
59.9952	0.2714	3.60E−30	1.37E−29	1.39E−29	1.40E−29	2.44E−29	2.79E−29
60.0952	0.1668	4.11E−30	1.46E−29	1.45E−29	1.44E−29	2.60E−29	3.43E−29
60.1952							
60.2952	+0.1727	4.10E−30	1.46E−29	1.45E−29	1.45E−29	2.60E−29	3.41E−29
60.3952	0.3432	3.21E−30	1.29E−29	1.34E−29	1.37E−29	2.31E−29	2.45E−29
60.4952	0.5133	2.23E−30	1.05E−29	1.17E−29	1.25E−29	1.90E−29	2.02E−29
60.5952	0.6832	1.43E−30	8.08E−30	9.74E−30	1.09E−29	1.50E−29	1.90E−29
60.6952	0.8528	8.97E−31	6.07E−30	7.84E−30	9.25E−30	1.19E−29	1.66E−29
			Am-241: 59.54 keV				
44.6951	−18.4206		5.42E−34	2.17E−32	2.27E−32	4.77E−32	1.02E−31
45.6951	16.2433		3.30E−33	6.04E−33	1.59E−32	7.36E−32	1.50E−31
46.6951	14.0988		7.79E−33	1.39E−32	2.23E−32	1.25E−31	2.39E−31
47.6951	11.9872		1.69E−32	2.99E−32	4.57E−32	2.17E−31	3.88E−31
48.6951	9.9084		4.51E−32	7.31E−32	7.20E−32	3.12E−31	7.06E−31
49.6951	7.8622		7.46E−32	1.16E−31	1.62E−31	5.51E−31	9.70E−31
50.6951	7.5485		2.14E−31	2.95E−31	3.75E−31	1.10E−30	1.83E−30
51.6951	3.8670	1.07E−32	6.30E−31	7.55E−31	8.90E−31	2.66E−30	3.46E−30
52.6951	1.9176	5.02E−32	1.82E−30	2.32E−30	3.10E−30	6.44E−30	7.80E−30
53.6951							
54.6951	+1.8861	5.62E−32	1.89E−30	2.44E−30	3.24E−30	6.60E−30	8.10E−30
55.6951	3.7411	1.65E−32	7.01E−31	8.36E−31	9.88E−31	2.94E−30	3.73E−30
56.6951	5.5651		2.69E−31	3.00E−31	4.49E−31	1.32E−30	2.07E−30
57.6951	7.3587		1.04E−31	1.60E−31	2.18E−31	8.45E−31	1.23E−30

TABLE 4. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90° (a.u. = atomic units)

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
			Mo $K\alpha$: 17.44 keV				
16.3644	−2.9622	1.76E−32	3.61E−30	4.20E−30	5.00E−30	1.47E−29	1.66E−29
16.4644	2.3630	6.66E−32	4.98E−30	5.97E−30	7.50E−30	1.93E−29	2.13E−29
16.5644	1.9673	1.59E−31	6.31E−30	8.02E−30	1.06E−29	2.27E−29	2.69E−29
16.6644	1.1749	1.39E−30	1.44E−29	2.04E−29	2.60E−29	3.40E−29	5.29E−29
16.7644	0.5858	7.60E−30	3.86E−29	4.43E−29	4.83E−29	7.01E−29	7.89E−29
16.8644							
16.9644	+0.5821	7.71E−30	3.91E−29	4.47E−29	4.87E−29	7.09E−29	7.95E−29
17.0644	1.1611	1.47E−30	1.49E−29	2.08E−29	2.65E−29	3.47E−29	5.42E−29
17.1644	1.7368	2.95E−30	7.68E−30	1.02E−29	1.37E−29	2.54E−29	3.29E−29
17.2644	2.3091	8.12E−32	5.26E−30	6.36E−30	8.09E−30	2.02E−29	2.25E−29
17.3644	2.8782	1.61E−31	3.91E−30	4.56E−30	5.51E−30	1.58E−29	1.76E−29
			Ag $K\alpha$: 22.10 keV				
20.6838	−2.3612	5.41E−32	3.92E−30	4.70E−30	5.92E−30	1.52E−29	1.67E−29
20.7838	1.8846	1.56E−31	5.28E−30	6.83E−30	9.07E−30	1.85E−29	2.26E−29
20.8838	1.4103	5.39E−31	8.20E−30	1.15E−29	1.54E−29	2.28E−29	3.37E−29
20.9838	0.9381	2.26E−30	1.68E−29	2.21E−29	2.71E−29	3.43E−29	5.04E−29
21.0838	0.4681	8.00E−30	3.69E−29	3.92E−29	4.13E−29	6.49E−29	6.76E−29
21.1838							
21.2838	+0.4657	8.11E−30	3.60E−29	3.95E−29	4.15E−29	6.55E−29	6.82E−29
21.3838	0.9214	2.40E−30	1.75E−29	2.30E−29	2.78E−29	3.45E−29	5.14E−29
21.4838	1.3910	5.77E−31	8.51E−30	1.19E−29	1.59E−29	2.33E−29	3.46E−29
21.5838	1.8505	1.70E−31	5.49E−30	7.15E−30	9.51E−30	1.90E−29	2.35E−29
21.6838	2.3079	6.38E−32	4.13E−30	5.00E−30	6.35E−30	1.59E−29	1.77E−29
			Cd $K\alpha$: 23.10 keV				
21.601	−2.2635	6.62E−32	3.98E−30	4.85E−30	6.21E−30	1.52E−29	1.70E−29
21.701	1.8068	1.77E−31	5.33E−30	7.00E−30	9.32E−30	1.82E−29	2.29E−29
21.801	1.3520	6.29E−31	8.53E−30	1.20E−29	1.58E−29	2.26E−29	3.40E−29
21.901	0.8993	2.43E−30	1.73E−29	2.26E−29	2.70E−29	3.43E−29	4.94E−29
22.001	0.4583	7.81E−30	3.47E−29	3.78E−29	3.97E−29	6.27E−29	6.52E−29
22.101							
22.201	+0.4473	8.05E−30	3.53E−29	3.83E−29	4.01E−29	6.38E−29	6.56E−29
22.301	0.8923	2.50E−30	1.75E−29	2.30E−29	2.74E−29	3.49E−29	5.00E−29
22.401	1.3354	6.73E−31	8.84E−30	1.24E−29	1.63E−29	2.31E−29	3.50E−29
22.501	1.7765	1.99E−31	5.57E−30	7.36E−30	9.82E−30	1.88E−29	2.39E−29
22.601	2.2158	7.58E−32	4.18E−30	5.13E−30	6.60E−30	1.58E−29	1.78E−29
			In $K\alpha$: 24.14 keV				
22.5159	−2.1678	7.88E−32	4.03E−30	4.97E−30	6.45E−30	1.51E−29	1.72E−29
22.6159	1.7299	2.13E−31	5.46E−30	7.29E−30	9.75E−30	1.80E−29	2.34E−29
22.7159	1.2938	7.21E−31	8.83E−30	1.24E−29	1.62E−29	2.24E−29	3.43E−29
22.8159	0.8595	2.58E−30	1.76E−29	2.28E−29	2.70E−29	3.45E−29	4.85E−29
22.9159	0.4270	7.99E−30	3.45E−29	3.71E−29	3.86E−29	6.22E−29	6.42E−29
23.0159							
23.1159	+0.4325	7.95E−30	3.44E−29	3.71E−29	3.87E−29	6.21E−29	6.42E−29
23.2159	0.8597	2.60E−30	1.77E−29	2.29E−29	2.72E−29	3.48E−29	4.90E−29
23.3159	1.2851	7.43E−31	9.04E−30	1.27E−29	1.65E−29	2.28E−29	3.50E−29
23.4159	1.7087	2.29E−31	5.65E−30	7.59E−30	1.01E−29	1.84E−29	2.42E−29
23.5159	2.1306	8.66E−32	4.19E−30	5.21E−30	6.77E−30	1.56E−29	1.81E−29
			Sn $K\alpha$: 25.20 keV				
23.516	−2.0839	8.73E−32	4.04E−30	5.06E−30	6.60E−30	1.49E−29	1.72E−29
23.616	1.6636	2.43E−31	5.55E−30	7.50E−30	1.01E−29	1.77E−29	2.37E−29
23.716	1.2448	7.81E−31	9.02E−30	1.27E−29	1.64E−29	2.21E−29	3.43E−29
23.816	0.8278	2.67E−30	1.77E−29	2.27E−29	2.66E−29	3.44E−29	4.74E−29
23.916	0.4124	7.89E−30	3.36E−29	3.59E−29	3.73E−29	6.07E−29	6.24E−29
24.016							
24.116	+0.4135	7.92E−30	3.37E−29	3.61E−29	3.74E−29	6.08E−29	6.25E−29
24.216	0.8240	2.72E−30	1.79E−29	2.30E−29	2.69E−29	3.47E−29	4.79E−29
24.316	1.2329	8.11E−31	9.22E−30	1.30E−29	1.68E−29	2.24E−29	3.49E−29
24.416	1.6401	2.59E−31	5.73E−30	7.77E−30	1.04E−29	1.81E−29	2.45E−29
24.516	2.0458	9.49E−32	4.21E−30	5.27E−30	6.92E−30	1.54E−29	1.79E−29
			Cs $K\alpha$: 30.85 keV				
28.5936	−1.7267	1.65E−31	4.25E−30	7.57E−30	5.66E−30	1.40E−29	1.83E−29
28.6936	1.3791	4.32E−31	6.13E−30	1.14E−29	8.56E−30	1.66E−29	2.47E−29
28.7936	1.0326	1.19E−30	1.02E−29	1.73E−29	1.39E−29	2.17E−29	3.34E−29

TABLE 4. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90° (a.u. = atomic units)—Continued

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
28.8936	0.6873	3.23E−30	1.83E−29	2.48E−29	2.21E−29	3.39E−29	4.19E−29
28.9936	0.3430	7.34E−30	2.94E−29	3.14E−29	3.07E−29	5.29E−29	5.62E−29
29.0936							
29.1936	+0.3421	7.42E−30	2.95E−29	3.15E−29	3.08E−29	5.33E−29	5.67E−29
29.2936	0.6831	3.28E−30	1.85E−29	2.51E−29	2.23E−29	3.43E−29	5.44E−29
29.3936	1.0228	1.22E−30	1.04E−29	1.76E−29	1.42E−29	2.21E−29	3.39E−29
29.4936	1.3616	4.61E−31	6.35E−30	1.18E−29	8.87E−30	1.69E−29	2.54E−29
29.5936	1.6992	1.81E−31	4.43E−30	7.96E−30	5.95E−30	1.44E−29	1.89E−29
			Ba $K\alpha$: 32.06 keV				
29.6684	−1.6629	1.90E−31	4.34E−30	5.86E−30	7.86E−30	1.38E−29	1.85E−29
29.7684	1.3276	4.90E−31	6.34E−30	8.90E−30	1.16E−29	1.64E−29	2.49E−29
29.8684	0.9932	1.26E−30	1.04E−29	1.41E−29	1.73E−29	2.17E−29	3.31E−29
29.9684	0.6599	3.36E−30	1.86E−29	2.20E−29	2.44E−29	3.40E−29	4.09E−29
30.0684	0.3276	7.29E−30	2.88E−29	2.99E−29	3.04E−29	5.17E−29	5.55E−29
30.1684							
30.2684	+0.3338	7.21E−30	2.87E−29	2.98E−29	3.04E−29	5.15E−29	5.51E−29
30.3684	0.6629	3.35E−30	1.84E−29	2.20E−29	2.45E−29	3.40E−29	4.10E−29
30.4684	0.9911	1.28E−30	1.05E−29	1.42E−29	1.75E−29	2.19E−29	3.34E−29
30.5684	1.3182	5.06E−31	6.47E−30	9.09E−30	1.19E−29	1.67E−29	2.54E−29
30.6684	1.6444	2.01E−31	4.46E−30	6.06E−30	8.11E−30	1.40E−29	1.90E−29
			La $K\alpha$: 33.30 keV				
30.7617	−1.6128	2.04E−31	4.35E−30	5.93E−30	7.97E−30	1.35E−29	1.86E−29
30.8617	1.2889	5.26E−31	6.40E−30	9.00E−30	1.17E−29	1.62E−29	2.48E−29
30.9617	0.9660	1.35E−30	1.06E−29	1.41E−29	1.72E−29	2.17E−29	3.24E−29
31.0617	0.6441	3.38E−30	1.83E−29	2.15E−29	2.39E−29	3.35E−29	3.96E−29
31.1617	0.3232	7.05E−30	2.78E−29	2.88E−29	2.93E−29	5.00E−29	5.37E−29
31.2617							
31.3617	+0.3157	7.18E−30	2.81E−29	2.90E−29	2.95E−29	5.04E−29	5.45E−29
31.4617	0.6338	3.48E−30	1.86E−29	2.19E−29	2.42E−29	3.41E−29	4.00E−29
31.5617	0.9509	1.43E−30	1.10E−29	1.46E−29	1.77E−29	2.23E−29	3.31E−29
31.6617	1.2670	5.63E−31	6.67E−30	9.32E−30	1.22E−29	1.66E−29	2.56E−29
31.7617	1.5882	2.21E−31	4.52E−30	6.18E−30	8.29E−30	1.39E−29	1.92E−29
			Ce $K\alpha$: 34.57 keV				
31.878	−1.5598	2.32E−31	4.44E−30	6.10E−30	8.18E−30	1.34E−29	1.87E−29
31.978	1.2469	5.63E−31	6.51E−30	9.16E−30	1.18E−29	1.60E−29	2.48E−29
32.078	0.9350	1.44E−30	1.07E−29	1.43E−29	1.72E−29	2.17E−29	3.19E−29
32.178	0.6239	3.43E−30	1.81E−29	2.12E−29	2.33E−29	3.32E−29	3.85E−29
32.278	0.3138	6.91E−30	2.70E−29	2.79E−29	2.83E−29	4.85E−29	5.24E−29
32.378							
32.478	+0.3038	7.02E−30	2.74E−29	2.82E−29	2.85E−29	4.91E−29	5.34E−29
32.578	0.6113	3.54E−30	1.85E−29	2.16E−29	2.37E−29	3.39E−29	3.90E−29
32.678	0.9179	1.53E−30	1.12E−29	1.47E−29	1.77E−29	2.24E−29	3.26E−29
32.778	1.2236	6.01E−31	6.77E−30	9.53E−30	1.23E−29	1.64E−29	2.56E−29
32.878	1.5284	2.59E−31	4.66E−30	6.43E−30	8.61E−30	1.38E−29	1.95E−29
			Pr $K\alpha$: 35.86 keV				
33.0057	−1.5125	2.58E−31	4.52E−30	6.25E−30	8.35E−30	1.32E−29	1.88E−29
33.1057	1.2101	5.90E−31	6.55E−30	9.22E−30	1.19E−29	1.57E−29	2.47E−29
33.2057	0.9084	1.51E−30	1.08E−29	1.42E−29	1.71E−29	2.17E−29	3.13E−29
33.3057	0.6075	3.43E−30	1.78E−29	2.08E−29	2.28E−29	3.27E−29	3.74E−29
33.4057	0.3075	6.72E−30	2.62E−29	2.70E−29	2.73E−29	4.69E−29	5.10E−29
33.5057							
33.6057	+0.2899	6.91E−30	2.66E−29	2.73E−29	2.76E−29	4.77E−29	5.28E−29
33.7057	0.5875	3.65E−30	1.85E−29	2.14E−29	2.33E−29	3.38E−29	3.80E−29
33.8057	0.8841	1.63E−30	1.14E−29	1.48E−29	1.76E−29	2.25E−29	3.21E−29
33.9057	1.1800	6.61E−31	6.93E−30	9.75E−30	1.24E−29	1.63E−29	2.55E−29
34.0057	1.4809	2.82E−31	4.73E−30	6.57E−30	8.77E−30	1.36E−29	1.96E−29
			Sm $K\alpha$: 39.92 keV				
36.5187	−1.3653	3.46E−31	4.79E−30	6.73E−30	8.88E−30	1.28E−29	1.87E−29
36.6187	1.0909	7.46E−31	7.06E−30	9.92E−30	1.24E−29	1.58E−29	2.43E−29
36.7187	0.8172	1.72E−30	1.12E−29	1.44E−29	1.68E−29	2.17E−29	2.99E−29
36.8187	0.5442	3.54E−30	1.71E−29	1.94E−29	2.08E−29	3.11E−29	3.39E−29
36.9187	0.2719	6.36E−30	2.41E−29	2.46E−29	2.48E−29	4.32E−29	4.91E−29
37.0187							
37.1187	+0.2708	6.41E−30	2.41E−29	2.47E−29	2.48E−29	4.34E−29	4.97E−29

TABLE 4. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90° (a.u. = atomic units)—Continued

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
37.2187	0.5411	3.69E−30	1.78E−29	2.01E−29	2.16E−29	3.24E−29	3.51E−29
37.3187	0.8108	1.75E−30	1.14E−29	1.46E−29	1.70E−29	2.20E−29	3.02E−29
37.4187	1.0797	8.13E−31	7.34E−30	1.01E−29	1.27E−29	1.61E−29	2.49E−29
37.5187	1.3480	3.78E−31	4.96E−30	6.96E−30	9.16E−30	1.31E−29	1.97E−29
			Gd $K\alpha$: 42.76 keV				
38.9574	−1.2853	4.10E−31	4.98E−30	7.00E−30	9.12E−30	1.26E−29	1.93E−29
39.0574	1.0274	8.63E−31	7.33E−30	1.00E−29	1.24E−29	1.56E−29	2.39E−29
39.1574	0.7706	1.82E−30	1.13E−29	1.42E−29	1.64E−29	2.15E−29	2.86E−29
39.2574	0.5135	3.65E−30	1.72E−29	1.91E−29	2.04E−29	3.11E−29	3.31E−29
39.3574	0.2575	6.05E−30	2.27E−29	2.31E−29	2.32E−29	4.06E−29	4.73E−29
39.4574							
39.5574	+0.2528	6.11E−30	2.29E−29	2.32E−29	2.33E−29	4.08E−29	4.78E−29
39.6574	0.5072	3.72E−30	1.74E−29	1.94E−29	2.06E−29	3.15E−29	3.33E−29
39.7574	0.7609	1.89E−30	1.16E−29	1.45E−29	1.67E−29	2.20E−29	2.89E−29
39.8574	1.0139	8.95E−31	7.53E−30	1.03E−29	1.24E−29	1.59E−29	2.44E−29
39.9574	1.2664	4.35E−31	5.16E−30	7.25E−30	9.41E−30	1.28E−29	1.98E−29
			Dy $K\alpha$: 45.72 keV				
41.4642	−1.2118	4.55E−31	5.06E−30	7.12E−30	9.25E−30	1.23E−29	1.91E−29
41.5642	0.9688	9.66E−31	7.54E−30	1.02E−29	1.24E−29	1.56E−29	2.34E−29
41.6642	0.7265	1.93E−30	1.15E−29	1.40E−29	1.60E−29	2.14E−29	2.74E−29
41.7642	0.4847	3.65E−30	1.67E−29	1.84E−29	1.94E−29	3.02E−29	3.16E−29
41.8642	0.2434	5.77E−30	2.14E−29	2.17E−29	2.17E−29	3.83E−29	4.53E−29
41.9642							
42.0642	+0.2376	5.82E−30	2.16E−29	2.18E−29	2.18E−29	3.85E−29	4.60E−29
42.1642	0.4773	3.72E−30	1.69E−29	1.85E−29	1.96E−29	3.06E−29	3.20E−29
42.2642	0.7165	2.00E−30	1.17E−29	1.43E−29	1.62E−29	2.19E−29	2.77E−29
42.3642	0.9552	1.02E−30	7.80E−30	1.04E−29	1.27E−29	1.60E−29	2.38E−29
42.4642	1.1934	4.87E−31	5.28E−30	7.42E−30	9.52E−30	1.25E−29	1.96E−29
			Er $K\alpha$: 48.81 keV				
44.055	−1.1395	5.51E−31	5.39E−30	7.47E−30	9.56E−30	1.23E−29	1.91E−29
44.155	0.9104	1.09E−30	7.86E−30	1.03E−29	1.24E−29	1.58E−29	2.28E−29
44.255	0.6816	2.05E−30	1.15E−29	1.37E−29	1.56E−29	2.14E−29	2.62E−29
44.355	0.4534	3.67E−30	1.62E−29	1.76E−29	1.85E−29	2.93E−29	3.04E−29
44.455	0.2256	5.52E−30	2.03E−29	2.03E−29	2.04E−29	3.62E−29	4.39E−29
44.555							
44.655	+0.2286	5.51E−30	2.03E−29	2.04E−29	2.04E−29	3.62E−29	4.38E−29
44.755	0.4550	3.68E−30	1.63E−29	1.77E−29	1.85E−29	2.93E−29	3.05E−29
44.855	0.6809	2.07E−30	1.16E−29	1.40E−29	1.57E−29	2.15E−29	2.64E−29
44.955	0.9064	1.11E−30	7.98E−30	1.05E−29	1.25E−29	1.60E−29	2.30E−29
45.055	1.1314	5.68E−31	5.50E−30	7.64E−30	9.66E−30	1.25E−29	2.70E−29
			Yb $K\alpha$: 52.02 keV				
46.7136	−1.0796	6.16E−31	5.56E−30	7.63E−30	9.57E−30	1.22E−29	1.88E−29
46.8136	0.8628	1.17E−30	7.98E−30	1.03E−29	1.22E−29	1.57E−29	2.21E−29
46.9136	0.6465	2.12E−30	1.15E−29	1.36E−29	1.51E−29	2.11E−29	2.50E−29
47.0136	0.4306	3.62E−30	1.56E−29	1.69E−29	1.75E−29	2.82E−29	2.91E−29
47.1136	0.2151	5.18E−30	1.91E−29	1.92E−29	1.92E−29	3.41E−29	4.20E−29
47.2136							
47.3136	+0.2145	5.25E−30	1.92E−29	1.93E−29	1.92E−29	3.42E−29	4.22E−29
47.4136	0.4288	3.69E−30	1.58E−29	1.70E−29	1.77E−29	2.84E−29	2.94E−29
47.5136	0.6426	2.15E−30	1.16E−29	1.37E−29	1.52E−29	2.13E−29	2.52E−29
47.6136	0.8561	1.20E−30	8.12E−30	1.05E−29	1.24E−29	1.58E−29	2.23E−29
47.7136	1.0691	6.37E−31	5.68E−30	7.77E−30	9.75E−30	1.24E−29	1.87E−29
			Pt $K\alpha$: 66.24 keV				
58.1402	−0.8754	8.81E−31	6.09E−30	7.92E−30	9.38E−30	1.20E−29	1.71E−29
58.2402	0.6993	1.42E−30	8.17E−30	9.93E−30	1.11E−29	1.52E−29	1.90E−29
58.3402	0.5235	2.27E−30	1.08E−29	1.21E−29	1.29E−29	1.96E−29	2.09E−29
58.4402	0.3478	3.32E−30	1.33E−29	1.39E−29	1.42E−29	2.40E−29	2.54E−29
58.5402	0.1725	4.28E−30	1.53E−29	1.52E−29	1.51E−29	2.72E−29	3.57E−29
58.6402							
58.7402	+0.1773	4.27E−30	1.53E−29	1.52E−29	1.51E−29	2.71E−29	3.53E−29
58.8402	0.3518	3.31E−30	1.33E−29	1.40E−29	1.43E−29	2.40E−29	2.54E−29
58.9402	0.5261	2.27E−30	1.08E−29	1.21E−29	1.28E−29	1.96E−29	2.10E−29
59.0402	0.7001	1.42E−30	8.17E−30	9.95E−30	1.12E−29	1.52E−29	1.90E−29
59.1402	0.8739	8.87E−31	6.13E−30	7.97E−30	9.45E−30	1.21E−29	1.71E−29

TABLE 4. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for single atoms in the atomic region $1 \leqslant Z \leqslant 20$; energy interval: 0.1 keV; scattering angle (θ) = 90° (a.u. = atomic units)—Continued

Energy (keV)	P_Z (a.u.)	H	C	N	O	P	Ca
			Au $K\alpha$: 68.18 keV				
59.6952	−0.7861	1.08E−30	6.82E−30	8.62E−30	9.99E−30	1.30E−29	1.75E−29
59.7952	0.6143	1.74E−30	9.10E−30	1.06E−29	1.17E−29	1.67E−29	1.92E−29
59.8952	0.4428	2.67E−30	1.17E−29	1.26E−29	1.32E−29	2.11E−29	2.18E−29
59.9952	0.2714	3.66E−30	1.39E−29	1.42E−29	1.43E−29	2.48E−29	2.83E−29
60.0952	0.1668	4.18E−30	1.49E−29	1.48E−29	1.47E−29	2.64E−29	3.48E−29
60.1952							
60.2952	+0.1727	4.16E−30	1.48E−29	1.48E−29	1.47E−29	2.64E−29	3.46E−29
60.3952	0.3432	3.26E−30	1.30E−29	1.36E−29	1.39E−29	2.34E−29	2.49E−29
60.4952	0.5133	2.26E−30	1.06E−29	1.19E−29	1.27E−29	1.93E−29	2.05E−29
60.5952	0.6832	1.45E−30	8.20E−30	9.88E−30	1.11E−29	1.52E−29	1.93E−29
60.6952	0.8528	9.10E−31	6.15E−30	7.95E−30	9.38E−30	1.20E−29	1.69E−29
			Am-241: 59.54 keV				
44.6951	−18.4206		5.89E−34	2.36E−32	2.47E−32	5.18E−32	1.11E−31
45.6951	16.2433		3.54E−33	6.49E−33	1.71E−32	7.91E−32	1.61E−31
46.6951	14.0988		8.29E−33	1.48E−32	2.37E−32	1.33E−31	2.54E−31
47.6951	11.9872		1.78E−32	3.15E−32	4.81E−32	2.28E−31	4.09E−31
48.6951	9.9084		4.71E−32	7.63E−32	7.51E−32	3.26E−31	7.37E−31
49.6951	7.8622		7.72E−32	1.20E−31	1.68E−31	5.71E−31	1.00E−30
50.6951	7.5485		2.20E−31	3.03E−31	3.86E−31	1.13E−30	1.88E−30
51.6951	3.8672	1.09E−32	6.44E−31	7.72E−31	9.10E−31	2.72E−30	3.54E−30
52.6951	1.9176	5.11E−32	1.85E−30	2.36E−30	3.16E−30	6.55E−30	7.93E−30
53.6951							
54.6951	+1.8861	5.73E−32	1.92E−30	2.49E−30	3.30E−30	6.73E−30	8.25E−30
55.6951	3.7411	1.67E−32	7.12E−31	8.49E−31	1.00E−30	2.99E−30	3.79E−30
56.6951	5.5651		2.72E−31	3.04E−31	4.55E−31	1.33E−30	2.10E−30
57.6951	7.3587		1.04E−31	1.60E−31	2.18E−31	8.46E−31	1.23E−30

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ) = 90°; X = scattering cross section

Water–H_2O

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	5.04E−30	20.6838	6.03E−30	21.601	6.34E−30	22.5159	6.60E−30	23.516	6.78E−30
16.4644	7.64E−30	20.7838	9.38E−30	21.701	9.68E−30	22.6159	1.02E−29	23.616	1.05E−29
16.5644	1.09E−29	20.8838	1.64E−29	21.801	1.70E−29	22.7159	1.76E−29	23.716	1.80E−29
16.6644	2.88E−29	20.9838	3.16E−29	21.901	3.19E−29	22.8159	3.21E−29	23.816	3.19E−29
16.7644	6.35E−29	21.0838	5.73E−29	22.001	5.53E−29	22.9159	5.46E−29	23.916	5.30E−29
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	6.41E−29	21.2838	5.78E−29	22.201	5.62E−29	23.1159	5.46E−29	24.116	5.32E−29
17.0644	2.95E−29	21.3838	3.26E−29	22.301	3.24E−29	23.2159	3.24E−29	24.216	3.24E−29
17.1644	1.96E−29	21.4838	1.70E−29	22.401	1.77E−29	23.3159	1.80E−29	24.316	1.84E−29
17.2644	8.25E−30	21.5838	9.85E−30	22.501	1.02E−29	23.4159	1.06E−29	24.416	1.09E−29
17.3644	5.83E−30	21.6838	6.48E−30	22.601	6.75E−30	23.5159	6.94E−30	24.516	7.11E−30

Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	7.90E−30	29.6684	8.24E−30	30.7617	8.38E−30	31.878	8.64E−30	33.0057	8.87E−30
28.6936	1.22E−29	29.7684	1.26E−29	30.8617	1.28E−29	31.978	1.30E−29	33.1057	1.31E−29
28.7936	1.96E−29	29.8684	1.99E−29	30.9617	1.99E−29	32.078	2.01E−29	33.2057	2.01E−29
28.8936	3.13E−29	29.9684	3.12E−29	31.0617	3.06E−29	32.178	3.02E−29	33.3057	2.97E−29
28.9936	4.60E−29	30.0684	4.50E−29	31.1617	4.34E−29	32.278	4.21E−29	33.4057	4.08E−29
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	4.63E−29	30.2684	4.48E−29	31.3617	4.38E−29	32.478	4.25E−29	33.6057	4.14E−29
29.2936	3.16E−29	30.3684	3.12E−29	31.4617	3.11E−29	32.578	3.08E−29	33.7057	3.06E−29
29.3936	2.00E−29	30.4684	2.01E−29	31.5617	2.05E−29	32.678	2.07E−29	33.8057	2.09E−29
29.4936	1.27E−29	30.5684	1.29E−29	31.6617	1.33E−29	32.778	1.35E−29	33.9057	1.37E−29
29.5936	8.32E−30	30.6684	8.51E−30	31.7617	8.74E−30	32.878	9.12E−30	34.0057	9.33E−30

Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	9.57E−30	38.9574	9.94E−30	41.4642	1.02E−29	44.055	1.07E−29	46.7136	1.08E−29
36.6187	1.39E−29	39.0574	1.41E−29	41.5642	1.43E−29	44.155	1.46E−29	46.8136	1.46E−29
36.7187	2.03E−29	39.1574	2.00E−29	41.6642	1.99E−29	44.255	1.97E−29	46.9136	1.93E−29
36.8187	2.79E−29	39.2574	2.77E−29	41.7642	2.67E−29	44.355	2.58E−29	47.0136	2.48E−29
36.9187	3.75E−29	39.3574	3.53E−29	41.8642	3.33E−29	44.455	3.15E−29	47.1136	2.95E−29
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	3.76E−29	39.5574	3.55E−29	42.0642	3.34E−29	44.655	3.15E−29	47.3136	2.97E−29
37.2187	2.90E−29	39.6574	2.80E−29	42.1642	2.70E−29	44.755	2.59E−29	47.4136	2.50E−29
37.3187	2.05E−29	39.7574	2.04E−29	42.2642	2.02E−29	44.855	1.98E−29	47.5136	1.95E−29
37.4187	1.43E−29	39.8574	1.42E−29	42.3642	1.47E−29	44.955	1.48E−29	47.6136	1.48E−29
37.5187	9.92E−30	39.9574	9.78E−30	42.4642	1.05E−29	45.055	1.08E−29	47.7136	1.10E−29

Pt$K\alpha$	X	Au $K\alpha$	X	Am-241	X
58.1402	1.11E−29	59.6952	1.21E−29	44.6951	2.47E−32
58.2402	1.40E−29	59.7952	1.52E−29	45.6951	1.71E−32
58.3402	1.74E−29	59.8952	1.85E−29	46.6951	2.37E−32
58.4402	2.09E−29	59.9952	2.16E−29	47.6951	4.81E−32
58.5402	2.37E−29	60.0952	2.30E−29	48.6951	7.51E−32
58.6402		60.1952		49.6951	1.68E−31
58.7402	2.36E−29	60.2952	2.30E−29	50.6951	3.86E−31
58.8402	2.09E−29	60.3952	2.04E−29	51.6951	9.32E−31
58.9402	1.74E−29	60.4952	1.72E−29	52.6951	3.26E−30
59.0402	1.41E−29	60.5952	1.40E−29	53.6951	
59.1402	1.12E−29	60.6952	1.12E−29	54.6951	3.41E−30
				55.6951	1.04E−30
				56.6951	4.55E−31
				57.6951	2.18E−31

Bone–$H_8O_{26}P_9Ca_6$

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	3.62E−28	20.6838	3.92E−28	21.601	4.00E−28	22.5159	4.07E−28	23.516	4.10E−28
16.4644	4.97E−28	20.7838	5.39E−28	21.701	5.45E−28	22.6159	5.57E−28	23.616	5.64E−28
16.5644	6.42E−28	20.8838	8.11E−28	21.801	8.22E−28	22.7159	8.33E−28	23.716	8.38E−28
16.6644	1.31E−27	20.9838	1.33E−27	21.901	1.33E−27	22.8159	1.32E−27	23.816	1.31E−27
16.7644	2.42E−27	21.0838	2.13E−27	22.001	2.05E−27	22.9159	2.01E−27	23.916	1.95E−27
16.8644		21.1838		22.101		23.0159		24.016	

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ)=90°; X=scattering cross section—Continued

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.9644	2.44E−27	21.2838	2.14E−27	22.201	2.07E−27	23.1159	2.01E−27	24.116	1.96E−27
17.0644	1.34E−27	21.3838	1.36E−27	22.301	1.35E−27	23.2159	1.33E−27	24.216	1.32E−27
17.1644	8.05E−28	21.4838	8.34E−28	22.401	8.47E−28	23.3159	8.51E−28	24.316	8.54E−27
17.2644	5.28E−28	21.5838	5.61E−28	22.501	5.69E−28	23.4159	5.76E−28	24.416	5.83E−27
17.3644	3.92E−28	21.6838	4.14E−28	22.601	4.21E−28	23.5159	4.25E−28	24.516	4.27E−27
Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	4.34E−28	29.6684	4.41E−28	30.7617	4.42E−28	31.878	4.47E−28	33.0057	4.51E−28
28.6936	5.97E−28	29.7684	6.04E−28	30.8617	6.05E−28	31.978	6.05E−28	33.1057	6.03E−28
28.7936	8.54E−28	29.8684	8.55E−28	30.9617	8.49E−28	32.078	8.45E−28	33.2057	8.39E−28
28.8936	1.23E−27	29.9684	1.21E−27	31.0617	1.19E−27	32.178	1.16E−27	33.3057	1.14E−27
28.9936	1.69E−27	30.0684	1.65E−27	31.1617	1.59E−27	32.278	1.54E−27	33.4057	1.49E−27
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	1.70E−27	30.2684	1.64E−27	31.3617	1.60E−27	32.478	1.56E−27	33.6057	1.52E−27
29.2936	1.31E−27	30.3684	1.22E−27	31.4617	1.20E−27	32.578	1.18E−27	33.7057	1.17E−27
29.3936	8.68E−28	30.4684	8.63E−28	31.5617	8.70E−28	32.678	8.68E−28	33.8057	8.66E−28
29.4936	6.14E−28	30.5684	6.16E−28	31.6617	6.24E−28	32.778	6.25E−28	33.9057	6.28E−28
29.5936	4.51E−28	30.6684	4.53E−28	31.7617	4.57E−28	32.878	4.67E−28	34.0057	4.70E−28
Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	4.61E−28	38.9574	4.69E−28	41.4642	4.69E−28	44.055	4.78E−28	46.7136	4.76E−28
36.6187	6.15E−28	39.0574	6.14E−28	41.5642	6.11E−28	44.155	6.09E−28	46.8136	6.00E−28
36.7187	8.26E−28	39.1574	8.06E−28	41.6642	7.89E−28	44.255	7.71E−28	46.9136	7.48E−28
36.8187	1.05E−27	39.2574	1.04E−27	41.7642	9.95E−28	44.355	9.56E−28	47.0136	9.14E−28
36.9187	1.38E−27	39.3574	1.30E−27	41.8642	1.23E−27	44.455	1.16E−27	47.1136	1.10E−27
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	1.34E−27	39.5574	1.31E−27	42.0642	1.24E−27	44.655	1.16E−27	47.3136	1.10E−27
37.2187	1.09E−27	39.6574	1.05E−27	42.1642	1.01E−27	44.755	9.58E−28	47.4136	9.21E−28
37.3187	8.35E−28	39.7574	8.19E−28	42.2642	8.01E−28	44.855	7.77E−28	47.5136	7.55E−28
37.4187	6.30E−28	39.8574	6.19E−28	42.3642	6.25E−28	44.955	6.17E−28	47.6136	6.08E−28
37.5187	4.77E−28	39.9574	4.82E−28	42.4642	4.82E−28	45.055	5.30E−28	47.7136	4.82E−28
Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X				
58.1402	4.61E−28	59.6952	4.91E−28	44.6951	5.97E−30				
58.2402	5.51E−28	59.7952	5.84E−28	45.6951	2.12E−30				
58.3402	6.55E−28	59.8952	6.84E−28	46.6951	3.33E−30				
58.4402	7.65E−28	59.9952	7.94E−28	47.6951	5.76E−30				
58.5402	8.86E−28	60.0952	8.62E−28	48.6951	9.31E−30				
58.6402		60.1952		49.6951	1.55E−29				
58.7402	8.83E−28	60.2952	8.60E−28	50.6951	3.15E−29				
58.8402	7.65E−28	60.3952	7.48E−28	51.6951	6.95E−29				
58.9402	6.54E−28	60.4952	6.44E−28	52.6951	1.89E−28				
59.0402	5.54E−28	60.5952	5.52E−28	53.6951					
59.1402	4.65E−28	60.6952	4.61E−28	54.6951	1.96E−28				
				55.6951	7.58E−29				
				56.6951	3.64E−29				
				57.6951	2.07E−29				

Fat–$C_{55}H_{102}O_6$

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	2.30E−28	20.6838	2.56E−28	21.601	2.63E−28	22.5159	2.68E−28	23.516	2.71E−28
16.4644	3.26E−28	20.7838	3.61E−28	21.701	3.67E−28	22.6159	3.81E−28	23.616	3.90E−28
16.5644	4.27E−28	20.8838	5.98E−28	21.801	6.28E−28	22.7159	6.56E−28	23.716	6.74E−28
16.6644	1.09E−27	20.9838	1.32E−27	21.901	1.36E−27	22.8159	1.39E−27	23.816	1.41E−27
16.7644	3.19E−27	21.0838	3.10E−27	22.001	2.94E−27	22.9159	2.94E−27	23.916	2.87E−27
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	3.23E−27	21.2838	3.06E−27	22.201	3.00E−27	23.1159	2.93E−27	24.116	2.89E−27
17.0644	1.13E−27	21.3838	1.38E−27	22.301	1.38E−27	23.2159	1.40E−27	24.216	1.42E−27
17.1644	8.06E−28	21.4838	6.22E−28	22.401	6.53E−28	23.3159	6.72E−28	24.316	6.90E−28
17.2644	3.46E−28	21.5838	3.76E−28	22.501	3.85E−28	23.4159	3.95E−28	24.416	4.04E−28
17.3644	2.64E−28	21.6838	2.72E−28	22.601	2.77E−28	23.5159	2.80E−28	24.516	2.83E−28

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ) = 90°; X = scattering cross section—Continued

Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	2.96E−28	29.6684	3.05E−28	30.7617	3.08E−28	31.878	3.17E−28	33.0057	3.25E−28
28.6936	4.50E−28	29.7684	4.68E−28	30.8617	4.76E−28	31.978	4.87E−28	33.1057	4.92E−28
28.7936	7.85E−28	29.8684	8.02E−28	30.9617	8.26E−28	32.078	8.41E−28	33.2057	8.52E−28
28.8936	1.48E−27	29.9684	1.51E−27	31.0617	1.49E−27	32.178	1.48E−27	33.3057	1.47E−27
28.9936	2.56E−27	30.0684	2.51E−27	31.1617	2.43E−27	32.278	2.36E−27	33.4057	2.29E−27
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	2.57E−27	30.2684	2.50E−27	31.3617	2.45E−27	32.478	2.39E−27	33.6057	2.34E−27
29.2936	1.50E−27	30.3684	1.50E−27	31.4617	1.52E−27	32.578	1.52E−27	33.7057	1.53E−27
29.3936	8.01E−28	30.4684	8.13E−28	31.5617	8.55E−28	32.678	8.76E−28	33.8057	8.97E−28
29.4936	4.67E−28	30.5684	4.79E−28	31.6617	4.97E−28	32.778	5.08E−28	33.9057	5.23E−28
29.5936	3.10E−28	30.6684	3.14E−28	31.7617	3.21E−28	32.878	3.34E−28	34.0057	3.41E−28
Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	3.17E−28	38.9574	3.70E−28	41.4642	3.80E−28	44.055	4.10E−28	46.7136	4.26E−28
36.6187	4.63E−28	39.0574	5.65E−28	41.5642	5.88E−28	44.155	6.18E−28	46.8136	6.31E−28
36.7187	7.16E−28	39.1574	9.08E−28	41.6642	9.24E−28	44.255	9.37E−28	46.9136	9.37E−28
36.8187	1.07E−27	39.2574	1.44E−27	41.7642	1.40E−27	44.355	1.38E−27	47.0136	1.33E−27
36.9187	1.42E−27	39.3574	2.01E−27	41.8642	1.90E−27	44.455	1.80E−27	47.1136	1.70E−27
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	1.48E−27	39.5574	2.02E−27	42.0642	1.91E−27	44.655	1.80E−27	47.3136	1.71E−27
37.2187	1.11E−27	39.6574	1.46E−27	42.1642	1.42E−27	44.755	1.38E−27	47.4136	1.35E−27
37.3187	7.29E−28	39.7574	9.33E−28	42.2642	9.46E−28	44.855	9.46E−28	47.5136	9.49E−28
37.4187	4.80E−28	39.8574	5.80E−28	42.3642	6.09E−28	44.955	6.28E−28	47.6136	6.43E−28
37.5187	3.28E−28	39.9574	3.84E−28	42.4642	3.97E−28	45.055	4.18E−28	47.7136	4.36E−28
Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X				
58.1402	4.81E−28	59.6952	5.45E−28	44.6951	1.81E−31				
58.2402	6.61E−28	59.7952	7.48E−28	45.6951	2.97E−31				
58.3402	9.01E−28	59.8952	9.92E−28	46.6951	5.98E−31				
58.4402	1.16E−27	59.9952	1.22E−27	47.6951	1.27E−30				
58.5402	1.37E−27	60.0952	1.33E−27	48.6951	3.04E−30				
58.6402		60.1952		49.6951	5.26E−30				
58.7402	1.37E−27	60.2952	1.33E−27	50.6951	1.44E−29				
58.8402	1.15E−27	60.3952	1.13E−27	51.6951	4.20E−29				
58.9402	9.00E−28	60.4952	8.92E−28	52.6951	1.26E−28				
59.0402	6.61E−28	60.5952	6.65E−28	53.6951					
59.1402	4.84E−28	60.6952	4.88E−28	54.6951	1.31E−28				
				55.6951	4.69E−29				
				56.6951	1.77E−29				
				57.6951	7.06E−30				
Lucite–$C_5H_8O_2$									
Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	2.82E−29	20.6838	3.19E−29	21.601	3.29E−29	22.5159	3.37E−29	23.516	3.41E−29
16.4644	4.04E−29	20.7838	4.58E−29	21.701	4.67E−29	22.6159	4.85E−29	23.616	4.98E−29
16.5644	5.40E−29	20.8838	7.60E−29	21.801	7.92E−29	22.7159	8.23E−29	23.716	8.42E−29
16.6644	1.35E−28	20.9838	1.56E−28	21.901	1.60E−28	22.8159	1.62E−28	23.816	1.63E−28
16.7644	3.50E−28	21.0838	3.31E−28	22.001	3.15E−28	22.9159	3.13E−28	23.916	3.05E−28
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	3.54E−28	21.2838	3.28E−28	22.201	3.21E−28	23.1159	3.13E−28	24.116	3.07E−28
17.0644	1.39E−28	21.3838	1.63E−28	22.301	1.62E−28	23.2159	1.64E−28	24.216	1.65E−28
17.1644	8.94E−29	21.4838	7.89E−29	22.401	8.22E−29	23.3159	8.43E−29	24.316	8.61E−29
17.2644	4.31E−29	21.5838	4.78E−29	22.501	4.91E−29	23.4159	5.04E−29	24.416	5.16E−29
17.3644	3.18E−29	21.6838	3.39E−29	22.601	3.47E−29	23.5159	3.52E−29	24.516	3.56E−29
Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	3.77E−29	29.6684	3.89E−29	30.7617	3.93E−29	31.878	4.04E−29	33.0057	4.13E−29
28.6936	5.69E−29	29.7684	5.89E−29	30.8617	5.97E−29	31.978	6.07E−29	33.1057	6.12E−29
28.7936	9.49E−29	29.8684	9.66E−29	30.9617	9.84E−29	32.078	9.97E−29	33.2057	1.00E−28
28.8936	1.67E−28	29.9684	1.69E−28	31.0617	1.66E−28	32.178	1.64E−28	33.3057	1.62E−28
28.9936	2.69E−28	30.0684	2.63E−28	31.1617	2.54E−28	32.278	2.47E−28	33.4057	2.39E−28
29.0936		30.1684		31.2617		32.378		33.5057	

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ) = 90°; X = scattering cross section—Continued

Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
29.1936	2.70E−28	30.2684	2.62E−28	31.3617	2.57E−28	32.478	2.50E−28	33.6057	2.44E−28
29.2936	1.69E−28	30.3684	1.68E−28	31.4617	1.69E−28	32.578	1.68E−28	33.7057	1.68E−28
29.3936	9.68E−29	30.4684	9.78E−29	31.5617	1.02E−28	32.678	1.03E−28	33.8057	1.05E−28
29.4936	5.89E−29	30.5684	6.02E−29	31.6617	6.22E−29	32.778	6.32E−29	33.9057	6.48E−29
29.5936	3.95E−29	30.6684	4.01E−29	31.7617	4.09E−29	32.878	4.26E−29	34.0057	4.34E−29
Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	4.17E−29	38.9574	4.64E−29	41.4642	4.75E−29	44.055	5.05E−29	46.7136	5.19E−29
36.6187	6.01E−29	39.0574	6.84E−29	41.5642	7.03E−29	44.155	7.28E−29	46.8136	7.37E−29
36.7187	8.99E−29	39.1574	1.04E−28	41.6642	1.05E−28	44.255	1.05E−28	46.9136	1.04E−28
36.8187	1.29E−28	39.2574	1.56E−28	41.7642	1.51E−28	44.355	1.47E−28	47.0136	1.42E−28
36.9187	1.72E−28	39.3574	2.08E−28	41.8642	1.97E−28	44.455	1.86E−28	47.1136	1.75E−28
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	1.75E−28	39.5574	2.10E−28	42.0642	1.98E−28	44.655	1.86E−28	47.3136	1.76E−28
37.2187	1.34E−28	39.6574	1.58E−28	42.1642	1.53E−28	44.755	1.48E−28	47.4136	1.44E−28
37.3187	9.13E−29	39.7574	1.07E−28	42.2642	1.07E−28	44.855	1.06E−28	47.5136	1.06E−28
37.4187	6.21E−29	39.8574	6.96E−29	42.3642	7.25E−29	44.955	7.39E−29	47.6136	7.49E−29
37.5187	4.31E−29	39.9574	4.81E−29	42.4642	4.93E−29	45.055	5.14E−29	47.7136	5.30E−29
Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X				
58.1402	5.63E−29	59.6952	6.27E−29	44.6951	5.24E−32				
58.2402	7.44E−29	59.7952	8.28E−29	45.6951	5.19E−32				
58.3402	9.78E−29	59.8952	1.06E−28	46.6951	8.88E−32				
58.4402	1.22E−28	59.9952	1.27E−28	47.6951	1.85E−31				
58.5402	1.41E−28	60.0952	1.37E−28	48.6951	3.86E−31				
58.6402		60.1952		49.6951	7.23E−31				
58.7402	1.41E−28	60.2952	1.37E−28	50.6951	1.87E−30				
58.8402	1.22E−28	60.3952	1.19E−28	51.6951	5.13E−30				
58.9402	9.76E−29	60.4952	9.66E−29	52.6951	1.60E−29				
59.0402	7.46E−29	60.5952	7.47E−29	53.6951					
59.1402	5.66E−29	60.6952	5.68E−29	54.6951	1.67E−29				
				55.6951	5.70E−30				
				56.6951	2.27E−30				
				57.6951	9.59E−31				
Polycarbonate–$C_{16}H_{14}O_3$									
Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	7.31E−29	20.6838	8.12E−29	21.601	8.33E−29	22.5159	8.49E−29	23.516	8.56E−29
16.4644	1.03E−28	20.7838	1.14E−28	21.701	1.16E−28	22.6159	1.20E−28	23.616	1.22E−28
16.5644	1.35E−28	20.8838	1.85E−28	21.801	1.93E−28	22.7159	2.00E−28	23.716	2.04E−28
16.6644	3.28E−28	20.9838	3.82E−28	21.901	3.91E−28	22.8159	3.98E−28	23.816	4.01E−28
16.7644	8.69E−28	21.0838	8.27E−28	22.001	7.83E−28	22.9159	7.79E−28	23.916	7.59E−28
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	8.79E−28	21.2838	8.14E−28	22.201	7.98E−28	23.1159	7.78E−28	24.116	7.62E−28
17.0644	3.39E−28	21.3838	3.98E−28	22.301	3.98E−28	23.2159	4.01E−28	24.216	4.06E−28
17.1644	2.05E−28	21.4838	1.92E−28	22.401	2.00E−28	23.3159	2.05E−28	24.316	2.09E−28
17.2644	1.10E−28	21.5838	1.19E−28	22.501	1.21E−28	23.4159	1.24E−28	24.416	1.27E−28
17.3644	8.13E−29	21.6838	8.61E−29	22.601	8.77E−29	23.5159	8.86E−29	24.516	8.94E−29
Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	9.30E−29	29.6684	9.57E−29	30.7617	9.64E−29	31.878	9.88E−29	33.0057	1.01E−28
28.6936	1.38E−28	29.7684	1.43E−28	30.8617	1.45E−28	31.978	1.48E−28	33.1057	1.49E−28
28.7936	2.31E−28	29.8684	2.35E−28	30.9617	2.41E−28	32.078	2.44E−28	33.2057	2.46E−28
28.8936	4.12E−28	29.9684	4.17E−28	31.0617	4.11E−28	32.178	4.07E−28	33.3057	4.02E−28
28.9936	6.68E−28	30.0684	6.54E−28	31.1617	6.32E−28	32.278	6.14E−28	33.4057	5.95E−28
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	6.70E−28	30.2684	6.51E−28	31.3617	6.38E−28	32.478	6.22E−28	33.6057	6.06E−28
29.2936	4.17E−28	30.3684	4.16E−28	31.4617	4.19E−28	32.578	4.17E−28	33.7057	4.17E−28
29.3936	2.36E−28	30.4684	2.38E−28	31.5617	2.48E−28	32.678	2.53E−28	33.8057	2.58E−28
29.4936	1.43E−28	30.5684	1.46E−28	31.6617	1.51E−28	32.778	1.54E−28	33.9057	1.57E−28
29.5936	9.73E−29	30.6684	9.85E−29	31.7617	1.00E−28	32.878	1.04E−28	34.0057	1.06E−28

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ) = 90°; X = scattering cross section—Continued

Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	1.03E−28	38.9574	1.13E−28	41.4642	1.15E−28	44.055	1.23E−28	46.7136	1.26E−28
36.6187	1.50E−28	39.0574	1.67E−28	41.5642	1.71E−28	44.155	1.78E−28	46.8136	1.81E−28
36.7187	2.30E−28	39.1574	2.56E−28	41.6642	2.59E−28	44.255	2.60E−28	46.9136	2.58E−28
36.8187	3.38E−28	39.2574	3.87E−28	41.7642	3.76E−28	44.355	3.66E−28	47.0136	3.54E−28
36.9187	4.49E−28	39.3574	5.18E−28	41.8642	4.89E−28	44.455	4.63E−28	47.1136	4.36E−28
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	4.65E−28	39.5574	5.21E−28	42.0642	4.92E−28	44.655	4.63E−28	47.3136	4.38E−28
37.2187	3.51E−28	39.6574	3.92E−28	42.1642	3.81E−28	44.755	3.67E−28	47.4136	3.58E−28
37.3187	2.34E−28	39.7574	2.63E−28	42.2642	2.64E−28	44.855	2.62E−28	47.5136	2.61E−28
37.4187	1.56E−28	39.8574	1.70E−28	42.3642	1.77E−28	44.955	1.81E−28	47.6136	1.84E−28
37.5187	1.07E−28	39.9574	1.17E−28	42.4642	1.20E−28	45.055	1.25E−28	47.7136	1.29E−28

Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X
58.1402	1.38E−28	59.6952	1.54E−28	44.6951	8.36E−32
58.2402	1.84E−28	59.7952	2.05E−28	45.6951	1.08E−31
58.3402	2.43E−28	59.8952	2.63E−28	46.6951	2.04E−31
58.4402	3.03E−28	59.9952	3.16E−28	47.6951	4.29E−31
58.5402	3.50E−28	60.0952	3.40E−28	48.6951	9.79E−31
58.6402		60.1952		49.6951	1.74E−30
58.7402	3.50E−28	60.2952	3.40E−28	50.6951	4.68E−30
58.8402	3.02E−28	60.3952	2.96E−28	51.6951	1.32E−29
58.9402	2.43E−28	60.4952	2.40E−28	52.6951	3.98E−29
59.0402	1.84E−28	60.5952	1.85E−28	53.6951	
59.1402	1.39E−28	60.6952	1.39E−28	54.6951	4.14E−29
				55.6951	1.46E−29
				56.6951	5.72E−30
				57.6951	2.33E−30

Bakelite–$C_{43}H_{38}O_7$

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	1.91E−28	20.6838	2.12E−28	21.601	2.17E−28	22.5159	2.21E−28	23.516	2.23E−28
16.4644	2.69E−28	20.7838	2.96E−28	21.701	3.01E−28	22.6159	3.11E−28	23.616	3.18E−28
16.5644	3.52E−28	20.8838	4.81E−28	21.801	5.01E−28	22.7159	5.20E−28	23.716	5.32E−28
16.6644	8.53E−28	20.9838	9.97E−28	21.901	1.02E−27	22.8159	1.04E−27	23.816	1.05E−27
16.7644	2.29E−27	21.0838	2.18E−27	22.001	2.07E−27	22.9159	2.06E−27	23.916	2.00E−27
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	2.31E−27	21.2838	2.15E−27	22.201	2.11E−27	23.1159	2.05E−27	24.116	2.01E−27
17.0644	8.83E−28	21.3838	1.04E−27	22.301	1.04E−27	23.2159	1.05E−27	24.216	1.06E−27
17.1644	5.38E−28	21.4838	4.99E−28	22.401	5.20E−28	23.3159	5.33E−28	24.316	5.45E−28
17.2644	2.86E−28	21.5838	3.09E−28	22.501	3.16E−28	23.4159	3.23E−28	24.416	3.29E−28
17.3644	2.13E−28	21.6838	2.25E−28	22.601	2.29E−28	23.5159	2.31E−28	24.516	2.33E−28

Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	2.42E−28	29.6684	2.49E−28	30.7617	2.51E−28	31.878	2.57E−28	33.0057	2.62E−28
28.6936	3.60E−28	29.7684	3.73E−28	30.8617	3.77E−28	31.978	3.84E−28	33.1057	3.87E−28
28.7936	6.04E−28	29.8684	6.15E−28	30.9617	6.29E−28	32.078	6.37E−28	33.2057	6.43E−28
28.8936	1.08E−27	29.9684	1.10E−27	31.0617	1.08E−27	32.178	1.07E−27	33.3057	1.06E−27
28.9936	1.76E−27	30.0684	1.73E−27	31.1617	1.67E−27	32.278	1.62E−27	33.4057	1.57E−27
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	1.77E−27	30.2684	1.72E−27	31.3617	1.69E−27	32.478	1.64E−27	33.6057	1.60E−27
29.2936	1.10E−27	30.3684	1.09E−27	31.4617	1.10E−27	32.578	1.10E−27	33.7057	1.10E−27
29.3936	6.16E−28	30.4684	6.23E−28	31.5617	6.49E−28	32.678	6.61E−28	33.8057	6.74E−28
29.4936	3.73E−28	30.5684	3.81E−28	31.6617	3.93E−28	32.778	4.00E−28	33.9057	4.10E−28
29.5936	2.53E−28	30.6684	2.56E−28	31.7617	2.61E−28	32.878	2.70E−28	34.0057	2.75E−28

Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	2.68E−28	38.9574	2.94E−28	41.4642	3.00E−28	44.055	3.20E−28	46.7136	3.29E−28
36.6187	3.90E−28	39.0574	4.35E−28	41.5642	4.48E−28	44.155	4.66E−28	46.8136	4.73E−28
36.7187	5.99E−28	39.1574	6.71E−28	41.6642	6.78E−28	44.255	6.83E−28	46.9136	6.79E−28
36.8187	8.84E−28	39.2574	1.02E−27	41.7642	9.91E−28	44.355	9.66E−28	47.0136	9.33E−28
36.9187	1.20E−27	39.3574	1.37E−27	41.8642	1.29E−27	44.455	1.23E−27	47.1136	1.15E−27
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	1.22E−27	39.5574	1.38E−27	42.0642	1.30E−27	44.655	1.22E−27	47.3136	1.16E−27

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ) = 90°; X = scattering cross section—Continued

Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
37.2187	9.19E−28	39.6574	1.03E−27	42.1642	1.00E−27	44.755	9.69E−28	47.4136	9.45E−28
37.3187	6.09E−28	39.7574	6.89E−28	42.2642	6.93E−28	44.855	6.89E−28	47.5136	6.87E−28
37.4187	4.04E−28	39.8574	4.45E−28	42.3642	4.63E−28	44.955	4.73E−28	47.6136	4.81E−28
37.5187	2.77E−28	39.9574	3.04E−28	42.4642	3.12E−28	45.055	3.26E−28	47.7136	3.37E−28

Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X
58.1402	3.61E−28	59.6952	4.04E−28	44.6951	1.98E−31
58.2402	4.83E−28	59.7952	5.39E−28	45.6951	2.72E−31
58.3402	6.40E−28	59.8952	6.95E−28	46.6951	5.22E−31
58.4402	8.00E−28	59.9952	8.36E−28	47.6951	1.10E−30
58.5402	9.26E−28	60.0952	9.01E−28	48.6951	2.55E−30
58.6402		60.1952		49.6951	4.50E−30
58.7402	9.26E−28	60.2952	8.99E−28	50.6951	1.22E−29
58.8402	7.98E−28	60.3952	7.82E−28	51.6951	3.45E−29
58.9402	6.39E−28	60.4952	6.32E−28	52.6951	1.04E−28
59.0402	4.84E−28	60.5952	4.85E−28	53.6951	
59.1402	3.63E−28	60.6952	3.65E−28	54.6951	1.08E−28
				55.6951	3.83E−29
				56.6951	1.49E−29
				57.6951	6.02E−30

Nylon–$C_6H_{11}NO$

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	3.11E−29	20.6838	3.47E−29	21.601	3.57E−29	22.5159	3.65E−29	23.516	3.68E−29
16.4644	4.41E−29	20.7838	4.93E−29	21.701	5.02E−29	22.6159	5.22E−29	23.616	5.35E−29
16.5644	5.82E−29	20.8838	8.20E−29	21.801	8.58E−29	22.7159	8.95E−29	23.716	9.18E−29
16.6644	1.48E−28	20.9838	1.75E−28	21.901	1.80E−28	22.8159	1.84E−28	23.816	1.85E−28
16.7644	4.08E−28	21.0838	3.90E−28	22.001	3.71E−28	22.9159	3.70E−28	23.916	3.61E−28
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	4.13E−28	21.2838	3.86E−28	22.201	3.79E−28	23.1159	3.70E−28	24.116	3.63E−28
17.0644	1.53E−28	21.3838	1.83E−28	22.301	1.83E−28	23.2159	1.85E−28	24.216	1.87E−28
17.1644	1.02E−28	21.4838	8.51E−29	22.401	8.92E−29	23.3159	9.17E−29	24.316	9.40E−29
17.2644	4.69E−29	21.5838	5.15E−29	22.501	5.28E−29	23.4159	5.42E−29	24.416	5.54E−29
17.3644	3.53E−29	21.6838	3.69E−29	22.601	3.76E−29	23.5159	3.81E−29	24.516	3.85E−29

Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	4.24E−29	29.6684	4.18E−29	30.7617	4.23E−29	31.878	4.35E−29	33.0057	4.45E−29
28.6936	6.43E−29	29.7684	6.39E−29	30.8617	6.49E−29	31.978	6.63E−29	33.1057	6.69E−29
28.7936	1.09E−28	29.8684	1.07E−28	30.9617	1.10E−28	32.078	1.12E−28	33.2057	1.13E−28
28.8936	1.95E−28	29.9684	1.95E−28	31.0617	1.92E−28	32.178	1.91E−28	33.3057	1.88E−28
28.9936	3.20E−28	30.0684	3.13E−28	31.1617	3.03E−28	32.278	2.94E−28	33.4057	2.85E−28
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	3.22E−28	30.2684	3.12E−28	31.3617	3.06E−28	32.478	2.98E−28	33.6057	2.91E−28
29.2936	1.97E−28	30.3684	1.94E−28	31.4617	1.96E−28	32.578	1.95E−28	33.7057	1.96E−28
29.3936	1.11E−28	30.4684	1.09E−28	31.5617	1.14E−28	32.678	1.16E−28	33.8057	1.19E−28
29.4936	6.67E−29	30.5684	6.54E−29	31.6617	6.77E−29	32.778	6.91E−29	33.9057	7.10E−29
29.5936	4.45E−29	30.6684	4.31E−29	31.7617	4.40E−29	32.878	4.58E−29	34.0057	4.68E−29

Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	4.44E−29	38.9574	5.05E−29	41.4642	5.17E−29	44.055	5.54E−29	46.7136	5.73E−29
36.6187	6.47E−29	39.0574	7.59E−29	41.5642	7.85E−29	44.155	8.19E−29	46.8136	8.32E−29
36.7187	9.86E−29	39.1574	1.19E−28	41.6642	1.20E−28	44.255	1.21E−28	46.9136	1.21E−28
36.8187	1.44E−28	39.2574	1.83E−28	41.7642	1.78E−28	44.355	1.74E−28	47.0136	1.68E−28
36.9187	1.94E−28	39.3574	2.49E−28	41.8642	2.36E−28	44.455	2.23E−28	47.1136	2.10E−28
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	1.99E−28	39.5574	2.51E−28	42.0642	2.37E−28	44.655	2.23E−28	47.3136	2.11E−28
37.2187	1.50E−28	39.6574	1.85E−28	42.1642	1.80E−28	44.755	1.74E−28	47.4136	1.70E−28
37.3187	1.00E−28	39.7574	1.22E−28	42.2642	1.23E−28	44.855	1.22E−28	47.5136	1.22E−28
37.4187	6.68E−29	39.8574	7.77E−29	42.3642	8.11E−29	44.955	8.32E−29	47.6136	8.47E−29
37.5187	4.59E−29	39.9574	5.24E−29	42.4642	5.39E−29	45.055	5.65E−29	47.7136	5.86E−29

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ) = 90°; X = scattering cross section—Continued

Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X
58.1402	6.35E−29	59.6952	7.14E−29	44.6951	5.18E−32
58.2402	8.57E−29	59.7952	9.60E−29	45.6951	4.49E−32
58.3402	1.15E−28	59.8952	1.25E−28	46.6951	8.82E−32
58.4402	1.45E−28	59.9952	1.52E−28	47.6951	1.86E−31
58.5402	1.69E−28	60.0952	1.65E−28	48.6951	4.34E−31
58.6402		60.1952		49.6951	7.52E−31
58.7402	1.69E−28	60.2952	1.64E−28	50.6951	2.01E−30
58.8402	1.44E−28	60.3952	1.42E−28	51.6951	5.66E−30
58.9402	1.14E−28	60.4952	1.13E−28	52.6951	1.72E−29
59.0402	8.58E−29	60.5952	8.61E−29	53.6951	
59.1402	6.39E−29	60.6952	6.43E−29	54.6951	1.79E−29
				55.6951	6.31E−30
				56.6951	2.39E−30
				57.6951	1.01E−30

Polystyrene–C_8H_8

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	2.90E−29	20.6838	3.18E−29	21.601	3.24E−29	22.5159	3.29E−29	23.516	3.30E−29
16.4644	4.04E−29	20.7838	4.35E−29	21.701	4.41E−29	22.6159	4.54E−29	23.616	4.63E−29
16.5644	5.18E−29	20.8838	6.99E−29	21.801	7.32E−29	22.7159	7.64E−29	23.716	7.84E−29
16.6644	1.26E−28	20.9838	1.52E−28	21.901	1.58E−28	22.8159	1.61E−28	23.816	1.63E−28
16.7644	3.70E−28	21.0838	3.60E−28	22.001	3.40E−28	22.9159	3.40E−28	23.916	3.32E−28
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	3.74E−28	21.2838	3.53E−28	22.201	3.47E−28	23.1159	3.39E−28	24.116	3.33E−28
17.0644	1.31E−28	21.3838	1.60E−28	22.301	1.60E−28	23.2159	1.63E−28	24.216	1.65E−28
17.1644	8.51E−29	21.4838	7.27E−29	22.401	7.61E−29	23.3159	7.83E−29	24.316	8.03E−29
17.2644	4.27E−29	21.5838	4.53E−29	22.501	4.61E−29	23.4159	4.71E−29	24.416	4.79E−29
17.3644	3.25E−29	21.6838	3.36E−29	22.601	3.40E−29	23.5159	3.42E−29	24.516	3.44E−29

Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	3.53E−29	29.6684	3.62E−29	30.7617	3.64E−29	31.878	3.74E−29	33.0057	3.82E−29
28.6936	5.25E−29	29.7684	5.46E−29	30.8617	5.54E−29	31.978	5.66E−29	33.1057	5.71E−29
28.7936	9.10E−29	29.8684	9.29E−29	30.9617	9.59E−29	32.078	9.75E−29	33.2057	9.88E−29
28.8936	1.72E−28	29.9684	1.75E−28	31.0617	1.73E−28	32.178	1.72E−28	33.3057	1.70E−28
28.9936	2.94E−28	30.0684	2.89E−28	31.1617	2.79E−28	32.278	2.71E−28	33.4057	2.63E−28
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	2.95E−28	30.2684	2.87E−28	31.3617	2.82E−28	32.478	2.75E−28	33.6057	2.68E−28
29.2936	1.74E−28	30.3684	1.74E−28	31.4617	1.76E−28	32.578	1.76E−28	33.7057	1.77E−28
29.3936	9.28E−29	30.4684	9.43E−29	31.5617	9.91E−29	32.678	1.01E−28	33.8057	1.04E−28
29.4936	5.45E−29	30.5684	5.58E−29	31.6617	5.79E−29	32.778	5.90E−29	33.9057	6.07E−29
29.5936	3.69E−29	30.6684	3.73E−29	31.7617	3.79E−29	32.878	3.93E−29	34.0057	4.01E−29

Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	3.84E−29	38.9574	4.31E−29	41.4642	4.41E−29	44.055	4.75E−29	46.7136	4.94E−29
36.6187	5.65E−29	39.0574	6.55E−29	41.5642	6.80E−29	44.155	7.16E−29	46.8136	7.31E−29
36.7187	8.98E−29	39.1574	1.05E−28	41.6642	1.07E−28	44.255	1.09E−28	46.9136	1.09E−28
36.8187	1.38E−28	39.2574	1.67E−28	41.7642	1.62E−28	44.355	1.59E−28	47.0136	1.54E−28
36.9187	1.97E−28	39.3574	2.30E−28	41.8642	2.18E−28	44.455	2.06E−28	47.1136	1.94E−28
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	1.98E−28	39.5574	2.32E−28	42.0642	2.19E−28	44.655	2.06E−28	47.3136	1.96E−28
37.2187	1.44E−28	39.6574	1.69E−28	42.1642	1.65E−28	44.755	1.60E−28	47.4136	1.56E−28
37.3187	9.14E−29	39.7574	1.08E−28	42.2642	1.10E−28	44.855	1.10E−28	47.5136	1.10E−28
37.4187	5.88E−29	39.8574	6.74E−29	42.3642	7.06E−29	44.955	7.28E−29	47.6136	7.45E−29
37.5187	3.97E−29	39.9574	4.47E−29	42.4642	4.61E−29	45.055	4.86E−29	47.7136	5.06E−29

Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X
58.1402	5.58E−29	59.6952	6.31E−29	44.6951	4.71E−33
58.2402	7.67E−29	59.7952	8.67E−29	45.6951	2.83E−32
58.3402	1.04E−28	59.8952	1.15E−28	46.6951	6.63E−32
58.4402	1.33E−28	59.9952	1.40E−28	47.6951	1.43E−31
58.5402	1.57E−28	60.0952	1.52E−28	48.6951	3.77E−31
58.6402		60.1952		49.6951	6.18E−31
58.7402	1.57E−28	60.2952	1.52E−28	50.6951	1.76E−30

TABLE 5. Double differential scattering cross sections ($m^2\,sr^{-1}\,keV^{-1}$) (relativistic) for few biological materials; scattering angle (θ) = 90°; X = scattering cross section—Continued

Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X
58.8402	1.33E−28	60.3952	1.30E−28	51.6951	5.24E−30
58.9402	1.04E−28	60.4952	1.03E−28	52.6951	1.52E−29
59.0402	7.67E−29	60.5952	7.72E−29	53.6951	
59.1402	5.61E−29	60.6952	5.65E−29	54.6951	1.58E−29
				55.6951	5.83E−30
				56.6951	2.18E−30
				57.6951	8.36E−31

Polyethylene–C_4H_4

Mo $K\alpha$	X	Ag $K\alpha$	X	Cd $K\alpha$	X	In $K\alpha$	X	Sn $K\alpha$	X
16.3644	1.45E−29	20.6838	1.59E−29	21.601	1.62E−29	22.5159	1.64E−29	23.516	1.65E−29
16.4644	2.02E−29	20.7838	2.17E−29	21.701	2.20E−29	22.6159	2.27E−29	23.616	2.32E−29
16.5644	2.59E−29	20.8838	3.50E−29	21.801	3.66E−29	22.7159	3.82E−29	23.716	3.92E−29
16.6644	6.31E−29	20.9838	7.62E−29	21.901	7.88E−29	22.8159	8.06E−29	23.816	8.16E−29
16.7644	1.85E−28	21.0838	1.80E−28	22.001	1.70E−28	22.9159	1.70E−28	23.916	1.66E−28
16.8644		21.1838		22.101		23.0159		24.016	
16.9644	1.87E−28	21.2838	1.76E−28	22.201	1.74E−28	23.1159	1.69E−28	24.116	1.66E−28
17.0644	6.55E−29	21.3838	7.98E−29	22.301	8.02E−29	23.2159	8.13E−29	24.216	8.26E−29
17.1644	4.25E−29	21.4838	3.64E−29	22.401	3.81E−29	23.3159	3.91E−29	24.316	4.01E−29
17.2644	2.14E−29	21.5838	2.26E−29	22.501	2.31E−29	23.4159	2.35E−29	24.416	2.40E−29
17.3644	1.63E−29	21.6838	1.68E−29	22.601	1.70E−29	23.5159	1.71E−29	24.516	1.72E−29

Cs $K\alpha$	X	Ba $K\alpha$	X	La $K\alpha$	X	Ce $K\alpha$	X	Pr $K\alpha$	X
28.5936	1.76E−29	29.6684	1.81E−29	30.7617	1.82E−29	31.878	1.87E−29	33.0057	1.91E−29
28.6936	2.62E−29	29.7684	2.73E−29	30.8617	2.77E−29	31.978	2.83E−29	33.1057	2.86E−29
28.7936	4.55E−29	29.8684	4.65E−29	30.9617	4.79E−29	32.078	4.88E−29	33.2057	4.94E−29
28.8936	8.60E−29	29.9684	8.77E−29	31.0617	8.66E−29	32.178	8.60E−29	33.3057	8.51E−29
28.9936	1.47E−28	30.0684	1.44E−28	31.1617	1.40E−28	32.278	1.36E−28	33.4057	1.32E−28
29.0936		30.1684		31.2617		32.378		33.5057	
29.1936	1.48E−28	30.2684	1.44E−28	31.3617	1.41E−28	32.478	1.38E−28	33.6057	1.34E−28
29.2936	8.72E−29	30.3684	8.72E−29	31.4617	8.82E−29	32.578	8.82E−29	33.7057	8.85E−29
29.3936	4.64E−29	30.4684	4.71E−29	31.5617	4.96E−29	32.678	5.07E−29	33.8057	5.20E−29
29.4936	2.72E−29	30.5684	2.79E−29	31.6617	2.89E−29	32.778	2.95E−29	33.9057	3.03E−29
29.5936	1.84E−29	30.6684	1.86E−29	31.7617	1.89E−29	32.878	1.97E−29	34.0057	2.00E−29

Sm $K\alpha$	X	Gd $K\alpha$	X	Dy $K\alpha$	X	Er $K\alpha$	X	Yb $K\alpha$	X
36.5187	1.92E−29	38.9574	2.16E−29	41.4642	2.21E−29	44.055	2.38E−29	46.7136	2.47E−29
36.6187	2.83E−29	39.0574	3.28E−29	41.5642	3.40E−29	44.155	3.58E−29	46.8136	3.66E−29
36.7187	4.51E−29	39.1574	5.26E−29	41.6642	5.36E−29	44.255	5.43E−29	46.9136	5.43E−29
36.8187	6.99E−29	39.2574	8.33E−29	41.7642	8.12E−29	44.355	7.95E−29	47.0136	7.71E−29
36.9187	1.01E−28	39.3574	1.15E−28	41.8642	1.09E−28	44.455	1.03E−28	47.1136	9.72E−29
37.0187		39.4574		41.9642		44.555		47.2136	
37.1187	1.01E−28	39.5574	1.16E−28	42.0642	1.09E−28	44.655	1.03E−28	47.3136	9.78E−29
37.2187	7.27E−29	39.6574	8.45E−29	42.1642	8.23E−29	44.755	7.98E−29	47.4136	7.81E−29
37.3187	4.59E−29	39.7574	5.42E−29	42.2642	5.49E−29	44.855	5.48E−29	47.5136	5.50E−29
37.4187	2.94E−29	39.8574	3.37E−29	42.3642	3.53E−29	44.955	3.64E−29	47.6136	3.73E−29
37.5187	1.98E−29	39.9574	2.24E−29	42.4642	2.31E−29	45.055	2.43E−29	47.7136	2.53E−29

Pt $K\alpha$	X	Au $K\alpha$	X	Am-241	X
58.1402	2.79E−29	59.6952	3.16E−29	44.6951	2.36E−33
58.2402	3.84E−29	59.7952	4.33E−29	45.6951	1.42E−32
58.3402	5.22E−29	59.8952	5.73E−29	46.6951	3.31E−32
58.4402	6.67E−29	59.9952	7.02E−29	47.6951	7.13E−32
58.5402	7.83E−29	60.0952	7.62E−29	48.6951	1.88E−31
58.6402		60.1952		49.6951	3.09E−31
58.7402	7.83E−29	60.2952	7.60E−29	50.6951	8.81E−31
58.8402	6.65E−29	60.3952	6.52E−29	51.6951	2.62E−30
58.9402	5.21E−29	60.4952	5.16E−29	52.6951	7.62E−30
59.0402	3.84E−29	60.5952	3.86E−29	53.6951	
59.1402	2.81E−29	60.6952	2.83E−29	54.6951	7.92E−30
				55.6951	2.91E−30
				56.6951	1.09E−30
				57.6951	4.18E−31

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]

5 keV								10 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.0008	46	0.0382	91	0.0697	136	0.0907	1	0.0034	46	0.1529	91	0.2791	136	0.3630
2	0.0017	47	0.0390	92	0.0703	137	0.0910	2	0.0068	47	0.1560	92	0.2815	137	0.3642
3	0.0025	48	0.0397	93	0.0709	138	0.0913	3	0.0102	48	0.1591	93	0.2839	138	0.3654
4	0.0034	49	0.0405	94	0.0715	139	0.0916	4	0.0136	49	0.1622	94	0.2862	139	0.3666
5	0.0042	50	0.0413	95	0.0721	140	0.0919	5	0.0170	50	0.1654	95	0.2885	140	0.3678
6	0.0051	51	0.0421	96	0.0727	141	0.0922	6	0.0204	51	0.1685	96	0.2909	141	0.3690
7	0.0059	52	0.0428	97	0.0732	142	0.0925	7	0.0238	52	0.1715	97	0.2932	142	0.3701
8	0.0068	53	0.0432	98	0.0738	143	0.0927	8	0.0272	53	0.1746	98	0.2954	143	0.3712
9	0.0076	54	0.0444	99	0.0744	144	0.0930	9	0.0307	54	0.1777	99	0.2976	144	0.3723
10	0.0085	55	0.0451	100	0.0749	145	0.0933	10	0.0341	55	0.1807	100	0.2998	145	0.3733
11	0.0093	56	0.0459	101	0.0755	146	0.0935	11	0.0374	56	0.1837	101	0.3020	146	0.3744
12	0.0102	57	0.0466	102	0.0760	147	0.0938	12	0.0409	57	0.1867	102	0.3042	147	0.3753
13	0.0110	58	0.0474	103	0.0765	148	0.0940	13	0.0443	58	0.1897	103	0.3063	148	0.3763
14	0.0119	59	0.0481	104	0.0771	149	0.0942	14	0.0476	59	0.1927	104	0.3084	149	0.3772
15	0.0127	60	0.0489	105	0.0776	150	0.0945	15	0.0510	60	0.1957	105	0.3105	150	0.3781
16	0.0136	61	0.0496	106	0.0781	151	0.0947	16	0.0544	61	0.1986	106	0.3126	151	0.3790
17	0.0144	62	0.0503	107	0.0786	152	0.0949	17	0.0578	62	0.2015	107	0.3146	152	0.3798
18	0.0153	63	0.0511	108	0.0791	153	0.0951	18	0.0612	63	0.2044	108	0.3167	153	0.3807
19	0.0161	64	0.0518	109	0.0796	154	0.0953	19	0.0645	64	0.2074	109	0.3187	154	0.3814
20	0.0169	65	0.0525	110	0.0801	155	0.0955	20	0.0679	65	0.2103	110	0.3206	155	0.3822
21	0.0178	66	0.0532	111	0.0806	156	0.0957	21	0.0713	66	0.2131	111	0.3226	156	0.3829
22	0.0193	67	0.0540	112	0.0811	157	0.0958	22	0.0774	67	0.2160	112	0.3245	157	0.3836
23	0.0195	68	0.0547	113	0.0815	158	0.0960	23	0.0780	68	0.2188	113	0.3264	158	0.3843
24	0.0203	69	0.0554	114	0.0820	159	0.0962	24	0.0813	69	0.2217	114	0.3283	159	0.3849
25	0.0211	70	0.0561	115	0.0825	160	0.0963	25	0.0846	70	0.2244	115	0.3301	160	0.3855
26	0.0220	71	0.0568	116	0.0829	161	0.0965	26	0.0880	71	0.2273	116	0.3319	161	0.3861
27	0.0228	72	0.0575	117	0.0834	162	0.0966	27	0.0913	72	0.2300	117	0.3337	162	0.3866
28	0.0236	73	0.0582	118	0.0838	163	0.0967	28	0.0946	73	0.2328	118	0.3355	163	0.3872
29	0.0244	74	0.0588	119	0.0843	164	0.0968	29	0.0979	74	0.2355	119	0.3373	164	0.3876
30	0.0253	75	0.0595	120	0.0847	165	0.0970	30	0.1012	75	0.2383	120	0.3390	165	0.3881
31	0.0261	76	0.0602	121	0.0851	166	0.0971	31	0.1045	76	0.2409	121	0.3407	166	0.3886
32	0.0269	77	0.0609	122	0.0855	167	0.0972	32	0.1078	77	0.2436	122	0.3424	167	0.3890
33	0.0277	78	0.0615	123	0.0859	168	0.0973	33	0.1111	78	0.2463	123	0.3440	168	0.3893
34	0.0286	79	0.0622	124	0.0863	169	0.0974	34	0.1144	79	0.2489	124	0.3456	169	0.3897
35	0.0294	80	0.0628	125	0.0867	170	0.0974	35	0.1176	80	0.2516	125	0.3472	170	0.3900
36	0.0302	81	0.0635	126	0.0871	171	0.0975	36	0.1209	81	0.2542	126	0.3488	171	0.3903
37	0.0310	82	0.0641	127	0.0875	172	0.0976	37	0.1241	82	0.2567	127	0.3503	172	0.3905
38	0.0318	83	0.0648	128	0.0879	173	0.0976	38	0.1274	83	0.2593	128	0.3518	173	0.3907
39	0.0326	84	0.0654	129	0.0883	174	0.0977	39	0.1306	84	0.2619	129	0.3533	174	0.3909
40	0.0334	85	0.0660	130	0.0886	175	0.0977	40	0.1338	85	0.2644	130	0.3548	175	0.3911
41	0.0342	86	0.0667	131	0.0890	176	0.0977	41	0.1370	86	0.2669	131	0.3562	176	0.3912
42	0.0350	87	0.0673	132	0.0893	177	0.0978	42	0.1402	87	0.2694	132	0.3576	177	0.3913
43	0.0358	88	0.0679	133	0.0897	178	0.0978	43	0.1434	88	0.2719	133	0.3590	178	0.3914
44	0.0366	89	0.0685	134	0.0900	179	0.0978	44	0.1466	89	0.2743	134	0.3603	179	0.3915
45	0.0374	90	0.0691	135	0.0903	180	0.0978	45	0.1497	90	0.2768	135	0.3616	180	0.3915

15 keV								20 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.0076	46	0.3441	91	0.6283	136	0.8171	1	0.0136	46	0.6118	91	1.1174	136	1.4534
2	0.0153	47	0.3511	92	0.6337	137	0.8199	2	0.0272	47	0.624	92	1.1269	137	1.4585
3	0.0230	48	0.3582	93	0.6390	138	0.8226	3	0.0410	48	0.6368	93	1.1364	138	1.4634
4	0.0307	49	0.3651	94	0.6442	139	0.8254	4	0.0546	49	0.6492	94	1.1458	139	1.4682
5	0.0383	50	0.3722	95	0.6495	140	0.8280	5	0.0682	50	0.6617	95	1.1550	140	1.4729
6	0.0460	51	0.3791	96	0.6547	141	0.8307	6	0.0818	51	0.6741	96	1.1643	141	1.4777
7	0.0537	52	0.3861	97	0.6599	142	0.8332	7	0.0955	52	0.6865	97	1.1736	142	1.4822
8	0.0613	53	0.3930	98	0.6649	143	0.8357	8	0.1091	53	0.6987	98	1.1825	143	1.4866
9	0.0691	54	0.3998	99	0.6699	144	0.8381	9	0.1228	54	0.7109	99	1.1915	144	1.4909
10	0.0767	55	0.4066	100	0.6749	145	0.8405	10	0.1365	55	0.7230	100	1.2002	145	1.4951
11	0.0843	56	0.4135	101	0.6798	146	0.8428	11	0.1499	56	0.7352	101	1.2090	146	1.4992
12	0.0920	57	0.4203	102	0.6846	147	0.8450	12	0.1636	57	0.7473	102	1.2177	147	1.5031
13	0.0996	58	0.4270	103	0.6895	148	0.8471	13	0.1772	58	0.7592	103	1.2263	148	1.5069
14	0.1072	59	0.4337	104	0.6943	149	0.8492	14	0.1906	59	0.7711	104	1.2348	149	1.5107

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

15 keV								20 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
15	0.1149	60	0.4404	105	0.6989	150	0.8512	15	0.2043	60	0.7830	105	1.2431	150	1.5143
16	0.1225	61	0.4470	106	0.7036	151	0.8532	16	0.2179	61	0.7948	106	1.2514	151	1.5177
17	0.1301	62	0.4536	107	0.7082	152	0.8550	17	0.2313	62	0.8065	107	1.2596	152	1.5210
18	0.1377	63	0.4601	108	0.7128	153	0.8570	18	0.2448	63	0.8181	108	1.2678	153	1.5245
19	0.1453	64	0.4667	109	0.7173	154	0.8586	19	0.2583	64	0.8299	109	1.2758	154	1.5275
20	0.1528	65	0.4732	110	0.7217	155	0.8604	20	0.2717	65	0.8415	110	1.2836	155	1.5306
21	0.1604	66	0.4797	111	0.7261	156	0.8620	21	0.2852	66	0.8529	111	1.2915	156	1.5335
22	0.1743	67	0.4861	112	0.7304	157	0.8636	22	0.3099	67	0.8644	112	1.2992	157	1.5363
23	0.1755	68	0.4925	113	0.7347	158	0.8651	23	0.3120	68	0.8758	113	1.3067	158	1.5390
24	0.1830	69	0.4989	114	0.7389	159	0.8665	24	0.3255	69	0.8871	114	1.3142	159	1.5415
25	0.1905	70	0.5051	115	0.7431	160	0.8679	25	0.3388	70	0.8983	115	1.3218	160	1.5440
26	0.1981	71	0.5115	116	0.7472	161	0.8692	26	0.3522	71	0.9095	116	1.3290	161	1.5462
27	0.2055	72	0.5176	117	0.7512	162	0.8704	27	0.3654	72	0.9205	117	1.3362	162	1.5484
28	0.2130	73	0.5239	118	0.7553	163	0.8716	28	0.3787	73	0.9316	118	1.3435	163	1.5506
29	0.2204	74	0.5301	119	0.7592	164	0.8727	29	0.3918	74	0.9426	119	1.3504	164	1.5525
30	0.2279	75	0.5362	120	0.7631	165	0.8737	30	0.4052	75	0.9536	120	1.3573	165	1.5544
31	0.2353	76	0.5422	121	0.7669	166	0.8747	31	0.4183	76	0.9643	121	1.3640	166	1.5561
32	0.2427	77	0.5483	122	0.7707	167	0.8757	32	0.4315	77	0.9751	122	1.3708	167	1.5578
33	0.2501	78	0.5543	123	0.7744	168	0.8765	33	0.4446	78	0.9858	123	1.3774	168	1.5593
34	0.2575	79	0.5602	124	0.7780	169	0.8773	34	0.4578	79	0.9963	124	1.3838	169	1.5607
35	0.2648	80	0.5662	125	0.7816	170	0.8780	35	0.4708	80	1.0069	125	1.3903	170	1.5619
36	0.2721	81	0.5720	126	0.7851	171	0.8786	36	0.4838	81	1.0173	126	1.3966	171	1.5630
37	0.2794	82	0.5779	127	0.7886	172	0.8792	37	0.4968	82	1.0276	127	1.4027	172	1.5641
38	0.2867	83	0.5837	128	0.7920	173	0.8797	38	0.5098	83	1.0380	128	1.4088	173	1.5649
39	0.2939	84	0.5895	129	0.7953	174	0.8801	39	0.5226	84	1.0483	129	1.4146	174	1.5657
40	0.3012	85	0.5950	130	0.7986	175	0.8805	40	0.5355	85	1.0582	130	1.4206	175	1.5663
41	0.3084	86	0.6007	131	0.8019	176	0.8807	41	0.5483	86	1.0683	131	1.4264	176	1.5668
42	0.3156	87	0.6063	132	0.8050	177	0.8810	42	0.5612	87	1.0783	132	1.4319	177	1.5673
43	0.3227	88	0.6119	133	0.8081	178	0.8812	43	0.5738	88	1.0882	133	1.4374	178	1.5676
44	0.3299	89	0.6174	134	0.8112	179	0.8812	44	0.5865	89	1.0981	134	1.4429	179	1.5678
45	0.3369	90	0.6229	135	0.8141	180	0.8813	45	0.5991	90	1.1078	135	1.4481	180	1.5679

25 keV								30 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.0212	46	0.9560	91	1.7467	136	2.2727	1	0.0306	46	1.3769	91	2.5166	136	3.2757
2	0.0425	47	0.9756	92	1.7617	137	2.2806	2	0.0612	47	1.4051	92	2.5382	137	3.2871
3	0.0642	48	0.9952	93	1.7764	138	2.2882	3	0.0922	48	1.4334	93	2.5595	138	3.2981
4	0.0853	49	1.0146	94	1.7911	139	2.2959	4	0.1229	49	1.4612	94	2.5807	139	3.3091
5	0.1066	50	1.0341	95	1.8056	140	2.3033	5	0.1535	50	1.4895	95	2.6016	140	3.3198
6	0.1279	51	1.0533	96	1.8201	141	2.3106	6	0.1842	51	1.5174	96	2.6225	141	3.3305
7	0.1492	52	1.0729	97	1.8346	142	2.3178	7	0.2148	52	1.5452	97	2.6434	142	3.3408
8	0.1705	53	1.0920	98	1.8486	143	2.3247	8	0.2455	53	1.5728	98	2.6636	143	3.3507
9	0.1920	54	1.1111	99	1.8626	144	2.3313	9	0.2765	54	1.6003	99	2.6838	144	3.3603
10	0.2133	55	1.1299	100	1.8764	145	2.3380	10	0.3071	55	1.6275	100	2.7037	145	3.3699
11	0.2343	56	1.1490	101	1.8901	146	2.3444	11	0.3374	56	1.6550	101	2.7235	146	3.3792
12	0.2556	57	1.1679	102	1.9036	147	2.3505	12	0.3681	57	1.6822	102	2.7430	147	3.3881
13	0.2769	58	1.1865	103	1.9171	148	2.3564	13	0.3987	58	1.7090	103	2.7625	148	3.3966
14	0.2979	59	1.2052	104	1.9304	149	2.3623	14	0.4290	59	1.7359	104	2.7816	149	3.4051
15	0.3192	60	1.2238	105	1.9434	150	2.3680	15	0.4597	60	1.7627	105	2.8004	150	3.4133
16	0.3405	61	1.2422	106	1.9565	151	2.3734	16	0.4903	61	1.7892	106	2.8192	151	3.4211
17	0.3615	62	1.2605	107	1.9692	152	2.3786	17	0.5206	62	1.8157	107	2.8377	152	3.4286
18	0.3826	63	1.2787	108	1.9820	153	2.3840	18	0.5509	63	1.8418	108	2.8561	153	3.4364
19	0.4036	64	1.2971	109	1.9946	154	2.3887	19	0.5812	64	1.8683	109	2.8742	154	3.4432
20	0.4246	65	1.3152	110	2.0068	155	2.3936	20	0.6115	65	1.8945	110	2.8919	155	3.4503
21	0.4457	66	1.3331	111	2.0191	156	2.3981	21	0.6418	66	1.9203	111	2.9097	156	3.4567
22	0.4843	67	1.3510	112	2.0312	157	2.4025	22	0.6975	67	1.9461	112	2.9270	157	3.4631
23	0.4875	68	1.3689	113	2.0430	158	2.4067	23	0.7021	68	1.9719	113	2.9441	158	3.4692
24	0.5086	69	1.3865	114	2.0548	159	2.4106	24	0.7324	69	1.9973	114	2.9611	159	3.4749
25	0.5294	70	1.4039	115	2.0666	160	2.4146	25	0.7623	70	2.0224	115	2.9781	160	3.4805
26	0.5504	71	1.4216	116	2.0779	161	2.4180	26	0.7927	71	2.0478	116	2.9945	161	3.4855
27	0.5710	72	1.4388	117	2.0892	162	2.4215	27	0.8223	72	2.0726	117	3.0108	162	3.4905
28	0.5918	73	1.4562	118	2.1005	163	2.4249	28	0.8522	73	2.0977	118	3.0271	163	3.4955

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

25 keV								30 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
29	0.6123	74	1.4733	119	2.1113	164	2.4279	29	0.8818	74	2.1224	119	3.0427	164	3.4998
30	0.6331	75	1.4905	120	2.1222	165	2.4308	30	0.9118	75	2.1472	120	3.0583	165	3.5040
31	0.6537	76	1.5072	121	2.1327	166	2.4335	31	0.9414	76	2.1712	121	3.0736	166	3.5079
32	0.6742	77	1.5241	122	2.1433	167	2.4362	32	0.9710	77	2.1956	122	3.0889	167	3.5119
33	0.6945	78	1.5408	123	2.1536	168	2.4385	33	1.0006	78	2.2197	123	3.1038	168	3.5151
34	0.7154	79	1.5572	124	2.1637	169	2.4407	34	1.0302	79	2.2434	124	3.1183	169	3.5183
35	0.7357	80	1.5739	125	2.1738	170	2.4426	35	1.0595	80	2.2674	125	3.1329	170	3.5211
36	0.7560	81	1.5901	126	2.1836	171	2.4444	36	1.0888	81	2.2908	126	3.1471	171	3.5236
37	0.7763	82	1.6063	127	2.1932	172	2.4462	37	1.1180	82	2.3141	127	3.1610	172	3.5261
38	0.7966	83	1.6225	128	2.2028	173	2.4473	38	1.1473	83	2.3375	128	3.1748	173	3.5279
39	0.8167	84	1.6387	129	2.2119	174	2.4486	39	1.1762	84	2.3609	129	3.1880	174	3.5297
40	0.8368	85	1.6542	130	2.2213	175	2.4495	40	1.2051	85	2.3834	130	3.2015	175	3.5311
41	0.8569	86	1.6699	131	2.2304	176	2.4503	41	1.2341	86	2.4058	131	3.2146	176	3.5321
42	0.8769	87	1.6856	132	2.2390	177	2.4510	42	1.2630	87	2.4285	132	3.2270	177	3.5332
43	0.8968	88	1.7010	133	2.2476	178	2.4516	43	1.2915	88	2.4508	133	3.2395	178	3.5339
44	0.9166	89	1.7165	134	2.2562	179	2.4518	44	1.3201	89	2.4731	134	3.2519	179	3.5343
45	0.9362	90	1.7317	135	2.2644	180	2.4520	45	1.3483	90	2.4950	135	3.2636	180	3.5346

35 keV								40 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.0417	46	1.8745	91	3.4276	136	4.4634	1	0.0544	46	2.4489	91	4.4801	136	5.8370
2	0.0834	47	1.9130	92	3.4570	137	4.4790	2	0.1089	47	2.4991	92	4.5187	137	5.8574
3	0.1256	48	1.9514	93	3.4860	138	4.4940	3	0.1640	48	2.5494	93	4.5566	138	5.8771
4	0.1673	49	1.9894	94	3.5150	139	4.5091	4	0.2185	49	2.5990	94	4.5946	139	5.8969
5	0.2090	50	2.0278	95	3.5435	140	4.5236	5	0.2730	50	2.6493	95	4.6319	140	5.9159
6	0.2507	51	2.0658	96	3.5720	141	4.5382	6	0.3275	51	2.6989	96	4.6692	141	5.9350
7	0.2924	52	2.1038	97	3.6005	142	4.5523	7	0.3820	52	2.7485	97	4.7065	142	5.9535
8	0.3341	53	2.1413	98	3.6281	143	4.5659	8	0.4364	53	2.7976	98	4.7426	143	5.9713
9	0.3763	54	2.1788	99	3.6556	144	4.5790	9	0.4916	54	2.8466	99	4.7787	144	5.9885
10	0.4180	55	2.2158	100	3.6827	145	4.5921	10	0.5460	55	2.8950	100	4.8141	145	6.0057
11	0.4593	56	2.2533	101	3.7098	146	4.6047	11	0.5999	56	2.9440	101	4.8496	146	6.0223
12	0.5010	57	2.2903	102	3.7364	147	4.6168	12	0.6544	57	2.9925	102	4.8844	147	6.0382
13	0.5427	58	2.3269	103	3.7630	148	4.6285	13	0.7089	58	3.0403	103	4.9192	148	6.0535
14	0.5840	59	2.3635	104	3.7891	149	4.6402	14	0.7628	59	3.0881	104	4.9534	149	6.0688
15	0.6257	60	2.4000	105	3.8147	150	4.6513	15	0.8173	60	3.1359	105	4.9870	150	6.0834
16	0.6674	61	2.4361	106	3.8403	151	4.6620	16	0.8718	61	3.1831	106	5.0206	151	6.0974
17	0.7087	62	2.4722	107	3.8655	152	4.6722	17	0.9256	62	3.2302	107	5.0535	152	6.1108
18	0.7499	63	2.5078	108	3.8907	153	4.6829	18	0.9795	63	3.2768	108	5.0865	153	6.1248
19	0.7911	64	2.5439	109	3.9153	154	4.6921	19	1.0334	64	3.3240	109	5.1188	154	6.1369
20	0.8324	65	2.5795	110	3.9395	155	4.7019	20	1.0873	65	3.3706	110	5.1505	155	6.1497
21	0.8736	66	2.6147	111	3.9637	156	4.7106	21	1.1412	66	3.4166	111	5.1822	156	6.1612
22	0.9494	67	2.6498	112	3.9875	157	4.7194	22	1.2402	67	3.4625	112	5.2133	157	6.1726
23	0.9557	68	2.6850	113	4.0107	158	4.7276	23	1.2483	68	3.5085	113	5.2437	158	6.1835
24	0.9969	69	2.7197	114	4.0339	159	4.7354	24	1.3022	69	3.5539	114	5.2742	159	6.1937
25	1.0377	70	2.7539	115	4.0572	160	4.7432	25	1.3555	70	3.5986	115	5.3046	160	6.2039
26	1.0790	71	2.7885	116	4.0795	161	4.7500	26	1.4094	71	3.6440	116	5.3338	161	6.2128
27	1.1193	72	2.8223	117	4.1017	162	4.7568	27	1.4620	72	3.6881	117	5.3630	162	6.2217
28	1.1601	73	2.8565	118	4.1240	163	4.7636	28	1.5153	73	3.7328	118	5.3922	163	6.2306
29	1.2004	74	2.8902	119	4.1453	164	4.7694	29	1.5680	74	3.7769	119	5.4201	164	6.2383
30	1.2412	75	2.9239	120	4.1667	165	4.7753	30	1.6213	75	3.8211	120	5.4481	165	6.2459
31	1.2815	76	2.9567	121	4.1875	166	4.7806	31	1.6740	76	3.8640	121	5.4754	166	6.2530
32	1.3218	77	2.9900	122	4.2083	167	4.7860	32	1.7266	77	3.9075	122	5.5027	167	6.2600
33	1.3621	78	3.0228	123	4.2287	168	4.7903	33	1.7793	78	3.9504	123	5.5294	168	6.2656
34	1.4024	79	3.0551	124	4.2486	169	4.7947	34	1.8320	79	3.9926	124	5.5554	169	6.2715
35	1.4423	80	3.0879	125	4.2684	170	4.7986	35	1.8840	80	4.0355	125	5.5815	170	6.2766
36	1.4821	81	3.1197	126	4.2878	171	4.8020	36	1.9361	81	4.0772	126	5.6069	171	6.2810
37	1.5220	82	3.1515	127	4.3067	172	4.8054	37	1.9882	82	4.1188	127	5.6317	172	6.2855
38	1.5618	83	3.1834	128	4.3257	173	4.8078	38	2.0403	83	4.1605	128	5.6564	173	6.2887
39	1.6012	84	3.2152	129	4.3436	174	4.8103	39	2.0917	84	4.2022	129	5.6800	174	6.2919
40	1.6406	85	3.2456	130	4.3620	175	4.8122	40	2.1432	85	4.2419	130	5.7041	175	6.2944
41	1.6800	86	3.2765	131	4.3803	176	4.8137	41	2.1946	86	4.2824	131	5.7276	176	6.2963
42	1.7193	87	3.3074	132	4.3970	177	4.8151	42	2.2461	87	4.3228	132	5.7499	177	6.2982

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

35 keV								40 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
43	1.7583	88	3.3378	133	4.4139	178	4.8161	43	2.2969	88	4.3626	133	5.7722	178	6.2995
44	1.7972	89	3.3682	134	4.4309	179	4.8166	44	2.3478	89	4.4024	134	5.7944	179	6.3002
45	1.8356	90	3.3981	135	4.4469	180	4.8171	45	2.3980	90	4.4416	135	5.8154	180	6.3008

45 keV								50 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.0689	46	3.1002	91	5.6749	136	7.3979	1	0.0851	46	3.8284	91	7.0126	136	9.1477
2	0.1379	47	3.1638	92	5.7238	137	7.4238	2	0.1702	47	3.9071	92	7.0731	137	9.1797
3	0.2076	48	3.2274	93	5.7720	138	7.4489	3	0.2563	48	3.9857	93	7.1327	138	9.2108
4	0.2766	49	3.2903	94	5.8201	139	7.4739	4	0.3414	49	4.0634	94	7.1924	139	9.2420
5	0.3455	50	3.3540	95	5.8675	140	7.4982	5	0.4266	50	4.1421	95	7.2510	140	9.2722
6	0.4145	51	3.4168	96	5.9148	141	7.5225	6	0.5117	51	4.2198	96	7.3096	141	9.3022
7	0.4834	52	3.4797	97	5.9622	142	7.5460	7	0.5966	52	4.2975	97	7.3683	142	9.3313
8	0.5524	53	3.5418	98	6.0080	143	7.5686	8	0.6820	53	4.3742	98	7.4250	143	9.3594
9	0.6221	54	3.6042	99	6.0537	144	7.5905	9	0.7681	54	4.4510	99	7.4817	144	9.3865
10	0.6911	55	3.6653	100	6.0987	145	7.6123	10	0.8532	55	4.5268	100	7.5374	145	9.4136
11	0.7593	56	3.7274	101	6.1437	146	7.6334	11	0.9374	56	4.6036	101	7.5931	146	9.4397
12	0.8282	57	3.7888	102	6.1879	147	7.6536	12	1.0226	57	4.6794	102	7.6479	147	9.4649
13	0.8972	58	3.8493	103	6.2322	148	7.6730	13	1.1077	58	4.7543	103	7.7027	148	9.4890
14	0.9654	59	3.9099	104	6.2756	149	7.6925	14	1.1919	59	4.8292	104	7.7564	149	9.5131
15	1.0344	60	3.9705	105	6.3182	150	7.7111	15	1.2771	60	4.9041	105	7.8092	150	9.5362
16	1.1034	61	4.0303	106	6.3608	151	7.7289	16	1.3622	61	4.9780	106	7.8620	151	9.5583
17	1.1716	62	4.0901	107	6.4027	152	7.7459	17	1.4464	62	5.0519	107	7.9139	152	9.5794
18	1.2398	63	4.1491	108	6.4445	153	7.7638	18	1.5306	63	5.1249	108	7.9657	153	9.6016
19	1.3080	64	4.2089	109	6.4855	154	7.7792	19	1.6149	64	5.1989	109	8.0166	154	9.6207
20	1.3762	65	4.2679	110	6.5258	155	7.7954	20	1.6991	65	5.2719	110	8.0664	155	9.6408
21	1.4444	66	4.3262	111	6.5660	156	7.8100	21	1.7833	66	5.3439	111	8.1163	156	9.6589
22	1.5697	67	4.3845	112	6.6055	157	7.8245	22	1.9381	67	5.4159	112	8.1652	157	9.6770
23	1.5800	68	4.4427	113	6.6442	158	7.8383	23	1.9508	68	5.4880	113	8.2131	158	9.6941
24	1.6482	69	4.5002	114	6.6828	159	7.8513	24	2.0350	69	5.5591	114	8.2611	159	9.7102
25	1.7157	70	4.5569	115	6.7215	160	7.8643	25	2.1183	70	5.6292	115	8.3090	160	9.7263
26	1.7839	71	4.6144	116	6.7586	161	7.8756	26	2.2026	71	5.7004	116	8.3549	161	9.7404
27	1.8506	72	4.6704	117	6.7957	162	7.8870	27	2.2849	72	5.7695	117	8.4009	162	9.7544
28	1.9180	73	4.7271	118	6.8327	163	7.8983	28	2.3682	73	5.8397	118	8.4468	163	9.7685
29	1.9847	74	4.7830	119	6.8682	164	7.9080	29	2.4505	74	5.9089	119	8.4908	164	9.7806
30	2.0522	75	4.8390	120	6.9037	165	7.9178	30	2.5339	75	5.9781	120	8.5348	165	9.7927
31	2.1189	76	4.8934	121	6.9384	166	7.9267	31	2.6162	76	6.0454	121	8.5778	166	9.8038
32	2.1855	77	4.9485	122	6.9731	167	7.9356	32	2.6986	77	6.1136	122	8.6208	167	9.8148
33	2.2522	78	5.0029	123	7.0070	168	7.9429	33	2.7810	78	6.1809	123	8.6628	168	9.8239
34	2.3189	79	5.0565	124	7.0401	169	7.9502	34	2.8634	79	6.2472	124	8.7039	169	9.8330
35	2.3849	80	5.1109	125	7.0731	170	7.9567	35	2.9448	80	6.3146	125	8.7449	170	9.8410
36	2.4508	81	5.1637	126	7.1054	171	7.9624	36	3.0262	81	6.3799	126	8.7849	171	9.8481
37	2.5167	82	5.2166	127	7.1369	172	7.9681	37	3.1076	82	6.4453	127	8.8240	172	9.8551
38	2.5827	83	5.2694	128	7.1684	173	7.9721	38	3.1891	83	6.5107	128	8.8630	173	9.8601
39	2.6478	84	5.3223	129	7.1983	174	7.9762	39	3.2696	84	6.5761	129	8.9001	174	9.8652
40	2.7130	85	5.3727	130	7.2290	175	7.9794	40	3.3501	85	6.6385	130	8.9381	175	9.8692
41	2.7782	86	5.4240	131	7.2589	176	7.9819	41	3.4306	86	6.7020	131	8.9752	176	9.8722
42	2.8433	87	5.4753	132	7.2872	177	7.9843	42	3.5111	87	6.7655	132	9.0103	177	9.8752
43	2.9077	88	5.5258	133	7.3155	178	7.9859	43	3.5907	88	6.8280	133	9.0454	178	9.8773
44	2.9721	89	5.5763	134	7.3438	179	7.9867	44	3.6702	89	6.8905	134	9.0805	179	9.8783
45	3.0357	90	5.6260	135	7.3704	180	7.9875	45	3.7488	90	6.9520	135	9.1136	180	9.8793

55 keV								60 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.1030	46	4.6338	91	8.4940	136	11.0880	1	0.1225	46	5.5165	91	10.1199	136	13.2209
2	0.2060	47	4.7293	92	8.5675	137	11.1270	2	0.2451	47	5.6300	92	10.2077	137	13.2677
3	0.3101	48	4.8243	93	8.6398	138	11.1649	3	0.3691	48	5.7435	93	10.2941	138	13.3129
4	0.4132	49	4.9184	94	8.7122	139	11.2027	4	0.4917	49	5.8555	94	10.3805	139	13.3582
5	0.5162	50	5.0137	95	8.7834	140	11.2393	5	0.6143	50	5.9691	95	10.4655	140	13.4021
6	0.6192	51	5.1078	96	8.8545	141	11.2760	6	0.7369	51	6.0812	96	10.5506	141	13.4459
7	0.7222	52	5.2020	97	8.9258	142	11.3114	7	0.8595	52	6.1934	97	10.6356	142	13.4883

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

55 keV								60 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
8	0.8252	53	5.2950	98	8.9946	143	11.3456	8	0.9821	53	6.3042	98	10.7174	143	13.5293
9	0.9294	54	5.3880	99	9.0634	144	11.3786	9	1.1061	54	6.4150	99	10.8001	144	13.5687
10	1.0324	55	5.4798	100	9.1311	145	11.4116	10	1.2287	55	6.5245	100	10.8809	145	13.6082
11	1.1343	56	5.5728	101	9.1988	146	11.4433	11	1.3499	56	6.6354	101	10.9618	146	13.6463
12	1.2373	57	5.6647	102	9.2653	147	11.4739	12	1.4726	57	6.7449	102	11.0412	147	13.6829
13	1.3404	58	5.7554	103	9.3318	148	11.5032	13	1.5952	58	6.8530	103	11.1207	48	13.7180
14	1.4423	59	5.8462	104	9.3971	149	11.5326	14	1.7165	59	6.9611	104	11.1988	149	13.7532
15	1.5453	60	5.9369	105	9.4612	150	11.5607	15	1.8391	60	7.0693	105	11.2754	150	13.7868
16	1.6484	61	6.0265	106	9.5254	151	11.5876	16	1.9618	61	7.1761	106	11.3521	151	13.8191
17	1.7503	62	6.1161	107	9.5883	152	11.6133	17	2.0831	62	7.2829	107	11.4273	152	13.8498
18	1.8522	63	6.2045	108	9.6513	153	11.6402	18	2.2044	63	7.3884	108	11.5026	153	13.8821
19	1.9541	64	6.2942	109	9.7131	154	11.6635	19	2.3257	64	7.4953	109	11.5764	154	13.9099
20	2.0560	65	6.3827	110	9.7737	155	11.6879	20	2.4470	65	7.6008	110	11.6488	155	13.9392
21	2.1579	66	6.4700	111	9.8342	156	11.7100	21	2.5683	66	7.7049	111	11.7213	156	13.9656
22	2.3452	67	6.5573	112	9.8937	157	11.7320	22	2.7913	67	7.8090	112	11.7923	157	13.9920
23	2.3607	68	6.6447	113	9.9519	158	11.7528	23	2.8096	68	7.9132	113	11.8619	158	14.0169
24	2.4626	69	6.7309	114	10.0101	159	11.7224	24	2.9310	69	8.0160	114	11.9315	159	14.0404
25	2.5634	70	6.8159	115	10.0684	160	11.7920	25	3.0510	70	8.1174	115	12.0012	160	14.0639
26	2.6654	71	6.9021	116	10.1242	161	11.8092	26	3.1724	71	8.2202	116	12.0679	161	14.0844
27	2.7650	72	6.9860	117	10.1801	162	11.8263	27	3.2910	72	8.3203	117	12.1347	162	14.1049
28	2.8659	73	7.0711	118	10.2359	163	11.8435	28	3.4111	73	8.4218	118	12.2015	163	14.1255
29	2.9655	74	7.1550	119	10.2894	164	11.8582	29	3.5297	74	8.5219	119	12.2654	164	14.1431
30	3.0664	75	7.2389	120	10.3428	165	11.8729	30	3.6498	75	8.6220	120	12.3294	165	14.1607
31	3.1661	76	7.3205	121	10.3951	166	11.8863	31	3.7685	76	8.7193	121	12.3919	166	14.1768
32	3.2658	77	7.4033	122	10.4474	167	11.8998	32	3.8872	77	8.8181	122	12.4544	167	14.1930
33	3.3655	78	7.4849	123	10.4985	168	11.9108	33	4.0060	78	8.9155	123	12.5155	168	14.2062
34	3.4653	79	7.5653	124	10.5483	169	11.9219	34	4.1247	79	9.0115	124	12.5752	169	14.2194
35	3.5638	80	7.6470	125	10.5982	170	11.9317	35	4.2421	80	9.1089	125	12.6346	170	14.2311
36	3.6624	81	7.7263	126	10.6469	171	11.9403	36	4.3595	81	9.2035	126	12.6931	171	14.2414
37	3.7610	82	7.8056	127	10.6944	172	11.9488	37	4.4769	82	9.2982	127	12.7499	172	14.2517
38	3.8596	83	7.8849	128	10.7412	173	11.9550	38	4.5944	83	9.3929	128	12.8067	173	14.2590
39	3.9571	84	7.9643	129	10.7869	174	11.9611	39	4.7104	84	9.4876	129	12.8606	174	14.2664
40	4.0546	85	8.0401	130	10.8332	175	11.9660	40	4.8265	85	9.5780	130	12.9160	175	14.2723
41	4.1521	86	8.1172	131	10.8783	176	11.9697	41	4.9426	86	9.6699	131	12.9699	176	14.2767
42	4.2496	87	8.1941	132	10.9209	177	11.9733	42	5.0588	87	9.7619	132	13.0210	177	14.2811
43	4.3459	88	8.2699	133	10.9636	178	11.9758	43	5.1735	88	9.8524	133	13.0720	178	14.2840
44	4.4423	89	8.3458	134	11.0063	179	11.9770	44	5.2883	89	9.9430	134	13.1231	179	14.2855
45	4.5374	90	8.4205	135	11.0465	180	11.9782	45	5.4017	90	10.0322	135	13.1713	180	14.2869

65 keV								70 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.1438	46	6.4766	91	11.8914	136	15.5486	1	0.1668	46	7.5144	91	13.8096	136	18.0734
2	0.2877	47	6.6099	92	11.9949	137	15.6038	2	0.3337	47	7.6691	92	13.9300	137	18.1379
3	0.4332	48	6.7433	93	12.0966	138	15.6573	3	0.5024	48	7.8240	93	14.0485	138	18.2003
4	0.5771	49	6.8750	94	12.1984	139	15.7108	4	0.6693	49	7.9769	94	14.1671	139	18.2628
5	0.7210	50	7.0084	95	12.2986	140	15.7625	5	0.8361	50	8.1319	95	14.2837	140	18.3232
6	0.8648	51	7.1402	96	12.3988	141	15.8143	6	1.0030	51	8.2849	96	14.4004	141	18.3837
7	1.0087	52	7.2720	97	12.4990	142	15.8644	7	1.1699	52	8.4381	97	14.5172	142	18.4422
8	1.1526	53	7.4023	98	12.5959	143	15.9128	8	1.3368	53	8.5893	98	14.6300	143	18.4987
9	1.2982	54	7.5325	99	12.6928	144	15.9594	9	1.5056	54	8.7406	99	14.7429	144	18.5532
10	1.4421	55	7.6611	100	12.7881	145	16.0061	10	1.6725	55	8.8900	100	14.8539	145	18.6077
11	1.5844	56	7.7915	101	12.8834	146	16.0510	11	1.8375	56	9.0415	101	14.9650	146	18.6602
12	1.7283	57	7.9202	102	12.9770	147	16.0943	12	2.0045	57	9.1910	102	15.0741	147	18.7107
13	1.8722	58	8.0473	103	13.0707	148	16.1358	13	2.1714	58	9.3387	103	15.1832	148	18.7592
14	2.0145	59	8.1744	104	13.1627	149	16.1773	14	2.3365	59	9.4864	104	15.2905	149	18.8077
15	2.1585	60	8.3016	105	13.2531	150	16.2171	15	2.5035	60	9.6342	105	15.3957	150	18.8542
16	2.3025	61	8.4272	106	13.3435	151	16.2552	16	2.6705	61	9.7801	106	15.5011	151	18.8986
17	2.4449	62	8.5528	107	13.4322	152	16.2915	17	2.8356	62	9.9261	107	15.6045	152	18.9411
18	2.5872	63	8.6768	108	13.5209	153	16.3296	18	3.0008	63	10.0702	108	15.7079	153	18.9856
19	2.7296	64	8.8025	109	13.6080	154	16.3625	19	3.1660	64	10.2163	109	15.8095	154	19.0240
20	2.8720	65	8.9265	110	13.6934	155	16.3971	20	3.3311	65	10.3605	110	15.9090	155	19.0645
21	3.0145	66	9.0490	111	13.7789	156	16.4283	21	3.4964	66	10.5028	111	16.0086	156	19.1009

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

65 keV								70 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
22	3.2762	67	9.1715	112	13.8626	157	16.4595	22	3.8000	67	10.6452	112	16.1063	157	19.1374
23	3.2977	68	9.2940	113	13.9447	158	16.4890	23	3.8250	68	10.7876	113	16.2020	158	19.1718
24	3.4402	69	9.4149	114	14.0268	159	16.5167	24	3.9903	69	10.9282	114	16.2978	159	19.2042
25	3.5811	70	9.5342	115	14.1090	160	16.5444	25	4.1537	70	11.0669	115	16.3936	160	19.2366
26	3.7236	71	9.6552	116	14.1877	161	16.5687	26	4.3191	71	11.2076	116	16.4854	161	19.2650
27	3.8629	72	9.7729	117	14.2665	162	16.5930	27	4.4807	72	11.3444	117	16.5773	162	19.2936
28	4.0038	73	9.8923	118	14.3453	163	16.6172	28	4.6442	73	11.4833	118	16.6693	163	19.3217
29	4.1432	74	10.0101	119	14.4208	164	16.6381	29	4.8059	74	11.6203	119	16.7572	164	19.3460
30	4.2842	75	10.1279	120	14.4962	165	16.6589	30	4.9695	75	11.7573	120	16.8452	165	19.3704
31	4.4235	76	10.2424	121	14.5700	166	16.6742	31	5.1312	76	11.8905	121	16.9313	166	19.3927
32	4.5629	77	10.3587	122	14.6438	167	16.6970	32	5.2930	77	12.0255	122	17.0174	167	19.4150
33	4.7024	78	10.4733	123	14.7150	168	16.7120	33	5.4548	78	12.1591	123	17.1015	168	19.4332
34	4.8418	79	10.5863	124	14.7863	169	16.7283	34	5.6166	79	12.2905	124	17.1836	169	19.4515
35	4.9797	80	10.7010	125	14.8567	170	16.7422	35	5.7766	80	12.4240	125	17.2658	170	19.4677
36	5.1175	81	10.8123	126	14.9254	171	16.7543	36	5.9366	81	12.5535	126	17.3460	171	19.4819
37	5.2554	82	10.9238	127	14.9925	172	16.7660	37	6.0967	82	12.6832	127	17.4243	172	19.4961
38	5.3934	83	11.0352	128	15.0595	173	16.7751	38	6.2568	83	12.8129	128	17.5025	173	19.5062
39	5.5297	84	11.1462	129	15.1232	174	16.7838	39	6.4150	84	12.9427	129	17.5768	174	19.5164
40	5.6661	85	11.2532	130	15.1886	175	16.7908	40	6.5733	85	13.0666	130	17.6531	175	19.5245
41	5.8024	86	11.3615	131	15.2523	176	16.7960	41	6.7316	86	13.1926	131	17.7275	176	19.5306
42	5.9389	87	11.4697	132	15.3125	177	16.8012	42	6.8900	87	13.3186	132	17.7978	177	19.5367
43	6.0737	88	11.5764	133	15.3728	178	16.8046	43	7.0465	88	13.4428	133	17.8682	178	19.5407
44	6.2085	89	11.6830	134	15.4331	179	16.8064	44	7.2030	89	13.5669	134	17.9386	179	19.5428
45	6.3417	90	11.7881	135	15.4900	180	16.8081	45	7.3577	90	13.6892	135	18.0050	180	19.5448

75 keV								80 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.1915	46	8.6298	91	15.8755	136	20.7980	1	0.2179	46	9.8233	91	18.0904	136	23.7252
2	0.3830	47	8.8078	92	16.0143	137	20.8725	2	0.4358	47	10.0260	92	18.2491	137	23.8107
3	0.5768	48	8.9857	93	16.1509	138	20.9447	3	0.6562	48	10.2288	93	18.4052	138	23.8934
4	0.7683	49	9.1616	94	16.2876	139	21.0170	4	0.8742	49	10.4292	94	18.5615	139	23.9763
5	0.9599	50	9.3397	95	16.4222	140	21.0869	5	1.0921	50	10.6322	95	18.7153	140	24.0565
6	1.1514	51	9.5157	96	16.5567	141	21.1568	6	1.3101	51	10.8327	96	18.8692	141	24.1367
7	1.3430	52	9.6917	97	16.6914	142	21.2245	7	1.5281	52	11.0334	97	19.0232	142	24.2143
8	1.5346	53	9.8656	98	16.8216	143	21.2898	8	1.7461	53	11.2316	98	19.1720	143	24.2892
9	1.7284	54	10.0396	99	16.9518	144	21.3528	9	1.9666	54	11.4299	99	19.3210	144	24.3615
10	1.9200	55	10.2115	100	17.0798	145	21.4159	10	2.1846	55	11.6258	100	19.4674	1.45	24.4338
11	2.1095	56	10.3856	101	17.2079	146	21.4766	11	2.4002	56	11.8243	101	19.6139	146	24.5035
12	2.3011	57	10.5576	102	17.3338	147	21.5350	12	2.6183	57	12.0204	102	19.7579	147	24.5705
13	2.4928	58	10.7275	103	17.4598	148	21.5911	13	2.8364	58	12.2140	103	19.9020	148	24.6348
14	2.6823	59	10.8974	104	17.5835	149	21.6472	14	3.0520	59	12.4078	104	20.0436	149	24.6992
15	2.8740	60	11.0674	105	17.7050	150	21.7010	15	3.2702	60	12.6016	105	20.1826	150	24.7609
16	3.0658	61	11.2352	106	17.8266	151	21.7525	16	3.4884	61	12.7930	106	20.3217	151	24.8200
17	3.2554	62	11.4032	107	17.9459	152	21.8016	17	3.7042	62	12.9846	107	20.4582	152	24.8763
18	3.4450	63	11.5689	108	18.0653	153	21.8531	18	3.9200	63	13.1736	108	20.5949	153	24.9354
19	3.6347	64	11.7370	109	18.1825	154	21.8976	19	4.1358	64	13.3654	109	20.7290	154	24.9865
20	3.8244	65	11.9030	110	18.2974	155	21.9444	20	4.3517	65	13.5547	110	20.8606	155	25.0402
21	4.0141	66	12.0668	111	18.4124	156	21.9866	21	4.5676	66	13.7415	111	20.9922	156	25.0886
22	4.3627	67	12.2306	112	18.5252	157	22.0287	22	4.9644	67	13.9284	112	21.1213	157	25.1370
23	4.3914	68	12.3946	113	18.6357	158	22.0686	23	4.9971	68	14.1155	113	21.2478	158	25.1827
24	4.5813	69	12.5564	114	18.7463	159	22.1061	24	5.2131	69	14.3001	114	21.3744	159	25.2257
25	4.7689	70	12.7160	115	18.8569	160	22.1436	25	5.4268	70	14.4823	115	21.5011	160	25.2688
26	4.9589	71	12.8780	116	18.9630	161	22.1764	26	5.6430	71	14.6671	116	21.6225	161	25.3065
27	5.1444	72	13.0355	117	19.0691	162	22.2093	27	5.8542	72	14.8469	117	21.7441	162	25.3441
28	5.3323	73	13.1954	118	19.1753	163	22.2421	28	6.0680	73	15.0294	118	21.8657	163	25.3818
29	5.5179	74	13.3532	119	19.2769	164	22.2702	29	6.2793	74	15.2094	119	21.9821	164	25.4141
30	5.7058	75	13.5110	120	19.3786	165	22.2984	30	6.4933	75	15.3895	120	22.0985	165	25.4465
31	5.8916	76	13.6643	121	19.4780	166	22.3242	31	6.7048	76	15.5646	121	22.2124	166	25.4761
32	6.0774	77	13.8201	122	19.5774	167	22.3500	32	6.9163	77	15.7424	122	22.3263	167	25.5057
33	6.2633	78	13.9736	123	19.6746	168	22.3710	33	7.1279	78	15.9177	123	22.4377	168	25.5300
34	6.4492	79	14.1250	124	19.7695	169	22.3923	34	7.3396	79	16.0906	124	22.5464	169	25.5542
35	6.6330	80	14.2787	125	19.8645	170	22.4111	35	7.5489	80	16.2661	125	22.6552	170	25.5758

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

75 keV								80 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
36	6.8168	81	14.4280	126	19.9572	171	22.4275	36	7.7582	81	16.4366	126	22.7614	171	25.5947
37	7.0007	82	14.5774	127	20.0476	172	22.4439	37	7.9676	82	16.6072	127	22.8650	172	25.6135
38	7.1847	83	14.7268	128	20.1381	173	22.4557	38	8.1771	83	16.7779	128	22.9687	173	25.6270
39	7.3665	84	14.8763	129	20.2239	174	22.4674	39	8.3842	84	16.9487	129	23.0671	174	25.6405
40	7.5483	85	15.0192	130	20.3121	175	22.4768	40	8.5913	85	17.1119	130	23.1682	175	25.6513
41	7.7303	86	15.1643	131	20.3981	176	22.4839	41	8.7985	86	17.2777	131	23.2667	176	25.6594
42	7.9123	87	15.3096	132	20.4794	177	22.4909	42	9.0058	87	17.4437	132	23.3599	177	25.6675
43	8.0921	88	15.4526	133	20.5608	178	22.4956	43	9.2107	88	17.6071	133	23.4532	178	25.6729
44	8.2720	89	15.5958	134	20.6421	179	22.4980	44	9.4157	89	17.7707	134	23.5465	179	25.6755
45	8.4498	90	15.7367	135	20.7189	180	22.5003	45	9.6182	90	17.9318	135	23.6345	180	25.6782

85 keV								90 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.2460	46	11.0950	91	20.4556	136	26.8581	1	0.2758	46	12.4451	91	22.9727	136	30.1999
2	0.4920	47	11.3242	92	20.6357	137	26.9553	2	0.5516	47	12.7024	92	23.1756	137	30.3099
3	0.7408	48	11.5534	93	20.8129	138	27.0496	3	0.8306	48	12.9599	93	23.3753	138	30.4165
4	0.9869	49	11.7800	94	20.9902	139	27.1439	4	1.1064	49	13.2143	94	23.5751	139	30.5231
5	1.2329	50	12.0095	95	21.1647	140	27.2351	5	1.3823	50	13.4721	95	23.7718	140	30.6264
6	1.4790	51	12.2363	96	21.3393	141	27.3265	6	1.6581	51	13.7268	96	23.9687	141	30.7297
7	1.7251	52	12.4633	97	21.5140	142	27.4148	7	1.9340	52	13.9817	97	24.1657	142	30.8297
8	1.9712	53	12.6874	98	21.6830	143	27.5001	8	2.2100	53	14.2335	98	24.3562	143	30.9262
9	2.2201	54	12.9118	99	21.8521	144	27.5824	9	2.4891	54	14.4855	99	24.5468	144	31.0193
10	2.4663	55	13.1333	100	22.0183	145	27.6648	10	2.7651	55	14.7345	100	24.7343	145	31.1125
11	2.7097	56	13.3579	101	22.1846	146	27.7441	11	3.0379	56	14.9868	101	24.9219	146	31.2023
12	2.9559	57	13.5797	102	22.3481	147	27.8204	12	3.3140	57	15.2360	102	25.1063	147	31.2886
13	3.2021	58	13.7988	103	22.5117	148	27.8937	13	3.5901	58	15.4822	103	25.2909	148	31.3715
14	3.4456	59	14.0180	104	22.6725	149	27.9670	14	3.8631	59	15.7286	104	25.4722	149	31.4545
15	3.6920	60	14.2374	105	22.8303	150	28.0373	15	4.1393	60	15.9751	105	25.6503	150	31.5341
16	3.9383	61	14.4540	106	22.9883	151	28.1046	16	4.4156	61	16.2186	106	25.8286	151	31.6102
17	4.1819	62	14.6707	107	23.1435	152	28.1688	17	4.6888	62	16.4622	107	26.0036	152	31.6829
18	4.4256	63	14.8847	108	23.2987	153	28.2361	18	4.9620	63	16.7028	108	26.1788	153	31.7590
19	4.6693	64	15.1017	109	23.4510	154	28.2943	19	5.2353	64	16.9467	109	26.3507	154	31.8249
20	4.9131	65	15.3160	110	23.6005	155	28.3555	20	5.5087	65	17.1877	110	26.5194	155	31.8942
21	5.1569	66	15.5275	111	23.7501	156	28.4106	21	5.7821	66	17.4255	111	26.6883	156	31.9566
22	5.6051	67	15.7392	112	23.8967	157	28.4657	22	6.2847	67	17.6635	112	26.8538	157	32.0190
23	5.6419	68	15.9510	113	24.0405	158	28.5178	23	6.3261	68	17.9017	113	27.0162	158	32.0780
24	5.8860	69	16.1600	114	24.1844	159	28.5669	24	6.5998	69	18.1368	114	27.1786	159	32.1335
25	6.1272	70	16.3663	115	24.3283	160	28.6159	25	6.8704	70	18.3688	115	27.3412	160	32.1890
26	6.3714	71	16.5756	116	24.4664	161	28.6588	26	7.1442	71	18.6042	116	27.4971	161	32.2376
27	6.6100	72	16.7792	117	24.6046	162	28.7018	27	7.4118	72	18.8333	117	27.6531	162	32.2862
28	6.8515	73	16.9859	118	24.7428	163	28.7447	28	7.6827	73	19.0659	118	27.8092	163	32.3349
29	7.0902	74	17.1898	119	24.8751	164	28.7815	29	7.9505	74	19.2953	119	27.9587	164	32.3766
30	7.3319	75	17.3939	120	25.0075	165	28.8184	30	8.2216	75	19.5249	120	28.1083	165	32.4183
31	7.5708	76	17.5923	121	25.1370	166	28.8521	31	8.4897	76	19.7482	121	28.2545	166	32.4565
32	7.8097	77	17.7937	122	25.2666	167	28.8859	32	8.7578	77	19.9749	122	28.4009	167	32.4947
33	8.0488	78	17.9924	123	25.3932	168	28.9130	33	9.0261	78	20.1985	123	28.5440	168	32.5260
34	8.2880	79	18.1883	124	25.5169	169	28.9412	34	9.2944	79	20.4190	124	28.6837	169	32.5573
35	8.5244	80	18.3872	125	25.6406	170	28.9658	35	9.5597	80	20.6429	125	28.8236	170	32.5850
36	8.7610	81	18.5804	126	25.7614	171	28.9873	36	9.8251	81	20.8605	126	28.9601	171	32.6095
37	8.9976	82	18.7738	127	25.8793	172	29.0088	37	10.0907	82	21.0782	127	29.0933	172	32.6339
38	9.2343	83	18.9673	128	25.9972	173	29.0241	38	10.3564	83	21.2961	128	29.2266	173	32.6513
39	9.4683	84	19.1609	129	26.1092	174	29.0395	39	10.6190	84	21.5142	129	29.3531	174	32.6687
40	9.7024	85	19.3459	130	26.2242	175	29.0518	40	10.8817	85	21.7225	130	29.4832	175	32.6826
41	9.9366	86	19.5340	131	26.3363	176	29.0610	41	11.1446	86	21.9343	131	29.6099	176	32.6930
42	10.1709	87	19.7222	132	26.4423	177	29.0702	42	11.4076	87	22.1463	132	29.7298	177	32.7035
43	10.4025	88	19.9075	133	26.5485	178	29.0764	43	11.6670	88	22.3551	133	29.8498	178	32.7104
44	10.6341	89	20.0930	134	26.6547	179	29.0796	44	11.9276	89	22.5641	134	29.9699	179	32.7139
45	10.8631	90	20.2756	135	26.7548	180	29.0825	45	12.1847	90	22.7700	135	30.0833	180	32.7174

95 keV								100 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.3073	46	13.8738	91	25.6431	136	33.7543	1	0.3405	46	15.3815	91	28.4684	136	37.5250

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

95 keV								100 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
2	0.6146	47	14.1610	92	25.8703	137	33.8780	2	0.6810	47	15.7002	92	28.7217	137	37.6634
3	0.9254	48	14.4484	93	26.0941	138	33.9978	3	1.0254	48	16.0192	93	28.9711	138	37.7976
4	1.2328	49	14.7324	94	26.3181	139	34.1178	4	1.3660	49	16.3345	94	29.2207	139	37.9318
5	1.5401	50	15.0201	95	26.5385	140	34.2339	5	1.7065	50	16.6540	95	29.4665	140	38.0618
6	1.8475	51	15.3045	96	26.7591	141	34.3502	6	2.0471	51	16.9697	96	29.7124	141	38.1918
7	2.1549	52	15.5891	97	26.9799	142	34.4626	7	2.3878	52	17.2857	97	29.9587	142	38.3177
8	2.4624	53	15.8702	98	27.1935	143	34.5712	8	2.7284	53	17.5979	98	30.1968	143	38.4392
9	2.7734	54	16.1516	99	27.4072	144	34.6759	9	3.0731	54	17.9104	99	30.4351	144	38.5565
10	3.0809	55	16.4296	100	27.6174	145	34.7808	10	3.4139	55	18.2191	100	30.6696	145	38.6739
11	3.3850	56	16.7114	101	27.8277	146	34.8818	11	3.7508	56	18.5321	101	30.9042	146	38.7869
12	3.6926	57	16.9898	102	28.0345	147	34.9789	12	4.0917	57	18.8414	102	31.1349	147	38.8957
13	4.0003	58	17.2647	103	28.2415	148	35.0723	13	4.4327	58	19.1469	103	31.3658	148	39.0002
14	4.3045	59	17.5399	104	28.4449	149	35.1656	14	4.7698	59	19.4526	104	31.5927	149	39.1048
15	4.6123	60	17.8153	105	28.6447	150	35.2552	15	5.1109	60	19.7586	105	31.8157	150	39.2050
16	4.9202	61	18.0873	106	28.8446	151	35.3408	16	5.4521	61	20.0608	106	32.0388	151	39.3010
17	5.2246	62	18.3595	107	29.0410	152	35.4226	17	5.7895	62	20.3633	107	32.2580	152	39.3926
18	5.5291	63	18.6283	108	29.2375	153	35.5084	18	6.1270	63	20.6621	108	32.4774	153	39.4886
19	5.8337	64	18.9010	109	29.4305	154	35.5825	19	6.4646	64	20.9651	109	32.6928	154	39.5716
20	6.1384	65	19.1702	110	29.6198	155	35.6605	20	6.8023	65	21.2644	110	32.9041	155	39.6590
21	6.4432	66	19.4360	111	29.8093	156	35.7307	21	7.1401	66	21.5599	111	33.1157	156	39.7376
22	7.0034	67	19.7021	112	29.9951	157	35.8010	22	7.7611	67	21.8557	112	33.3232	157	39.8163
23	7.0495	68	19.9683	113	30.1773	158	35.8664	23	7.8122	68	22.1517	113	33.5266	158	39.8907
24	7.3546	69	20.2312	114	30.3597	159	35.9299	24	8.1504	69	22.4440	114	33.7303	159	39.9607
25	7.6562	70	20.4906	115	30.5422	160	35.9924	25	8.4848	70	22.7325	115	33.9341	160	40.0308
26	7.9615	71	20.7538	116	30.7172	161	36.0471	26	8.8233	71	23.0253	116	34.1297	161	40.0921
27	8.2599	72	21.0100	117	30.8924	162	36.1019	27	9.1541	72	23.3102	117	34.3254	162	40.1534
28	8.5619	73	21.2701	118	31.0677	163	36.1566	28	9.4889	73	23.5995	118	34.5213	163	40.2148
29	8.8605	74	21.5267	119	31.2356	164	36.2036	29	9.8200	74	23.8850	119	34.7088	164	40.2674
30	9.1627	75	21.7836	120	31.4036	165	36.2505	30	10.1552	75	24.1708	120	34.8965	165	40.3200
31	9.4616	76	22.0333	121	31.5679	166	36.2936	31	10.4866	76	24.4487	121	35.0801	166	40.3682
32	9.7606	77	22.2870	122	31.7323	167	36.3366	32	10.8181	77	24.7310	122	35.2639	167	40.4165
33	10.0597	78	22.5371	123	31.8930	168	36.3719	33	11.1499	78	25.0094	123	35.4435	168	40.4560
34	10.3590	79	22.7838	124	32.0500	169	36.4071	34	11.4818	79	25.2840	124	35.6190	169	40.4955
35	10.6548	80	23.0345	125	32.2072	170	36.4385	35	11.8099	80	25.5630	125	35.7947	170	40.5306
36	10.9509	81	23.2779	126	32.3606	171	36.4655	36	12.1383	81	25.8340	126	35.9662	171	40.5613
37	11.2470	82	23.5216	127	32.5103	172	36.4933	37	12.4668	82	26.1053	127	36.1336	172	40.5920
38	11.5434	83	23.7655	128	32.6601	173	36.5129	38	12.7955	83	26.3769	128	36.3011	173	40.6140
39	11.8363	84	24.0097	129	32.8023	174	36.5325	39	13.1205	84	26.6488	129	36.4601	174	40.6360
40	12.1294	85	24.2429	130	32.9485	175	36.5482	40	13.4457	85	26.9085	130	36.6236	175	40.6535
41	12.4227	86	24.4801	131	33.0909	176	36.5600	41	13.7711	86	27.1727	131	36.7829	176	40.6667
42	12.7161	87	24.7174	132	33.2257	177	36.5717	42	14.0967	87	27.4371	132	36.9337	177	40.6799
43	13.0062	88	24.9513	133	33.3606	178	36.5796	43	14.4185	88	27.6976	133	37.0846	178	40.6887
44	13.2964	89	25.1854	134	33.4956	179	36.5835	44	14.7406	89	27.9584	134	37.2356	179	40.6931
45	13.5832	90	25.4160	135	33.6230	180	36.5874	45	15.0589	90	28.2154	135	37.3781	180	40.6975

105 keV								110 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.3754	46	16.9683	91	31.4505	136	41.5162	1	0.4120	46	18.6346	91	34.5911	136	45.7323
2	0.7508	47	17.3204	92	31.7314	137	41.6704	2	0.8240	47	19.0218	92	34.9014	137	45.9033
3	1.1305	48	17.6728	93	32.0081	138	41.8198	3	1.2408	48	19.4093	93	35.2070	138	46.0691
4	1.5060	49	18.0210	94	32.2851	139	41.9693	4	1.6528	49	19.7923	94	35.5130	139	46.2350
5	1.8815	50	18.3740	95	32.5577	140	42.1142	5	2.0649	50	20.1805	95	35.8143	140	46.3957
6	2.2570	51	18.7228	96	32.8307	141	42.2591	6	2.4771	51	20.5642	96	36.1159	141	46.5565
7	2.6326	52	19.0720	97	33.1039	142	42.3993	7	2.8893	52	20.9483	97	36.4179	142	46.7121
8	3.0082	53	19.4170	98	33.3682	143	42.5347	8	3.3016	53	21.3279	98	36.7100	143	46.8625
9	3.3882	54	19.7623	99	33.6328	144	42.6655	9	3.7186	54	21.7079	99	37.0025	144	47.0076
10	3.7639	55	20.1036	100	33.8930	145	42.7963	10	4.1310	55	22.0833	100	37.2902	145	47.1527
11	4.1354	56	20.4495	101	34.1536	146	42.9223	11	4.5388	56	22.4642	101	37.5782	146	47.2927
12	4.5113	57	20.7914	102	34.4097	147	43.0435	12	4.9514	57	22.8403	102	37.8614	147	47.4273
13	4.8873	58	21.1291	103	34.6661	148	43.1600	13	5.3641	58	23.2120	103	38.1450	148	47.5566
14	5.2590	59	21.4671	104	34.9182	149	43.2766	14	5.7721	59	23.5841	104	38.4238	149	47.6860
15	5.6352	60	21.8055	105	35.1658	150	43.3883	15	6.1851	60	23.9565	105	38.6977	150	47.8101

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

105 keV								110 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
16	6.0114	61	22.1397	106	35.4137	151	43.4953	16	6.5981	61	24.3245	106	38.9719	151	47.9289
17	6.3835	62	22.4742	107	35.6572	152	43.5974	17	7.0066	62	24.6929	107	39.2413	152	48.0423
18	6.7557	63	22.8046	108	35.9009	153	43.7045	18	7.4152	63	25.0567	108	39.5110	153	48.1612
19	7.1280	64	23.1398	109	36.1402	154	43.7970	19	7.8239	64	25.4259	109	39.7758	154	48.2640
20	7.5005	65	23.4709	110	36.3751	155	43.8945	20	8.2328	65	25.7905	110	40.0357	155	48.3722
21	7.8730	66	23.7978	111	36.6102	156	43.9822	21	8.6419	66	26.1506	111	40.2959	156	48.4697
22	8.5580	67	24.1251	112	36.8409	157	44.0700	22	9.3939	67	26.5111	112	40.5512	157	48.5672
23	8.6143	68	24.4527	113	37.0670	158	44.1529	23	9.4558	68	26.8720	113	40.8016	158	48.6593
24	8.9874	69	24.7761	114	37.2930	159	44.2310	24	9.8655	69	27.2284	114	41.0523	159	48.7460
25	9.3563	70	25.0954	115	37.5201	160	44.3091	25	10.2705	70	27.5802	115	41.3032	160	48.8328
26	9.7297	71	25.4195	116	37.7375	161	44.3775	26	10.6806	71	27.9374	116	41.5440	161	48.9088
27	10.0945	72	25.7349	117	37.9555	162	44.4459	27	11.0813	72	28.2850	117	41.7850	162	48.9848
28	10.4640	73	26.0552	118	38.1730	163	44.5143	28	11.4870	73	28.6381	118	42.0263	163	49.0608
29	10.8292	74	26.3713	119	38.3816	164	44.5730	29	11.8882	74	28.9865	119	42.2574	164	49.1260
30	11.1990	75	26.6877	120	38.5904	165	44.6317	30	12.2944	75	29.3354	120	42.4887	165	49.1912
31	11.5647	76	26.9955	121	38.7946	166	44.6855	31	12.6960	76	29.6747	121	42.7149	166	49.2510
32	11.9305	77	27.3080	122	38.9991	167	44.7390	32	13.0980	77	30.0194	122	42.9415	167	49.3108
33	12.2966	78	27.6164	123	39.1919	168	44.7834	33	13.5001	78	30.3595	123	43.1629	168	49.3598
34	12.6629	79	27.9206	124	39.3943	169	44.8275	34	13.9025	79	30.6951	124	43.3794	169	49.4082
35	13.0251	80	28.2297	125	39.5897	170	44.8666	35	14.3005	80	31.0360	125	43.5960	170	49.4523
36	13.3875	81	28.5300	126	39.7806	171	44.9009	36	14.6986	81	31.3673	126	43.8076	171	49.4904
37	13.7501	82	28.8306	127	39.9669	172	44.9352	37	15.0971	82	31.6990	127	44.0141	172	49.5285
38	14.1130	83	29.1316	128	40.1534	173	44.9597	38	15.4959	83	32.0311	128	44.2208	173	49.5557
39	14.4717	84	29.4329	129	40.3304	174	44.9842	39	15.8901	84	32.3636	129	44.4171	174	49.5864
40	14.8307	85	29.7208	130	40.5124	175	45.0038	40	16.2847	85	32.6814	130	44.6189	175	49.6047
41	15.1900	86	30.0134	131	40.6892	176	45.0185	41	16.6794	86	33.0046	131	44.8156	176	49.6211
42	15.5495	87	30.3068	132	40.8577	177	45.0332	42	17.0747	87	33.3282	132	45.0018	177	49.6374
43	15.9049	88	30.5957	133	41.0257	178	45.0430	43	17.4654	88	33.6472	133	45.1881	178	49.6483
44	16.2605	89	30.8849	134	41.1939	179	45.0438	44	17.8564	89	33.9665	134	45.3747	179	49.6538
45	16.6121	90	31.1698	135	41.3526	180	45.0529	45	18.2429	90	34.2811	135	45.5507	180	49.6592

115 keV								120 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.4503	46	20.3806	91	37.8923	136	50.1778	1	0.4903	46	22.2068	91	41.3560	136	54.8578
2	0.9006	47	20.8047	92	38.2337	137	50.3668	2	0.9806	47	22.6694	92	41.7304	137	55.0661
3	1.3561	48	21.2291	93	38.5700	138	50.5501	3	1.4766	48	23.1326	93	42.0992	138	55.2681
4	1.8065	49	21.6486	94	38.9068	139	50.7336	4	1.9670	49	23.5905	94	42.4686	139	55.4702
5	2.2570	50	22.0739	95	39.2384	140	50.9113	5	2.4575	50	24.0546	95	42.8323	140	55.6661
6	2.7074	51	22.4943	96	39.5704	141	51.0891	6	2.9480	51	24.5135	96	43.1966	141	55.8621
7	3.1580	52	22.9151	97	39.9029	142	51.2612	7	3.4386	52	24.9729	97	43.5613	142	56.0517
8	3.6086	53	23.3311	98	40.2245	143	51.4274	8	3.9293	53	25.4270	98	43.9143	143	56.2350
9	4.0645	54	23.7475	99	40.5466	144	51.5879	9	4.4257	54	25.8816	99	44.2677	144	56.4119
10	4.5153	55	24.1590	100	40.8634	145	51.7485	10	4.9166	55	26.3309	100	44.6154	145	56.5890
11	4.9610	56	24.5762	101	41.1807	146	51.9033	11	5.4020	56	26.7866	101	44.9637	146	56.7596
12	5.4120	57	24.9886	102	41.4927	147	52.0522	12	5.8931	57	27.2370	102	45.3062	147	56.9238
13	5.8631	58	25.3961	103	41.8051	148	52.1952	13	6.3844	58	27.6821	103	45.6492	148	57.0816
14	6.3092	59	25.8041	104	42.1122	149	52.3384	14	6.8702	59	28.1277	104	45.9864	149	57.2395
15	6.7606	60	26.2125	105	42.4140	150	52.4757	15	7.3619	60	28.5739	105	46.3179	150	57.3909
16	7.2122	61	26.6160	106	42.7163	151	52.6071	16	7.8537	61	29.0148	106	46.6498	151	57.5359
17	7.6587	62	27.0200	107	43.0132	152	52.7327	17	8.3400	62	29.4562	107	46.9759	152	57.6743
18	8.1055	63	27.4190	108	43.3104	153	52.8643	18	8.8266	63	29.8923	108	47.3025	153	57.8195
19	8.5523	64	27.8239	109	43.6024	154	52.9780	19	9.3133	64	30.3349	109	47.6233	154	57.9449
20	8.9994	65	28.2239	110	43.8890	155	53.0978	20	9.8003	65	30.7721	110	47.9382	155	58.0771
21	9.4467	66	28.6190	111	44.1759	156	53.2056	21	10.2876	66	31.2040	111	48.2535	156	58.1960
22	10.2691	67	29.0146	112	44.4575	157	53.3135	22	11.1834	67	31.6365	112	48.5630	157	58.3151
23	10.3368	68	29.4106	113	44.7336	158	53.4155	23	11.2572	68	32.0695	113	48.8665	158	58.4276
24	10.7847	69	29.8017	114	45.0101	159	53.5115	24	11.7452	69	32.4972	114	49.1704	159	58.5336
25	11.2277	70	30.1879	115	45.2869	160	53.6076	25	12.2270	70	32.9196	115	49.4748	160	58.6396
26	11.6762	71	30.5800	116	45.5525	161	53.6917	26	12.7165	71	33.3484	116	49.7669	161	58.7324
27	12.1145	72	30.9617	117	45.8185	162	53.7758	27	13.1940	72	33.7659	117	50.0593	162	58.8252
28	12.5582	73	31.3493	118	46.0847	163	53.8600	28	13.6776	73	34.1900	118	50.3522	163	58.9181
29	12.9970	74	31.7319	119	46.3397	164	53.9322	29	14.1558	74	34.6087	119	50.6326	164	58.9978

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

115 keV								120 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
30	13.4414	75	32.1151	120	46.5950	165	54.0044	30	14.6400	75	35.0279	120	50.9134	165	59.0775
31	13.8808	76	32.4877	121	46.8448	166	54.0706	31	15.1189	76	35.4358	121	51.1882	166	59.1506
32	14.3204	77	32.8664	122	47.0949	167	54.1368	32	15.5981	77	35.8502	122	51.4634	167	59.2237
33	14.7604	78	33.2400	123	47.3394	168	54.1910	33	16.0777	78	36.2592	123	51.7324	168	59.2835
34	15.2008	79	33.6086	124	47.5784	169	54.2453	34	16.5577	79	36.6628	124	51.9954	169	59.3433
35	15.6362	80	33.9832	125	47.8176	170	54.2935	35	17.0324	80	37.0730	125	52.2587	170	59.3966
36	16.0719	81	34.3473	126	48.0513	171	54.3357	36	17.5074	81	37.4717	126	52.5159	171	59.4431
37	16.5080	82	34.7119	127	48.2793	172	54.3779	37	17.9820	82	37.8709	127	52.7670	172	59.4897
38	16.9444	83	35.0769	128	48.5076	173	54.4080	38	18.4587	83	38.2707	128	53.0184	173	59.5230
39	17.3759	84	35.4425	129	48.7245	174	54.4382	39	18.9293	84	38.6712	129	53.2571	174	59.5563
40	17.8078	85	35.7918	130	48.9474	175	54.4623	40	19.4002	85	39.0539	130	53.5026	175	59.5829
41	18.2400	86	36.1472	131	49.1647	176	54.4804	41	19.8710	86	39.4433	131	53.7419	176	59.6029
42	18.6727	87	36.5031	132	49.3705	177	54.4985	42	20.3435	87	39.8333	132	53.9685	177	59.6229
43	19.1004	88	36.8539	133	49.5764	178	54.5106	43	20.8101	88	40.2177	133	54.1953	178	59.6362
44	19.5285	89	37.2051	134	49.7826	179	54.5166	44	21.2771	89	40.6027	134	54.4224	179	59.6429
45	19.9517	90	37.5512	135	49.9771	180	52.6723	45	21.7388	90	40.9822	135	54.6367	180	59.6495

125 keV								130 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.5320	46	24.1133	91	44.9846	136	59.7776	1	0.5754	46	26.1006	91	48.7803	136	64.9429
2	1.0641	47	24.6164	92	45.3938	137	60.0064	2	1.1509	47	26.6460	92	49.2263	137	65.1936
3	1.6023	48	25.1202	93	45.7970	138	60.2283	3	1.7330	48	27.1921	93	49.6658	138	65.4367
4	2.1344	49	25.6182	94	46.2008	139	60.4505	4	2.3086	49	27.7321	94	50.1060	139	65.6801
5	2.6666	50	26.1231	95	46.5985	140	60.6657	5	2.8842	50	28.2796	95	50.5396	140	65.9160
6	3.1989	51	26.6222	96	46.9968	141	60.8811	6	3.4599	51	28.8210	96	50.9739	141	66.1521
7	3.7312	52	27.1221	97	47.3958	142	61.0895	7	4.0358	52	29.3631	97	51.4090	142	66.3806
8	4.2637	53	27.6161	98	47.7818	143	61.2910	8	4.6117	53	29.8990	98	51.8301	143	66.6014
9	4.8024	54	28.1109	99	48.1685	144	61.4854	9	5.1944	54	30.4357	99	52.2519	144	66.8146
10	5.3351	55	28.5998	100	48.5490	145	61.6801	10	5.7706	55	30.9662	100	52.6669	145	67.0280
11	5.8618	56	29.0958	101	48.9300	146	61.8677	11	6.3404	56	31.5044	101	53.0827	146	67.2337
12	6.3948	57	29.5861	102	49.3048	147	62.0482	12	6.9170	57	32.0364	102	53.4918	147	67.4316
13	6.9280	58	30.0706	103	49.6803	148	62.2217	13	7.4938	58	32.5623	103	53.9015	148	67.6219
14	7.4552	59	30.5558	104	50.0494	149	62.3953	14	8.0641	59	33.0889	104	54.3045	149	67.8123
15	7.9888	60	31.0416	105	50.4123	150	62.5618	15	8.6414	60	33.6163	105	54.7006	150	67.9949
16	8.5226	61	31.5217	106	50.7757	151	62.7212	16	9.2189	61	34.1375	106	55.0974	151	68.1698
17	9.0504	62	32.0025	107	51.1329	152	62.8735	17	9.7900	62	34.6595	107	55.4874	152	68.3368
18	9.5785	63	32.4775	108	51.4905	153	63.0331	18	10.3614	63	35.1753	108	55.8780	153	68.5119
19	10.1069	64	32.9596	109	51.8419	154	63.1711	19	10.9331	64	35.6989	109	56.2618	154	68.6633
20	10.6356	65	33.4359	110	52.1868	155	63.3165	20	11.5051	65	36.2162	110	56.6386	155	68.8228
21	11.1645	66	33.9065	111	52.5323	156	63.4474	21	12.0775	66	36.7274	111	57.0160	156	68.9664
22	12.1370	67	34.3778	112	52.8714	157	63.5784	22	13.1299	67	37.2394	112	57.3865	157	69.1101
23	12.2171	68	34.8497	113	53.2040	158	63.7021	23	13.2166	68	37.7522	113	57.7500	158	69.2460
24	12.7470	69	35.3159	114	53.5371	159	63.8187	24	13.7900	69	38.2587	114	58.1141	159	69.3739
25	13.2710	70	35.7762	115	53.8707	160	63.9354	25	14.3572	70	38.7591	115	58.4787	160	69.5019
26	13.8015	71	36.2438	116	54.1909	161	64.0375	26	14.9315	71	39.2672	116	58.8287	161	69.6140
27	14.3201	72	36.6990	117	54.5115	162	64.1396	27	15.4928	72	39.7621	117	59.1793	162	69.7261
28	14.8452	73	37.1614	118	54.8326	163	64.2419	28	16.0612	73	40.2649	118	59.5303	163	69.8383
29	15.3642	74	37.6180	119	55.1401	164	64.3295	29	16.6234	74	40.7613	119	59.8667	164	69.9345
30	15.8905	75	38.0753	120	55.4481	165	64.4172	30	17.1928	75	41.2586	120	60.2035	165	70.0308
31	16.4106	76	38.5202	121	55.7495	166	64.4976	31	17.7559	76	41.7425	121	60.5332	166	70.1190
32	16.9311	77	38.9724	122	56.0513	167	64.5781	32	18.3195	77	42.2343	122	60.8634	167	70.2074
33	17.4521	78	39.4186	123	56.3465	168	64.6439	33	18.8833	78	42.7198	123	61.1863	168	70.2796
34	17.9735	79	39.8590	124	56.6351	169	64.7098	34	19.4483	79	43.1990	124	61.5020	169	70.3520
35	18.4892	80	40.3067	125	56.9240	170	64.7684	35	20.0068	80	43.6861	125	61.8182	170	70.4163
36	19.0053	81	40.7419	126	57.2063	171	64.8197	36	20.5658	81	44.1597	126	62.1271	171	70.4725
37	19.5219	82	41.1777	127	57.4818	172	64.8709	37	21.1250	82	44.6341	127	62.4287	172	70.5288
38	20.0390	83	41.6143	128	57.7577	173	64.9076	38	21.6855	83	45.1093	128	62.7307	173	70.5691
39	20.5504	84	42.0515	129	58.0198	174	64.9442	39	22.2395	84	45.5853	129	63.0177	174	70.6093
40	21.0622	85	42.4695	130	58.2893	175	64.9735	40	22.7940	85	46.0405	130	63.3127	175	70.6415
41	21.5746	86	42.8948	131	58.5520	176	64.9955	41	23.3492	86	46.5036	131	63.6004	176	70.6656
42	22.0875	87	43.3204	132	58.8008	177	65.0175	42	23.9050	87	46.9676	132	63.8729	177	70.6898
43	22.5947	88	43.7407	133	59.0500	178	65.0322	43	24.4546	88	47.4250	133	64.1458	178	70.7059

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

125 keV								130 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
44	23.1022	89	44.1614	134	59.2994	179	65.0395	44	25.0049	89	47.8833	134	64.4190	179	70.7139
45	23.6045	90	44.5760	135	59.5348	180	65.0420	45	25.5490	90	48.3351	135	64.6769	180	70.7220

135 keV								140 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.6205	46	28.1690	91	52.7456	136	70.3596	1	0.6674	46	30.3188	91	56.8830	136	76.0341
2	1.2411	47	28.7586	92	53.2304	137	70.6336	2	1.3348	47	30.9545	92	57.4087	137	76.3329
3	1.8689	48	29.3490	93	53.7081	138	70.8994	3	2.0099	48	31.5911	93	57.9267	138	76.6228
4	2.4896	49	29.9328	94	54.1867	139	71.1655	4	2.6775	49	32.2206	94	58.4459	139	76.9131
5	3.1104	50	30.5248	95	54.6582	140	71.4233	5	3.3451	50	32.8591	95	58.9573	140	77.1943
6	3.7313	51	31.1103	96	55.1306	141	71.6815	6	4.0128	51	33.4905	96	59.4698	141	77.4760
7	4.3523	52	31.6966	97	55.6038	142	71.9313	7	4.6807	52	34.1229	97	59.9833	142	77.7486
8	4.9734	53	32.2763	98	56.0619	143	72.1728	8	5.3488	53	34.7483	98	60.4805	143	78.0121
9	5.6018	54	32.8568	99	56.5208	144	72.4059	9	6.0247	54	35.3746	99	60.9785	144	78.2665
10	6.2233	55	33.4308	100	56.9725	145	72.6393	10	6.6931	55	35.9940	100	61.4688	145	78.5212
11	6.8378	56	34.0131	101	57.4250	146	72.8643	11	7.3541	56	36.6223	101	61.9601	146	78.7668
12	7.4597	57	34.5888	102	57.8702	147	73.0809	12	8.0230	57	37.2437	102	62.4436	147	79.0032
13	8.0818	58	35.1579	103	58.3162	148	73.2890	13	8.6921	58	37.8580	103	62.9280	148	79.2304
14	8.6970	59	35.7278	104	58.7549	149	73.4974	14	9.3539	59	38.4733	104	63.4045	149	79.4570
15	9.3197	60	36.2987	105	59.1863	150	73.6972	15	10.0237	60	39.0896	105	63.8731	150	79.6760
16	9.9426	61	36.8630	106	59.6185	151	73.8885	16	10.6939	61	39.6989	106	64.3426	151	79.8849
17	10.5587	62	37.4282	107	60.0432	152	74.0713	17	11.3562	62	40.3093	107	64.8041	152	80.0846
18	11.1752	63	37.9867	108	60.4687	153	74.2630	18	12.0198	63	40.9125	108	65.2665	153	80.2939
19	11.7919	64	38.5537	109	60.8868	154	74.4287	19	12.6834	64	41.5250	109	65.7209	154	80.4748
20	12.4091	65	39.1141	110	61.2973	155	74.6032	20	13.3474	65	42.1304	110	66.1672	155	80.6654
21	13.0266	66	39.6679	111	61.7086	156	74.7604	21	14.0119	66	42.7287	111	66.6144	156	80.8371
22	14.1622	67	40.2225	112	62.1124	157	74.9177	22	15.2338	67	43.3281	112	67.0534	157	81.0090
23	14.2557	68	40.7781	113	62.5086	158	75.0664	23	15.3344	68	43.9286	113	67.4843	158	81.1714
24	14.8745	69	41.3271	114	62.9055	159	75.2065	24	16.0004	69	44.5219	114	67.9160	159	81.3244
25	15.4865	70	41.8693	115	63.3031	160	75.3466	25	16.6591	70	45.1081	115	68.3484	160	81.4775
26	16.1063	71	42.4201	116	63.6848	161	75.4693	26	17.3261	71	45.7036	116	68.7636	161	81.6116
27	16.7121	72	42.9566	117	64.0670	162	75.5921	27	17.9781	72	46.2837	117	69.1796	162	81.7457
28	17.3256	73	43.5017	118	64.4500	163	75.7150	28	18.6385	73	46.8732	118	69.5963	163	81.8800
29	17.9324	74	44.0400	119	64.8169	164	75.8203	29	19.2918	74	47.4555	119	69.9956	164	81.9951
30	18.5470	75	44.5794	120	65.1843	165	75.9257	30	19.9534	75	48.0389	120	70.3956	165	82.1103
31	19.1550	76	45.1042	121	65.5440	166	76.0224	31	20.6079	76	48.6067	121	70.7871	166	82.2159
32	19.7635	77	45.6377	122	65.9043	167	76.1191	32	21.2631	77	49.1840	122	71.1794	167	82.3216
33	20.3726	78	46.1644	123	66.2568	168	76.1983	33	21.9190	78	49.7540	123	71.5632	168	82.4082
34	20.9823	79	46.6843	124	66.6014	169	76.2775	34	22.5755	79	50.3167	124	71.9385	169	82.4947
35	21.5853	80	47.2130	125	66.9465	170	76.3479	35	23.2250	80	50.8889	125	72.3144	170	82.5717
36	22.1890	81	47.7270	126	67.2838	171	76.4096	36	23.8752	81	51.4454	126	72.6817	171	82.6390
37	22.7934	82	48.2419	127	67.6131	172	76.4712	37	24.5261	82	52.0030	127	73.0404	172	82.7064
38	23.3984	83	48.7578	128	67.9429	173	76.5153	38	25.1778	83	52.5617	128	73.3998	173	82.7546
39	23.9968	84	49.2747	129	68.2562	174	76.5593	39	25.8225	84	53.1215	129	73.7412	174	82.8028
40	24.5950	85	49.7689	130	68.5785	175	76.5946	40	26.4679	85	53.6569	130	74.0924	175	82.8413
41	25.1956	86	50.2719	131	68.8927	176	76.6211	41	27.1142	86	54.2019	131	74.4349	176	82.8702
42	25.7960	87	50.7759	132	69.1904	177	76.6475	42	27.7613	87	54.7479	132	74.7594	177	82.8991
43	26.3901	88	51.2729	133	69.4885	178	76.6651	43	28.4014	88	55.2865	133	75.0843	178	82.9184
44	26.9847	89	51.7708	134	69.7870	179	76.6742	44	29.0423	89	55.8262	134	75.4098	179	82.9280
45	27.5728	90	52.2617	135	70.0688	180	76.6828	45	29.6762	90	56.3584	135	75.7170	180	82.9377

145 keV								150 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.7159	46	32.5506	91	61.1952	136	81.9732	1	0.7661	46	34.8646	91	65.6851	136	88.1841
2	1.4318	47	33.2342	92	61.7639	137	82.2984	2	1.5323	47	35.5981	92	66.2992	137	88.5374
3	2.1561	48	33.9189	93	62.3245	138	82.6140	3	2.3073	48	36.3329	93	66.9045	138	88.8802
4	2.8721	49	34.5961	94	62.8863	139	82.9299	4	3.0737	49	37.0596	94	67.5112	139	89.2236
5	3.5883	50	35.2829	95	63.4399	140	83.2362	5	3.8401	50	37.7969	95	68.1092	140	89.5564
6	4.3046	51	35.9623	96	63.9947	141	83.5428	6	4.6067	51	38.5262	96	68.7085	141	89.8896
7	5.0211	52	36.6428	97	64.5507	142	83.8396	7	5.3735	52	39.2567	97	69.3093	142	90.2123
8	5.7378	53	37.3158	98	65.0890	143	84.1266	8	6.1405	53	39.9794	98	69.8909	143	90.5243

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

145 keV								150 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
9	6.4629	54	37.9899	99	65.6284	144	84.4037	9	6.9165	54	40.7033	99	70.4740	144	90.8255
10	7.1800	55	38.6566	100	66.1595	145	84.6812	10	7.6840	55	41.4193	100	71.0480	145	91.1272
11	7.8891	56	39.3330	101	66.6917	146	84.9487	11	8.4430	56	42.1459	101	71.6234	146	91.4180
12	8.6068	57	40.0020	102	67.2155	147	85.2062	12	9.2112	57	42.8645	102	72.1898	147	91.6981
13	9.3248	58	40.6635	103	67.7404	148	85.4538	13	9.9797	58	43.5752	103	72.7575	148	91.9673
14	10.0348	59	41.3261	104	68.2568	149	85.7016	14	10.7394	59	44.2872	104	73.3161	149	92.2368
15	10.7535	60	41.9900	105	68.7648	150	85.9393	15	11.5092	60	45.0007	105	73.8655	150	92.4954
16	11.4726	61	42.6463	106	69.2738	151	86.1670	16	12.2788	61	45.7061	106	74.4162	151	92.7431
17	12.1838	62	43.3039	107	69.7742	152	86.3845	17	13.0402	62	46.4129	107	74.9577	152	92.9797
18	12.8955	63	43.9539	108	70.2756	153	86.6126	18	13.8020	63	47.1117	108	75.5004	153	93.2279
19	13.6076	64	44.6139	109	70.7684	154	86.8099	19	14.5645	64	47.8214	109	76.0339	154	93.4425
20	14.3202	65	45.2664	110	71.2526	155	87.0177	20	15.3274	65	48.5230	110	76.5580	155	93.6686
21	15.0333	66	45.9113	111	71.7377	156	87.2048	21	16.0910	66	49.2166	111	77.0832	156	93.8723
22	16.3449	67	46.5574	112	72.2141	157	87.3922	22	17.4955	67	49.9117	112	77.5991	157	94.0762
23	16.4529	68	47.2049	113	72.6816	158	87.5693	23	17.6111	68	50.6082	113	78.1055	158	94.2689
24	17.1677	69	47.8447	114	73.1501	159	87.7361	24	18.3766	69	51.2966	114	78.6130	159	94.4505
25	17.8748	70	48.4769	115	73.6196	160	87.9031	25	19.1339	70	51.9769	115	79.1215	160	94.6322
26	18.5909	71	49.1192	116	74.0703	161	88.0492	26	19.9009	71	52.6683	116	79.6099	161	94.7913
27	19.2910	72	49.7450	117	74.5219	162	88.1955	27	20.6507	72	53.3419	117	80.0993	162	94.9506
28	20.0000	73	50.3810	118	74.9744	163	88.3419	28	21.4103	73	54.0266	118	80.5898	163	95.1099
29	20.7015	74	51.0093	119	75.4081	164	88.4675	29	22.1617	74	54.7031	119	81.0598	164	95.2466
30	21.4120	75	51.6389	120	75.8425	165	88.5931	30	22.9229	75	55.3812	120	81.5308	165	95.3834
31	22.1149	76	52.2518	121	76.2679	166	88.7083	31	23.6759	76	56.0413	121	81.9920	166	95.5088
32	22.8185	77	52.8750	122	76.6941	167	88.8236	32	24.4299	77	56.7126	122	82.4542	167	95.6341
33	23.5230	78	53.4905	123	77.1111	168	88.9180	33	25.1848	78	57.3756	123	82.9065	168	95.7316
34	24.2282	79	54.9081	124	77.5189	169	89.0124	34	25.9406	79	58.0304	124	83.3488	169	95.8397
35	24.9259	80	54.7161	125	77.9275	170	89.0963	35	26.6883	80	58.6964	125	83.7921	170	95.9314
36	25.6245	81	55.3172	126	78.3268	171	89.1698	36	27.4370	81	59.3443	126	84.2253	171	96.0114
37	26.3238	82	55.9196	127	78.7168	172	89.2434	37	28.1868	82	59.9936	127	84.6485	172	96.0919
38	27.0241	83	56.5232	128	79.1075	173	89.2959	38	28.9375	83	60.6445	128	85.0725	173	96.1486
39	27.7169	84	57.1281	129	79.4788	174	89.3484	39	29.6802	84	61.2968	129	85.4754	174	96.2059
40	28.4106	85	57.7068	130	79.8607	175	89.3905	40	30.4240	85	61.9209	130	85.8900	175	96.2517
41	29.1052	86	58.2958	131	80.2332	176	89.4420	41	31.1689	86	62.5563	131	86.2945	176	96.2860
42	29.8008	87	58.8862	132	80.5862	177	89.4536	42	31.9148	87	63.1931	132	86.6777	177	96.3203
43	30.4886	88	59.4685	133	80.9397	178	89.4746	43	32.6528	88	63.8215	133	87.0616	178	96.3433
44	31.1779	89	60.0521	134	81.2938	179	89.4851	44	33.3920	89	64.4513	134	87.4461	179	96.3547
45	31.8595	90	60.6277	135	81.6282	180	89.4956	45	34.1231	90	65.0725	135	87.8093	180	96.3662

155 keV								160 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.8180	46	37.2613	91	70.3557	136	94.6744	1	0.8717	46	39.7412	91	75.2101	136	101.4522
2	1.6361	47	38.0467	92	71.0174	137	95.0576	2	1.7434	47	40.5804	92	75.9218	137	101.8672
3	2.4637	48	38.8335	93	71.6698	138	95.4294	3	2.6253	48	41.4212	93	76.6237	138	102.2699
4	3.2820	49	39.6118	94	72.3238	139	95.8019	4	3.4972	49	42.2531	94	77.3274	139	102.6734
5	4.1004	50	40.4014	95	72.9684	140	96.1629	5	4.3693	50	43.0972	95	78.0212	140	103.0645
6	4.9190	51	41.1827	96	73.6147	141	96.5245	6	5.2416	51	43.9324	96	78.7169	141	103.4562
7	5.7378	52	41.9654	97	74.2626	142	96.8747	7	6.1141	52	44.7693	97	79.4143	142	103.8356
8	6.5569	53	42.7396	98	74.8900	143	97.2132	8	6.9869	53	45.5973	98	80.0899	143	104.2024
9	7.3856	54	43.5154	99	75.5189	144	97.5402	9	7.8701	54	46.4270	99	80.7672	144	104.5568
10	8.2052	55	44.2827	100	76.1383	145	97.8676	10	8.7435	55	47.2477	100	81.4344	145	104.9117
11	9.0158	56	45.0616	101	76.7592	146	98.1834	11	9.6073	56	48.0809	101	82.1032	146	105.2539
12	9.8361	57	45.8320	102	77.3705	147	98.4874	12	10.4816	57	48.9052	102	82.7619	147	105.5835
13	10.6569	58	46.5939	103	77.9833	148	98.7797	13	11.3564	58	49.7205	103	83.4222	148	105.9004
14	11.4686	59	47.3574	104	78.5864	149	99.0724	14	12.2216	59	50.5376	104	84.0722	149	106.2177
15	12.2903	60	48.1225	105	79.1797	150	99.3532	15	13.0974	60	51.3565	105	84.7118	150	106.5222
16	13.1125	61	48.8791	106	79.7744	151	99.6222	16	13.9737	61	52.1665	106	85.3530	151	106.8139
17	13.9258	62	49.6374	107	80.3593	152	99.8792	17	14.8407	62	52.9783	107	85.9837	152	107.0927
18	14.7396	63	50.3871	108	80.9456	153	100.1482	18	15.7082	63	53.7811	108	86.6159	153	107.3851
19	15.5541	64	51.1486	109	81.5219	154	100.3813	19	16.5765	64	54.5966	109	87.2376	154	107.6379
20	16.3692	65	51.9016	110	82.0883	155	100.6275	20	17.4455	65	55.4032	110	87.8486	155	107.9044
21	17.1849	66	52.6460	111	82.6560	156	100.8487	21	18.3152	66	56.2007	111	88.4612	156	108.1445
22	18.6856	67	53.3921	112	83.2136	157	101.0708	22	19.9152	67	57.0001	112	89.0629	157	108.3848

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

155 keV								160 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
23	18.8091	68	54.1399	113	83.7611	158	101.2791	23	20.0470	68	57.8014	113	89.6538	158	108.6122
24	19.6271	69	54.8791	114	84.3098	159	101.4772	24	20.9193	69	58.5937	114	90.2462	159	108.8261
25	20.4364	70	55.6097	115	84.8598	160	101.6722	25	21.7823	70	59.3768	115	90.8399	160	109.0404
26	21.2560	71	56.3523	116	85.3880	161	101.8470	26	22.6564	71	60.1729	116	91.4103	161	109.2281
27	22.0574	72	57.0759	117	85.9174	162	102.0202	27	23.5112	72	60.9488	117	91.9821	162	109.4159
28	22.8693	73	57.8116	118	86.4480	163	102.1931	28	24.3771	73	61.7377	118	92.5552	162	109.6039
29	23.6724	74	58.5386	119	86.9566	164	102.3422	29	25.2339	74	62.5175	119	93.1047	164	109.7651
30	24.4862	75	59.2673	120	87.4664	165	102.4914	30	26.1020	75	63.2992	120	93.6554	165	109.9265
31	25.2913	76	59.9769	121	87.9656	166	102.6276	31	26.9610	76	64.0605	121	94.1949	166	110.0745
32	26.0974	77	60.6986	122	88.4658	167	102.7639	32	27.8211	77	64.8349	122	94.7356	167	110.2227
33	26.9045	78	61.4115	123	88.9555	168	102.8756	33	28.6823	78	65.6000	123	95.2649	168	110.3439
34	27.7127	79	62.1156	124	89.4345	169	102.9874	34	29.5448	79	66.3558	124	95.7827	169	110.4653
35	28.5124	80	62.8319	125	89.9145	170	103.0868	35	30.3983	80	67.1249	125	96.3017	170	110.5732
36	29.3131	81	63.5289	126	90.3837	171	103.1738	36	31.2530	81	67.8733	126	96.8091	171	110.6677
37	30.1151	82	64.2275	127	90.8422	172	103.2608	37	32.1090	82	68.6235	127	97.3049	172	110.7622
38	30.9181	83	64.9278	128	91.3015	173	103.3230	38	32.9663	83	69.3758	128	97.8017	173	110.8297
39	31.7127	84	65.6299	129	91.7381	174	103.3852	39	33.8147	84	70.1299	129	98.2741	174	110.8972
40	32.5085	85	66.3016	130	92.1874	175	103.4350	40	34.6644	85	70.8517	130	98.7602	175	110.9513
41	33.3055	86	66.9857	131	92.6257	176	103.4724	41	35.5155	86	71.5868	131	99.2345	176	110.9918
42	34.1038	87	67.6714	132	93.0411	177	103.5097	42	36.3681	87	72.3238	132	99.6840	177	111.0324
43	34.8937	88	68.3481	133	93.4573	178	103.5346	43	37.2117	88	73.0513	133	100.1345	178	111.0594
44	35.6848	89	69.0265	134	93.8742	179	103.5471	44	38.0568	89	73.7806	134	100.5858	179	111.0730
45	36.4675	90	69.6957	135	94.2680	180	103.5595	45	38.8930	90	74.5002	135	101.0122	180	111.0865

165 keV								170 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	0.9270	46	42.3046	91	80.2515	136	108.5261	1	0.9840	46	44.9521	91	85.4835	136	115.9053
2	1.8541	47	43.1997	92	81.0159	137	108.9749	2	1.9682	47	45.9052	92	86.3031	137	116.3899
3	2.7919	48	44.0967	93	81.7698	138	109.4104	3	2.9637	48	46.8603	93	87.1116	138	116.8604
4	3.7192	49	44.9842	94	82.5258	139	109.8468	4	3.9481	49	47.8055	94	87.9226	139	117.3317
5	4.6467	50	45.8848	95	83.2712	140	110.2699	5	4.9327	50	48.7648	95	88.7223	140	117.7888
6	5.5744	51	46.7761	96	84.0188	141	110.6937	6	5.9175	51	49.7142	96	89.5245	141	118.2468
7	6.5024	52	47.6692	97	84.7684	142	111.1042	7	6.9026	52	50.6658	97	90.3290	142	118.6904
8	7.4307	53	48.5530	98	85.4947	143	111.2012	8	7.8881	53	51.6075	98	91.1086	143	119.1195
9	8.3700	54	49.4387	99	86.2229	144	111.8847	9	8.8853	54	52.5514	99	91.8904	144	119.5344
10	9.2990	55	50.3150	100	86.9404	145	112.2688	10	9.8716	55	53.4854	100	92.6608	145	119.9492
11	10.2176	56	51.2047	101	87.6598	146	112.6393	11	10.8471	56	54.4338	101	93.4335	146	120.3498
12	11.1477	57	52.0850	102	88.3683	147	112.9961	12	11.8344	57	55.3724	102	94.1945	147	120.7356
13	12.0782	58	52.9559	103	89.0788	148	113.3392	13	12.8224	58	56.3010	103	94.9578	148	121.1065
14	12.9986	59	53.8288	104	89.7782	149	113.6828	14	13.7996	59	57.2319	104	95.7194	149	121.4781
15	13.9302	60	54.7037	105	90.4666	150	114.0125	15	14.7889	60	58.1651	105	96.4492	150	121.8348
16	14.8625	61	55.5692	106	91.1568	151	114.3284	16	15.7789	61	59.0884	106	97.1911	151	122.1764
17	15.7848	62	56.4368	107	91.8358	152	114.6303	17	16.7580	62	60.0141	107	97.9211	152	122.5032
18	16.7079	63	57.2949	108	92.5167	153	114.9470	18	17.7386	63	60.9297	108	98.6532	153	122.8457
19	17.6317	64	58.1668	109	93.1862	154	115.2209	19	18.7198	64	61.8602	109	99.3733	154	123.1422
20	18.5563	65	59.0291	110	93.8444	155	115.5096	20	19.7018	65	62.7807	110	100.0813	155	123.4543
21	19.4818	66	59.8820	111	94.5043	156	115.7697	21	20.6849	66	63.6912	111	100.7912	156	123.7358
22	21.1846	67	60.7369	112	95.1527	157	116.0301	22	22.4936	67	64.6041	112	101.4889	157	124.0176
23	21.3248	68	61.5941	113	95.7895	158	116.2763	23	22.6426	68	65.5195	113	102.1742	158	124.2841
24	22.2532	69	62.4417	114	96.4279	159	116.5083	24	23.6289	69	66.4248	114	102.8614	159	124.5352
25	23.1718	70	63.2797	115	97.0681	160	116.7405	25	24.6048	70	67.3200	115	103.5505	160	124.7865
26	24.1022	71	64.1317	116	97.6831	161	116.9439	26	25.5930	71	68.2303	116	104.2127	161	125.0067
27	25.0121	72	64.9621	117	98.2996	162	117.1475	27	26.5603	72	69.1178	117	104.8766	162	125.2271
28	25.9340	73	65.8067	118	98.9177	163	117.3512	28	27.5400	73	70.0204	118	105.5424	163	125.4477
29	26.8462	74	66.6416	119	99.5105	164	117.5260	29	28.5095	74	70.9129	119	106.1809	164	125.6369
30	27.7705	75	67.4787	120	100.1047	165	117.7010	30	29.4918	75	71.8079	120	106.8214	165	125.8263
31	28.6852	76	68.2941	121	100.6868	166	117.8614	31	30.4641	76	72.6798	121	107.4483	166	126.0001
32	29.6011	77	69.1237	122	101.2702	167	118.0220	32	31.4378	77	73.5670	122	108.0771	167	126.1743
33	30.5184	78	69.9434	123	101.8415	168	118.1535	33	32.4130	78	74.4439	123	108.6929	168	126.3163
34	31.4371	79	70.7533	124	102.4005	169	118.2851	34	33.3897	79	75.3104	124	109.2955	169	126.4588
35	32.3462	80	71.5776	125	102.9609	170	118.4021	35	34.3564	80	76.1924	125	109.8997	170	126.5855
36	33.2568	81	72.3798	126	103.5088	171	118.5045	36	35.3247	81	77.0509	126	110.4905	171	126.6964

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

165 keV								170 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
37	34.1688	82	73.1841	127	104.0442	172	118.6070	37	36.2947	82	77.9119	127	111.0682	172	126.8074
38	35.0823	83	73.9907	128	104.5809	173	118.6802	38	37.2663	83	78.7755	128	111.6469	173	126.8867
39	35.9863	84	74.7996	129	105.0911	174	118.7534	39	38.2280	84	79.6416	129	112.1974	174	126.9662
40	36.8919	85	75.5738	130	105.6163	175	118.8120	40	39.1914	85	80.4707	130	112.7641	175	127.0295
41	37.7991	86	76.3624	131	106.1289	176	118.8560	41	40.1567	86	81.3155	131	113.3172	176	127.0772
42	38.7079	87	77.1533	132	106.6147	177	118.9000	42	41.1238	87	82.1627	132	113.8415	177	127.1248
43	39.6073	88	77.9339	133	107.1015	178	118.9293	43	42.0809	88	82.9992	133	114.3671	178	127.1566
44	40.5084	89	78.7162	134	107.5894	179	118.9440	44	43.0400	89	83.8382	134	114.8938	179	127.1724
45	41.4000	90	79.4893	135	108.0503	180	118.9586	45	43.9891	90	84.6663	135	115.3914	180	127.1883

175 keV								180 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	1.0428	46	47.6841	91	90.9096	136	123.5993	1	1.1032	46	50.5012	91	96.5336	136	131.6184
2	2.0856	47	48.6972	92	91.7872	137	124.1221	2	2.206	47	51.5765	92	97.4721	137	132.1818
3	3.1406	48	49.7126	93	92.6531	138	124.6296	3	3.3221	48	52.6543	93	98.3982	138	132.7288
4	4.1838	49	50.7176	94	93.5217	139	125.1383	4	4.4263	49	53.7213	94	99.3274	139	133.2771
5	5.2271	50	51.7377	95	94.3786	140	125.6315	5	5.5302	50	54.8044	95	100.2443	140	133.8088
6	6.2708	51	52.7475	96	95.2381	141	126.1258	6	6.6344	51	55.8767	96	101.1641	141	134.3418
7	7.3148	52	53.7597	97	96.1004	142	126.6046	7	7.7389	52	56.9517	97	102.0870	142	134.8580
8	8.3592	53	54.7615	98	96.9360	143	127.0678	8	8.8440	53	58.0159	98	102.9816	143	135.3576
9	9.4160	54	55.7658	99	97.7742	144	127.5154	9	9.9622	54	59.0828	99	103.8792	144	135.8403
10	10.4613	55	56.7597	100	98.6003	145	127.9637	10	11.0682	55	60.1389	100	104.7639	145	136.3239
11	11.4952	56	57.7691	101	99.4290	146	128.3963	11	12.1622	56	61.2115	101	105.6516	146	136.7906
12	12.5417	57	58.7681	102	100.2455	147	128.8130	12	13.2696	57	62.2733	102	106.5262	147	137.2401
13	13.5889	58	59.7567	103	101.0644	148	129.2137	13	14.3777	58	63.3242	103	107.4038	148	137.6725
14	14.6247	59	60.7479	104	101.8709	149	129.6151	14	15.4739	59	64.3781	104	108.2682	149	138.1057
15	15.6734	60	61.7418	105	102.6649	150	130.0004	15	16.5837	60	65.4348	105	109.1193	150	138.5215
16	16.7229	61	62.7252	106	103.4614	151	130.3695	16	17.6945	61	66.4807	106	109.9732	151	138.9200
17	17.7612	62	63.7112	107	104.2451	152	130.7224	17	18.7934	62	67.5295	107	110.8137	152	139.3009
18	18.8005	63	64.6868	108	105.0313	153	131.0927	18	19.8934	63	68.5674	108	111.6569	153	139.7007
19	19.8407	64	65.6783	109	105.8047	154	131.4130	19	20.9946	64	69.6224	109	112.4865	154	140.0465
20	20.8820	65	66.6593	110	106.5652	155	131.7506	20	22.0968	65	70.6664	110	113.3025	155	140.4110
21	21.9244	66	67.6298	111	107.3279	156	132.0548	21	23.2003	66	71.6994	111	114.1210	156	140.7395
22	23.8425	67	68.6031	112	108.0777	157	132.3595	22	25.2311	67	72.7355	112	114.9257	157	141.0686
23	24.0005	68	69.5792	113	108.8142	158	132.6476	23	25.3984	68	73.7747	113	115.7164	158	141.3797
24	25.0464	69	70.5446	114	109.5530	159	132.9190	24	26.5059	69	74.8029	114	116.5096	159	141.6729
25	26.0816	70	71.4995	115	110.2938	160	133.1908	25	27.6021	70	75.8198	115	117.3052	160	141.9665
26	27.1302	71	72.4706	116	111.0059	161	133.4289	26	28.7126	71	76.8543	116	118.0700	161	142.2237
27	28.1559	72	73.4175	117	111.7200	162	133.6672	27	29.7989	72	77.8632	117	118.8372	162	142.4811
28	29.1952	73	74.3808	118	112.4361	163	133.9058	28	30.8997	73	78.8898	118	119.6066	163	142.7389
29	30.2237	74	75.3333	119	113.1231	164	134.1104	29	31.9892	74	79.9050	119	120.3448	164	142.9600
30	31.2661	75	76.2888	120	113.8119	165	134.3153	30	33.0933	75	80.9236	120	121.0852	165	143.1813
31	32.2978	76	77.2197	121	114.4870	166	134.5032	31	34.1865	76	81.9162	121	121.8108	166	143.3844
32	33.3311	77	78.1672	122	115.1638	167	134.6913	32	35.2814	77	82.9266	122	122.5386	167	143.5877
33	34.3661	78	79.1038	123	115.8268	168	134.8453	33	36.3781	78	83.9255	123	123.2515	168	143.7541
34	35.4029	79	80.0295	124	116.4757	169	134.9994	34	37.4768	79	84.9130	124	123.9494	169	143.9207
35	36.4291	80	80.9718	125	117.1263	170	135.1365	35	38.5644	80	85.9185	125	124.6492	170	144.0688
36	37.4571	81	81.8893	126	117.7627	171	135.2565	36	39.6541	81	86.8976	126	125.3339	171	144.1985
37	38.4869	82	82.8096	127	118.3848	172	135.3766	37	40.7458	82	87.8799	127	126.0033	172	144.3283
38	39.5187	83	83.7327	128	119.0084	173	135.4624	38	41.8397	83	88.8654	128	126.6745	173	144.4210
39	40.5400	84	84.6588	129	119.6016	174	135.5482	39	42.9226	84	89.8542	129	127.3130	174	144.5138
40	41.5633	85	85.5455	130	120.2124	175	135.6169	40	44.0077	85	90.8012	130	127.9704	175	144.5880
41	42.5880	86	86.4490	131	120.8085	176	135.6684	41	45.0951	86	91.7664	131	128.6123	176	144.6437
42	43.6159	87	87.3554	132	121.3738	177	135.7200	42	46.1848	87	92.7347	132	129.2210	177	144.6995
43	44.6329	88	88.2505	133	121.9404	178	135.7543	43	47.2636	88	93.6911	133	129.8312	178	144.7366
44	45.6520	89	89.1484	134	122.5083	179	135.7715	44	48.3448	89	94.6507	134	130.4430	179	144.7552
45	46.6606	90	90.0348	135	123.0450	180	135.7887	45	49.4151	90	95.5983	135	131.0212	180	144.7738

185 keV								190 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	1.1654	46	53.40392	91	102.3595	136	139.9735	1	1.2292	46	56.3927	91	108.3914	136	148.6763

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

185 keV								190 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
2	2.3308	47	54.5434	92	103.3618	137	140.5801	2	2.4585	47	57.5987	92	109.4607	137	149.3287
3	3.5098	48	55.6859	93	104.3512	138	141.1690	3	3.7021	48	58.8080	93	110.5164	138	149.9623
4	4.6757	49	56.8170	94	105.3440	139	141.7594	4	4.9319	49	60.0054	94	111.5760	139	150.5975
5	5.8418	50	57.9653	95	106.3238	140	142.3322	5	6.1619	50	61.2213	95	112.6219	140	151.2138
6	7.0082	51	59.1024	96	107.3072	141	142.9062	6	7.3923	51	62.4254	96	113.6716	141	151.8316
7	8.1751	52	60.2425	97	108.2937	142	143.4624	7	8.6232	52	63.6330	97	114.7253	142	152.4303
8	9.3424	53	61.3713	98	109.2503	143	144.0006	8	9.8546	53	64.8287	98	115.7471	143	153.0097
9	10.5238	54	62.5032	99	110.2102	144	144.5207	9	11.1008	54	66.0278	99	116.7726	144	153.5697
10	11.6923	55	63.6237	100	111.1566	145	145.0420	10	12.3335	55	67.2151	100	117.7839	145	154.1309
11	12.8481	56	64.7620	101	112.1063	146	145.5449	11	13.5529	56	68.4215	101	118.7989	146	154.6726
12	14.0181	57	65.8889	102	113.0423	147	146.0295	12	14.7873	57	69.6160	102	119.7994	147	155.1945
13	15.1889	58	67.0045	103	113.9815	148	146.4957	13	16.0225	58	70.7986	103	120.8036	148	155.6966
14	16.3472	59	68.1233	104	114.9069	149	146.9627	14	17.2446	59	71.9849	104	121.7932	149	156.1997
15	17.5199	60	69.2455	105	115.8182	150	147.4111	15	18.4820	60	73.1749	105	122.7679	150	156.6828
16	18.6937	61	70.3562	106	116.7327	151	147.8408	16	19.7206	61	74.3529	106	123.7462	151	157.1458
17	19.8551	62	71.4703	107	117.6330	152	148.2517	17	20.9461	62	75.5348	107	124.7096	152	157.5886
18	21.0176	63	72.5729	108	118.5363	153	148.6828	18	22.1729	63	76.7046	108	125.6763	153	158.0533
19	22.1814	64	73.6939	109	119.4253	154	149.0558	19	23.4011	64	77.8942	109	126.6280	154	158.4553
20	23.3464	65	74.8034	110	120.2998	155	149.4491	20	24.6308	65	79.0718	110	127.5642	155	158.8792
21	24.5129	66	75.9014	111	121.1772	156	149.8036	21	25.8620	66	80.2374	111	128.5038	156	159.2614
22	26.6596	67	77.0028	112	122.0400	157	150.1586	22	28.1281	67	81.4068	112	129.4278	157	159.6441
23	26.8365	68	78.1078	113	122.8879	158	150.4943	23	28.3149	68	82.5803	113	130.3361	158	160.0061
24	28.0075	69	79.2012	114	123.7386	159	150.8107	24	29.5511	69	83.7416	114	131.2476	159	160.3473
25	29.1664	70	80.2829	115	124.5921	160	151.1276	25	30.7747	70	84.8907	115	132.1622	160	160.6890
26	30.3407	71	81.3835	116	125.4126	161	151.4051	26	32.0146	71	86.0601	116	133.0418	161	160.9884
27	31.4894	72	82.4570	117	126.2358	162	151.6830	27	33.2277	72	87.2009	117	133.9243	162	161.2881
28	32.6536	73	83.5495	118	127.0617	163	151.9613	28	34.4571	73	88.3621	118	134.8098	163	161.5882
29	33.8060	74	84.6302	119	127.8541	164	152.2000	29	35.6742	74	89.5110	119	135.6597	164	161.8457
30	34.9740	75	85.7145	120	128.6491	165	152.4390	30	36.9080	75	90.6640	120	136.5123	165	162.1035
31	36.1303	76	86.7714	121	129.4283	166	152.6582	31	38.1294	76	91.7880	121	137.3483	166	162.3400
32	37.2886	77	87.8475	122	130.2100	167	152.8777	32	39.3532	77	92.9326	122	138.1870	167	162.5768
33	38.4491	78	88.9116	123	130.9758	168	153.0574	33	40.5793	78	94.0648	123	139.0089	168	162.7707
34	39.6117	79	89.9637	124	131.7256	169	153.2372	34	41.8078	79	95.1843	124	139.8137	169	162.9647
35	40.7627	80	91.0351	125	132.4776	170	153.3972	35	43.0242	80	96.3246	125	140.6211	170	163.1373
36	41.9160	81	92.0787	126	133.2135	171	153.5373	36	44.2431	81	97.4355	126	141.4113	171	163.2885
37	43.0716	82	93.1258	127	133.9331	172	153.6774	37	45.4646	82	98.5504	127	142.1840	172	163.4397
38	44.2297	83	94.1766	128	134.6547	173	153.7776	38	46.6888	83	99.6694	128	142.9591	173	163.5478
39	45.3762	84	95.2311	129	135.3412	174	153.8777	39	47.9010	84	100.7926	129	143.6967	174	163.6559
40	46.5251	85	96.2411	130	136.0483	175	153.9579	40	49.1159	85	101.8687	130	144.4564	175	163.7424
41	47.6767	86	97.2708	131	136.7387	176	154.0181	41	50.3337	86	102.9658	131	145.1984	176	163.8074
42	48.8308	87	98.3040	132	137.3935	177	154.0783	42	51.5544	87	104.0671	132	145.9022	177	163.8723
43	49.9736	88	99.3247	133	138.0501	178	154.1184	43	52.7631	88	105.1551	133	146.6080	178	163.9156
44	51.1190	89	100.3491	134	138.7084	179	154.1384	44	53.9749	89	106.2473	134	147.3158	179	163.9373
45	52.2529	90	101.3607	135	139.3307	180	154.1585	45	55.1747	90	107.3261	135	147.9850	180	163.9589

195 keV								200 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	1.2947	46	59.4681	91	114.6336	136	157.7388	1	1.3620	46	62.6308	91	121.0908	136	167.1743
2	2.5896	47	60.7429	92	115.7732	137	158.4400	2	2.7241	47	63.9766	92	122.3040	137	167.9274
3	3.8996	48	62.0213	93	116.8985	138	159.1211	3	4.1021	48	65.3264	93	123.5023	138	168.6590
4	5.1949	49	63.2873	94	118.0282	139	159.8041	4	5.4648	49	66.6633	94	124.7056	139	169.3927
5	6.4906	50	64.5731	95	119.1435	140	160.4667	5	6.8278	50	68.0213	95	125.8937	140	170.1047
6	7.7866	51	65.8466	96	120.2631	141	161.1311	6	8.1912	51	69.3665	96	127.0867	141	170.8187
7	9.0832	52	67.1238	97	121.3872	142	161.7750	7	9.5553	52	70.7160	97	128.2847	142	171.5108
8	10.3805	53	68.3888	98	122.4774	143	162.3982	8	10.9200	53	72.0526	98	129.4469	143	172.1807
9	11.6933	54	69.6577	99	123.5719	144	163.0007	9	12.3012	54	73.3936	99	130.6139	144	172.8284
10	12.9920	55	70.9141	100	124.6514	145	163.6046	10	13.6675	55	74.7217	100	131.7651	145	173.4777
11	14.2765	56	72.1910	101	125.7351	146	164.1875	11	15.0191	56	76.0716	101	132.9211	146	174.1046
12	15.5770	57	73.4555	102	126.8035	147	164.7492	12	16.3874	57	77.4086	102	134.0610	147	174.7087
13	16.8785	58	74.7076	103	127.8761	148	165.2896	13	17.7569	58	78.7328	103	135.2056	148	175.2901
14	18.1662	59	75.9639	104	128.9333	149	165.8312	14	19.1119	59	80.0616	104	136.3340	149	175.8727
15	19.4700	60	77.2243	105	129.9749	150	166.3514	15	20.4839	60	81.3950	105	137.4460	150	176.4323

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

195 keV								200 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
16	20.7751	61	78.4722	106	131.0205	151	166.8499	16	21.8574	61	82.7155	106	138.5624	151	176.9688
17	22.0666	62	79.7244	107	132.0502	152	167.3267	17	23.2166	62	84.0406	107	139.6622	152	177.4818
18	23.3595	63	80.9641	108	133.0839	153	167.8272	18	24.5774	63	85.3528	108	140.7665	153	178.0205
19	24.6540	64	82.2249	109	134.1016	154	168.2602	19	25.9398	64	86.6876	109	141.8538	154	178.4866
20	25.9500	65	83.4733	110	135.1003	155	168.7168	20	27.3041	65	88.0094	110	142.9240	155	178.9781
21	27.2477	66	84.7091	111	136.1082	156	169.1285	21	28.6702	66	89.3182	111	143.9984	156	179.4213
22	29.6367	67	85.9493	112	137.0969	157	169.5408	22	31.1853	67	90.6319	112	145.0555	157	179.8653
23	29.8335	68	87.1939	113	138.0691	158	169.9309	23	31.3925	68	91.9505	113	146.0951	158	180.2853
24	31.1368	69	88.4259	114	139.0447	159	170.2985	24	32.7648	69	93.2561	114	147.1386	159	180.6813
25	32.4270	70	89.6452	115	140.0240	160	170.6668	25	34.1234	70	94.5483	115	148.1862	160	181.0778
26	33.7345	71	90.8861	116	140.9659	161	170.9894	26	35.5003	71	95.8638	116	149.1940	161	181.4253
27	35.0137	72	92.0971	117	141.9111	162	171.3124	27	36.8476	72	97.1478	117	150.2056	162	181.7733
28	36.3103	73	93.3298	118	142.8598	163	171.6359	28	38.2133	73	98.4551	118	151.2210	163	182.1217
29	37.5940	74	94.5498	119	143.7704	164	171.9135	29	39.5656	74	99.7491	119	152.1959	164	182.4208
30	38.8954	75	95.7744	120	144.6842	165	172.1914	30	40.9366	75	101.0480	120	153.1744	165	182.7201
31	40.1840	76	96.9684	121	145.5802	166	172.4464	31	42.2942	76	102.3153	121	154.1341	166	182.9949
32	41.4751	77	98.1845	122	146.4794	167	172.7017	32	43.6547	77	103.6061	122	155.0973	167	183.2699
33	42.7688	78	99.3876	123	147.3607	168	172.9107	33	45.0180	78	104.8832	123	156.0415	168	183.4952
34	44.0652	79	100.5774	124	148.2238	169	173.1199	34	46.3844	79	106.1466	124	156.9665	169	183.7207
35	45.3490	80	101.7899	125	149.0899	170	173.3061	35	47.7375	80	107.4341	125	157.8947	170	183.9212
36	46.6356	81	102.9711	126	149.9376	171	173.4690	36	49.0938	81	108.6888	126	158.8035	171	184.0969
37	47.9250	82	104.1569	127	150.7668	172	173.6321	37	50.4532	82	109.9485	127	159.6925	172	184.2726
38	49.2175	83	105.3472	128	151.5987	173	173.7487	38	51.8160	83	111.2135	128	160.5846	173	184.3983
39	50.4974	84	106.5423	129	152.3904	174	173.8653	39	53.1657	84	112.4836	129	161.4338	174	184.5239
40	51.7803	85	107.6874	130	153.2060	175	173.9586	40	54.5189	85	113.7010	130	162.3088	175	184.6245
41	53.0665	86	108.8552	131	154.0026	176	174.0286	41	55.8755	86	114.9427	131	163.1636	176	184.7000
42	54.3559	87	110.0276	132	154.7585	177	174.0986	42	57.2358	87	116.1895	132	163.9747	177	184.7755
43	55.6328	88	111.1862	133	155.5166	178	174.1453	43	58.5831	88	117.4220	133	164.7884	178	184.8258
44	56.9131	89	112.3493	134	156.2770	179	174.1687	44	59.9341	89	118.6596	134	165.6046	179	184.8510
45	58.1809	90	113.4985	135	156.9960	180	174.1921	45	61.2721	90	119.8826	135	166.3766	180	184.8762

205 keV								210 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	1.4310	46	65.8814	91	127.7676	136	176.9965	1	1.5016	46	69.2204	91	134.6690	136	187.2202
2	2.8621	47	67.3005	92	129.0581	137	177.8048	2	3.0034	47	70.7151	92	136.0405	137	188.0872
3	4.3098	48	68.7240	93	130.3329	138	178.5902	3	4.5227	48	72.2148	93	137.3957	138	188.9299
4	5.7415	49	70.1342	94	131.6134	139	179.3779	4	6.0250	49	73.7006	94	138.7500	139	189.7751
5	7.1735	50	71.5668	95	132.8779	140	180.1425	5	7.5278	50	75.2103	95	140.1019	140	190.5957
6	8.6061	51	72.9862	96	134.1480	141	180.9093	6	9.0312	51	76.7063	96	141.4529	141	191.4188
7	10.0393	52	74.4103	97	135.4237	142	181.6527	7	10.5353	52	78.2076	97	142.8101	142	192.2168
8	11.4733	53	75.8210	98	136.6615	143	182.3724	8	12.0402	53	79.6950	98	144.1274	143	192.9896
9	12.9246	54	77.2366	99	137.9047	144	183.0683	9	13.5634	54	81.1878	99	145.4507	144	193.7369
10	14.3603	55	78.6389	100	139.1313	145	183.7661	10	15.0703	55	82.6667	100	146.7566	145	194.4863
11	15.7806	56	80.0644	101	140.3633	146	184.4398	11	16.5610	56	84.1704	101	148.0685	146	195.2100
12	17.2185	57	81.4766	102	141.5785	147	185.0892	12	18.0703	57	85.6604	102	149.3629	147	195.9077
13	18.6577	58	82.8754	103	142.7989	148	185.7141	13	19.5810	58	87.1365	103	150.6631	148	196.5791
14	20.0817	59	84.2793	104	144.0022	149	186.3405	14	21.0758	59	88.6183	104	151.9454	149	197.2523
15	21.5238	60	85.6883	105	145.1884	150	186.9423	15	22.5896	60	90.1058	105	153.2096	150	197.8990
16	22.9674	61	87.0840	106	146.3795	151	187.5192	16	24.1051	61	91.5794	106	154.4795	151	198.5191
17	24.3961	62	88.4849	107	147.5532	152	188.0710	17	25.6051	62	93.0588	107	155.7310	152	199.1124
18	25.8265	63	89.8723	108	148.7318	153	188.6504	18	27.1070	63	94.5242	108	156.9881	153	199.7353
19	27.2588	64	91.2839	109	149.8926	154	189.1518	19	28.6110	64	96.0154	109	158.2264	154	200.2744
20	28.6931	65	92.6820	110	151.0354	155	189.6807	20	30.1171	65	97.4928	110	159.4458	155	200.8431
21	30.1294	66	94.0666	111	152.1829	156	190.1576	21	31.6255	66	98.9561	111	160.6705	156	201.3560
22	32.7741	67	95.4567	112	153.3122	157	190.6353	22	34.4031	67	100.4255	112	161.8760	157	201.8699
23	32.9920	68	96.8522	113	154.4229	158	191.0874	23	34.6320	68	101.9010	113	163.0620	158	202.3561
24	34.4352	69	98.2342	114	155.5382	159	191.5135	24	36.1479	69	103.3624	114	164.2530	159	202.8146
25	35.8640	70	99.6024	115	156.6580	160	191.9404	25	37.6489	70	104.8096	115	165.4491	160	203.2738
26	37.3123	71	100.9955	116	157.7354	161	192.3144	26	39.1705	71	106.2833	116	166.6003	161	203.6763
27	38.7295	72	102.3554	117	158.8172	162	192.6890	27	40.6595	72	107.7223	117	167.7563	162	204.0794
28	40.1663	73	103.7404	118	159.9033	163	193.0642	28	42.1693	73	109.1881	118	168.9172	163	204.4831
29	41.5890	74	105.1115	119	160.9462	164	193.3862	29	43.6644	74	110.6396	119	170.0322	164	204.8296

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

205 keV								210 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
30	43.0316	75	106.4884	120	161.9932	165	193.7085	30	45.1806	75	112.0974	120	171.1517	165	205.1766
31	44.4603	76	107.8315	121	163.0204	166	194.0044	31	46.6823	76	113.5197	121	172.2502	166	205.4951
32	45.8920	77	109.2000	122	164.0514	167	194.3006	32	48.1874	77	114.9694	122	173.3532	167	205.8139
33	47.3270	78	110.5544	123	165.0623	168	194.5432	33	49.6961	78	116.4043	123	174.4348	168	206.0751
34	48.7653	79	111.8945	124	166.0528	169	194.7861	34	51.2084	79	117.8244	124	175.4948	169	206.3365
35	50.1899	80	113.2604	125	167.0470	170	195.0021	35	52.7065	80	119.2722	125	176.5589	170	206.5691
36	51.6179	81	114.5918	126	168.0205	171	195.1913	36	54.2083	81	120.6837	126	177.6012	171	206.7728
37	53.0495	82	115.9289	127	168.9731	172	195.3806	37	55.7141	82	122.1015	127	178.6212	172	206.9766
38	54.4847	83	117.2717	128	169.9292	173	195.5159	38	57.2240	83	123.5258	128	179.6451	173	207.1223
39	55.9064	84	118.6204	129	170.8393	174	195.6513	39	58.7197	84	124.9565	129	180.6200	174	207.2681
40	57.3318	85	119.9133	130	171.7773	175	195.7596	40	60.2197	85	126.3284	130	181.6250	175	207.3848
41	58.7612	86	121.2323	131	172.6939	176	195.8409	41	61.7239	86	127.7284	131	182.6071	176	207.4723
42	60.1945	87	122.5571	132	173.5638	177	195.9223	42	63.2325	87	129.1347	132	183.5394	177	207.5599
43	61.6144	88	123.8669	133	174.4365	178	195.9765	43	64.7272	88	130.5255	133	184.4750	178	207.6183
44	63.0384	89	125.1824	134	175.3122	179	196.0036	44	66.2264	89	131.9226	134	185.4138	179	207.6475
45	64.4489	90	126.4827	135	176.1404	180	196.0307	45	67.7117	90	133.3038	135	186.3020	180	207.6767

215 keV								220 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	1.5740	46	72.6484	91	141.8003	136	197.8610	1	1.6480	46	76.1663	91	149.1669	136	208.9356
2	3.1481	47	74.2213	92	143.2567	137	198.7906	2	3.2963	47	77.8196	92	150.7123	137	209.9318
3	4.7406	48	75.7995	93	144.6961	138	199.6942	3	4.9637	48	79.4789	93	152.2399	138	210.9003
4	6.3154	49	77.3634	94	146.1424	139	200.6007	4	6.6126	49	81.1234	94	153.7754	139	211.8722
5	7.8907	50	78.9527	95	147.5714	140	201.4809	5	8.2621	50	82.7949	95	155.2928	140	212.8160
6	9.4666	51	80.5279	96	149.0074	141	202.3640	6	9.9123	51	84.4517	96	156.8180	141	213.7630
7	11.0433	52	82.1088	97	150.4503	142	203.2203	7	11.5633	52	86.1149	97	158.3509	142	214.6815
8	12.6209	53	83.6755	98	151.8511	143	204.0497	8	13.2153	53	87.7635	98	159.8394	143	215.5712
9	14.2177	54	85.2480	99	153.2585	144	204.8518	9	14.8874	54	89.4185	99	161.3354	144	216.4318
10	15.7974	55	86.8063	100	154.6479	145	205.6564	10	16.5418	55	91.0588	100	162.8124	145	217.2952
11	17.3603	56	88.3910	101	156.0439	146	206.4333	11	18.1785	56	92.7271	101	164.2969	146	218.1290
12	18.9427	57	89.9614	102	157.4215	147	207.1825	12	19.8358	57	94.3809	102	165.7622	147	218.9332
13	20.5266	58	91.5176	103	158.8057	148	207.9037	13	21.4948	58	96.0198	103	167.2348	148	219.7074
14	22.0940	59	93.0799	104	160.1712	149	208.6267	14	23.1365	59	97.6657	104	168.6879	149	220.4838
15	23.6814	60	94.6486	105	161.5178	150	209.3215	15	24.7992	60	99.3185	105	170.1211	150	221.2299
16	25.2707	61	96.2030	106	162.8706	151	209.9877	16	26.4640	61	100.9562	106	171.5614	151	221.9454
17	26.8437	62	97.7638	107	164.2042	152	210.6252	17	28.1119	62	102.6017	107	172.9815	152	222.6302
18	28.4189	63	99.3102	108	165.5440	153	211.2946	18	29.7621	63	104.2320	108	174.4086	153	223.3493
19	29.9963	64	100.8841	109	166.8641	154	211.8741	19	31.4148	64	105.8916	109	175.8151	154	223.9719
20	31.5761	65	102.4436	110	168.1644	155	212.4854	20	33.0702	65	107.5364	110	177.2007	155	224.6288
21	33.1584	66	103.9887	111	169.4706	156	213.0368	21	34.7282	66	109.1663	111	178.5929	156	225.2213
22	36.0724	67	105.5404	112	170.7566	157	213.5892	22	37.7821	67	110.8035	112	179.9639	157	225.8151
23	36.3126	68	107.0990	113	172.0220	158	214.1121	23	38.0339	68	112.4483	113	181.3133	158	226.3771
24	37.9032	69	108.6429	114	173.2931	159	214.6051	24	39.7010	69	114.0780	114	182.6691	159	226.9070
25	39.4783	70	110.1721	115	174.5700	160	215.0989	25	41.3521	70	115.6926	115	184.0314	160	227.4380
26	41.0750	71	111.7298	116	175.7991	161	215.5318	26	43.0260	71	117.3375	116	185.3430	161	227.9034
27	42.6378	72	113.2511	117	177.0337	162	215.9654	27	44.6645	72	118.9443	117	186.6607	162	228.3696
28	44.2225	73	114.8010	118	178.2737	163	216.3997	28	46.3261	73	120.5817	118	187.9845	163	228.8367
29	45.7920	74	116.3361	119	179.4649	164	216.7725	29	47.9720	74	122.2038	119	189.2565	164	229.2376
30	47.3838	75	117.8782	120	180.6613	165	217.1458	30	49.6414	75	123.8338	120	190.5343	165	229.6391
31	48.9605	76	119.3832	121	181.8355	166	217.4885	31	51.2951	76	125.4248	121	191.7886	166	230.0076
32	50.5410	77	120.9173	122	183.0146	167	217.8315	32	52.9531	77	127.0470	122	193.0485	167	230.3767
33	52.1254	78	122.4362	123	184.1712	168	218.1126	33	54.6153	78	128.6535	123	194.2846	168	230.6790
34	53.7139	79	123.9398	124	185.3049	169	218.3939	34	56.2819	79	130.2441	124	195.4965	169	230.9816
35	55.2875	80	125.4730	125	186.4433	170	218.6442	35	57.9333	80	131.8665	125	196.7136	170	231.2509
36	56.8653	81	126.9681	126	187.5584	171	218.8634	36	59.5892	81	133.4489	126	197.9061	171	231.4868
37	58.4475	82	128.4703	127	188.6500	172	219.0828	37	61.2499	82	135.0391	127	199.0737	172	231.7228
38	60.0341	83	129.9796	128	189.7459	173	219.2396	38	62.9155	83	136.6372	128	200.2462	173	231.8916
39	61.6061	84	131.4961	129	190.7897	174	219.3965	39	64.5660	84	138.2434	129	201.3631	174	232.0604
40	63.1820	85	132.9506	130	191.8658	175	219.5221	40	66.2215	85	139.7842	130	202.5149	175	232.1956
41	64.7641	86	134.4352	131	192.9177	176	219.6163	41	67.8823	86	141.3573	131	203.6408	176	232.2970
42	66.3503	87	135.9268	132	193.9164	177	219.7106	42	69.5484	87	142.9382	132	204.7102	177	232.3984
43	67.9221	88	137.4023	133	194.9187	178	219.7735	43	71.1996	88	144.5023	133	205.7836	178	232.4660

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

215 keV								220 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
44	69.4989	89	138.8849	134	195.9248	179	219.8049	44	72.8560	89	146.0744	134	206.8611	179	232.4999
45	71.0613	90	140.3510	135	196.8767	180	219.8363	45	74.4982	90	147.6293	135	207.8809	180	232.5337

225 keV								230 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	1.7239	46	79.7745	91	156.7745	136	220.4617	1	1.8013	46	83.4739	91	164.6291	136	232.4582
2	3.4479	47	81.5108	92	158.4131	137	221.5289	2	3.6028	47	85.2957	92	166.3655	137	233.6011
3	5.1920	48	83.2537	93	160.0334	138	222.5666	3	5.4253	48	87.1247	93	168.0829	138	234.7126
4	6.9168	49	84.9813	94	161.6623	139	223.6081	4	7.2277	49	88.9380	94	169.8099	139	235.8284
5	8.6421	50	86.7376	95	163.2726	140	224.6197	5	9.0306	50	90.7817	95	171.5175	140	236.9123
6	10.3683	51	88.4788	96	164.8914	141	225.6349	6	10.8345	51	92.6100	96	173.2347	141	238.0003
7	12.0953	52	90.2270	97	166.5189	142	226.6197	7	12.6393	52	94.4459	97	174.9615	142	239.0559
8	13.8234	53	91.9601	98	168.0995	143	227.5739	8	14.4453	53	96.2663	98	176.6390	143	240.0788
9	15.5727	54	93.7003	99	169.6885	144	228.4970	9	16.2733	54	98.0945	99	178.3258	144	241.0686
10	17.3034	55	95.4254	100	171.2578	145	229.4231	10	18.0822	55	99.9072	100	179.9921	145	242.0618
11	19.0157	56	97.1803	101	172.8354	146	230.3177	11	19.8719	56	101.7515	101	181.6676	146	243.0214
12	20.7497	57	98.9201	102	174.3930	147	231.1807	12	21.6842	57	103.5804	102	183.3223	147	243.9472
13	22.4854	58	100.6448	103	175.9587	148	232.0116	13	23.4985	58	105.3937	103	184.9861	148	244.8387
14	24.2032	59	102.3770	104	177.5040	149	232.8449	14	25.2941	59	107.2153	104	186.6286	149	245.7329
15	25.9430	60	104.1169	105	179.0286	150	233.6459	15	27.1129	60	109.0453	105	188.2494	150	246.5925
16	27.6852	61	105.8416	106	180.5611	151	234.4141	16	28.9342	61	110.8598	106	189.8791	151	247.4171
17	29.4098	62	107.5741	107	182.0724	152	235.1494	17	30.7373	62	112.6828	107	191.4867	152	248.2065
18	31.1369	63	109.2913	108	183.5915	153	235.9217	18	32.5431	63	114.4901	108	193.1029	153	249.0357
19	32.8667	64	111.0398	109	185.0891	154	236.5904	19	34.3519	64	116.3307	109	194.6967	154	249.7538
20	34.5994	65	112.7730	110	186.5648	155	237.2960	20	36.1638	65	118.1557	110	196.2675	155	250.5116
21	36.3351	66	114.4909	111	188.0480	156	237.9326	21	37.9790	66	119.9649	111	197.8467	156	251.1954
22	39.5324	67	116.2170	112	189.5088	157	238.5706	22	41.3231	67	121.7830	112	199.4025	157	251.8807
23	39.7959	68	117.9513	113	190.9470	158	239.1745	23	41.5988	68	123.6103	113	200.9345	158	252.5295
24	41.5416	69	119.6701	114	192.3923	159	239.7440	24	43.4249	69	125.4217	114	202.4745	159	253.1414
25	43.2705	70	121.3733	115	193.8449	160	240.3147	25	45.2337	70	127.2170	115	204.0226	160	253.7547
26	45.0236	71	123.1089	116	195.2437	161	240.8150	26	47.0679	71	129.0469	116	205.5138	161	254.2923
27	46.7397	72	124.8047	117	196.6494	162	241.3162	27	48.8636	72	130.8352	117	207.0126	162	254.8310
28	48.4803	73	126.5332	118	198.0619	163	241.8183	28	50.6850	73	132.6584	118	208.5192	163	255.3707
29	50.2045	74	128.2459	119	199.4196	164	242.2493	29	52.4896	74	134.4654	119	209.9674	164	255.8340
30	51.9535	75	129.9673	120	200.7836	165	242.6811	30	54.3203	75	136.2820	120	211.4229	165	256.2981
31	53.6864	76	131.6479	121	202.1229	166	243.0774	31	56.1344	76	138.0559	121	212.8523	166	256.7242
32	55.4238	77	133.3619	122	203.4685	167	243.4742	32	57.9534	77	139.8655	122	214.2888	167	257.1509
33	57.1659	78	135.0597	123	204.7889	168	243.7994	33	59.7775	78	141.6585	123	215.6986	168	257.5005
34	58.9129	79	136.7411	124	206.0837	169	244.1249	34	61.6070	79	143.4345	124	217.0815	169	257.8506
35	60.6441	80	138.4564	125	207.3844	170	244.4145	35	63.4202	80	145.2468	125	218.4710	170	258.1621
36	62.3803	81	140.1299	126	208.6591	171	244.6682	36	65.2388	81	147.0154	126	219.8330	171	258.4349
37	64.1217	82	141.8120	127	209.9075	172	244.9221	37	67.0632	82	148.7935	127	221.1671	172	258.7080
38	65.8685	83	143.5030	128	211.1613	173	245.1037	38	68.8935	83	150.5813	128	222.5074	173	258.9032
39	67.5997	84	145.2028	129	212.3559	174	245.2853	39	70.7077	84	152.3791	129	223.7847	174	259.0986
40	69.3365	85	146.8339	130	213.5880	175	245.4307	40	72.5280	85	154.1045	130	225.1023	175	259.2549
41	71.0790	86	148.4995	131	214.7929	176	245.5398	41	74.3545	86	155.8668	131	226.3910	176	259.3723
42	72.8273	87	150.1738	132	215.9373	177	245.6489	42	76.1875	87	157.6389	132	227.6154	177	259.4897
43	74.5603	88	151.8308	133	217.0863	178	245.7217	43	78.0047	88	159.3929	133	228.8449	178	259.5679
44	76.2994	89	153.4965	134	218.2400	179	245.7581	44	79.8284	89	161.1567	134	230.0797	179	259.6071
45	78.0230	90	155.1445	135	219.3321	180	245.7945	45	81.6364	90	162.9022	135	231.2488	180	259.6462

235 keV								240 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	1.8805	46	87.2650	91	172.7369	136	244.9453	1	1.9614	46	91.1487	91	181.1044	136	257.9446
2	3.7612	47	89.1749	92	174.5758	137	246.1690	2	3.9229	47	93.1493	92	183.0509	137	259.2543
3	5.6638	48	91.0927	93	176.3951	138	247.3592	3	5.9074	48	95.1586	93	184.9770	138	260.5286
4	7.5454	49	92.9944	94	178.2250	139	248.5542	4	7.8700	49	97.1513	94	186.9149	139	261.8082
5	9.4277	50	94.9283	95	180.0348	140	249.7153	5	9.8333	50	99.1782	95	188.8320	140	263.0518
6	11.3109	51	96.8463	96	181.8552	141	250.8810	6	11.7976	51	101.1888	96	190.7609	141	264.3005
7	13.1952	52	98.7728	97	183.6863	142	252.0123	7	13.7632	52	103.2086	97	192.7016	142	265.5125
8	15.0808	53	100.6833	98	185.4657	143	253.1086	8	15.7300	53	105.2121	98	194.5879	143	266.6874

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

235 keV								240 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
9	16.9895	54	102.6024	99	187.2553	144	254.1697	9	17.7212	54	107.2251	99	196.4857	144	267.8246
10	18.8782	55	104.5055	100	189.0237	145	255.2345	10	19.6914	55	109.2216	100	198.3614	145	268.9661
11	20.7469	56	106.4422	101	190.8023	146	256.2636	11	21.6410	56	111.2538	101	200.2484	146	270.0695
12	22.6394	57	108.3632	102	192.5592	147	257.2565	12	23.6154	57	113.2699	102	202.1130	147	271.1342
13	24.5341	58	110.2681	103	194.3262	148	258.2128	13	25.5922	58	115.2696	103	203.9888	148	272.1599
14	26.4093	59	112.1822	104	196.0711	149	259.1722	14	27.5488	59	117.2793	104	205.8416	149	273.1891
15	28.3089	60	114.1055	105	197.7934	150	260.0946	15	29.5309	60	119.2991	105	207.6709	150	274.1787
16	30.2112	61	116.0128	106	199.5256	151	260.9796	16	31.5160	61	121.3026	106	209.5111	151	275.1284
17	32.0945	62	117.9296	107	201.2347	152	261.8268	17	33.4814	62	123.3164	107	211.3274	152	276.0376
18	33.9808	63	119.8302	108	202.9535	153	262.7170	18	35.4501	63	125.3137	108	213.1544	153	276.9931
19	35.8704	64	121.7663	109	204.6487	154	263.4880	19	37.4224	64	127.3488	109	214.9568	154	277.8207
20	37.7634	65	123.6864	110	206.3200	155	264.3017	20	39.3984	65	129.3674	110	216.7343	155	278.6944
21	39.6600	66	125.5903	111	208.0007	156	265.0360	21	41.3782	66	131.3695	111	218.5221	156	279.4828
22	43.1545	67	127.5040	112	209.6568	157	265.7721	22	45.0266	67	133.3824	112	220.2844	157	280.2734
23	43.4426	68	129.4278	113	211.2881	158	266.4690	23	45.3274	68	135.4064	113	222.0206	158	281.0218
24	45.3511	69	131.3353	114	212.9282	159	267.1264	24	47.3202	69	137.4137	114	223.7668	159	281.7280
25	47.2416	70	133.2263	115	214.5774	160	267.7852	25	49.2945	70	139.4040	115	225.5229	160	282.4358
26	49.1589	71	135.1542	116	216.1664	161	268.3630	26	51.2969	71	141.4337	116	227.2155	161	283.0565
27	51.0362	72	137.0386	117	217.7639	162	268.9418	27	53.2577	72	143.4182	117	228.9175	162	283.6785
28	52.9406	73	138.9604	118	219.3700	163	269.5218	28	55.2471	73	145.4424	118	230.6292	163	284.3017
29	54.8275	74	140.8655	119	220.9144	164	270.0198	29	57.2185	74	147.4495	119	232.2754	164	284.8370
30	56.7420	75	142.7811	120	222.4668	165	270.5187	30	59.2189	75	149.4683	120	233.9307	165	285.3732
31	58.6393	76	144.6523	121	223.9918	166	270.9767	31	61.2015	76	151.4407	121	235.5570	166	285.8655
32	60.5421	77	146.5615	122	225.5246	167	271.4355	32	63.1901	77	153.4537	122	237.1922	167	286.3587
33	62.4504	78	148.4536	123	227.0295	168	271.8113	33	65.1848	78	155.4491	123	238.7979	168	286.7627
34	64.3646	79	150.3283	124	228.5059	169	272.1877	34	67.1859	79	157.4267	124	240.3736	169	287.1673
35	66.2619	80	152.2418	125	229.9897	170	272.5226	35	69.1695	80	159.4457	125	241.9576	170	287.5275
36	68.1652	81	154.1095	126	231.4444	171	272.8160	36	71.1598	81	161.4169	126	243.5110	171	287.8429
37	70.0748	82	155.9879	127	232.8697	172	273.1097	37	73.1569	82	163.3999	127	245.0333	172	288.1587
38	71.9909	83	157.8769	128	234.3019	173	273.3196	38	75.1611	83	165.3946	128	246.5632	173	288.3844
39	73.8904	84	159.7769	129	235.6671	174	273.5297	39	77.1482	84	167.4015	129	248.0219	174	288.6104
40	75.7965	85	161.6009	130	237.0757	175	273.6979	40	79.1425	85	169.3285	130	249.5274	175	288.7912
41	77.7095	86	163.4644	131	238.4537	176	273.8241	41	81.1444	86	171.2978	131	251.0006	176	288.9270
42	79.6295	87	165.3387	132	239.7632	177	273.9503	42	83.1539	87	173.2791	132	252.4007	177	289.0627
43	81.5333	88	167.1944	133	241.0785	178	274.0345	43	85.1468	88	175.2412	133	253.8074	178	289.1533
44	83.4443	89	169.0609	134	242.3997	179	274.0766	44	87.1475	89	177.2152	134	255.2206	179	289.1986
45	85.3390	90	170.9085	135	243.6508	180	274.1187	45	89.1315	90	179.1698	135	256.5592	180	289.2439

245 keV								250 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	2.0439	46	95.1257	91	189.7386	136	271.4789	1	2.1282	46	99.1967	91	198.6466	136	285.5729
2	4.0881	47	97.2197	92	191.7977	137	272.8806	2	4.2567	47	101.3869	92	200.8239	137	287.0728
3	6.1562	48	99.3231	93	193.8360	138	274.2446	3	6.4101	48	103.5873	93	202.9797	138	288.5326
4	8.2014	49	101.4097	94	195.8871	139	275.6146	4	8.5397	49	105.7705	94	205.1498	139	289.9992
5	10.2475	50	103.5324	95	197.9169	140	276.9462	5	10.6702	50	107.9920	95	207.2979	140	291.4251
6	12.2946	51	105.6385	96	199.9597	141	278.2837	6	12.8019	51	110.1965	96	209.4603	141	292.8574
7	14.3431	52	107.7546	97	202.0156	142	279.5821	7	14.9350	52	112.4119	97	211.6372	142	294.2482
8	16.3930	53	109.8541	98	204.0144	143	280.8409	8	17.0698	53	114.6103	98	213.7543	143	295.5969
9	18.4683	54	111.9638	99	206.0259	144	282.0596	9	19.2309	54	116.8200	99	215.8854	144	296.9029
10	20.5219	55	114.0568	100	208.0146	145	283.2832	10	21.3696	55	119.0126	100	217.9930	145	298.2143
11	22.5540	56	116.1877	101	210.0158	146	284.4661	11	23.4860	56	121.2453	101	220.1144	146	299.4824
12	24.6121	57	118.3021	102	211.9937	147	285.6078	12	25.6296	57	123.4612	102	222.2117	147	300.7064
13	26.6728	58	120.3997	103	213.9841	148	286.7078	13	27.7760	58	125.6600	103	224.3229	148	301.8860
14	28.7126	59	122.5082	104	215.9506	149	287.8117	14	29.9007	59	127.8708	104	226.4093	149	303.0701
15	30.7791	60	124.6279	105	217.8928	150	288.8733	15	32.0534	60	130.0938	105	228.4704	150	304.2089
16	32.8488	61	126.7309	106	219.8470	151	289.8922	16	34.2095	61	132.2997	106	230.5449	151	305.3021
17	34.8981	62	128.8452	107	221.7763	152	290.8679	17	36.3446	62	134.5180	107	232.5936	152	306.3492
18	36.9511	63	130.9427	108	223.7175	153	291.8935	18	38.4836	63	136.7191	108	234.6555	153	307.4498
19	39.0078	64	133.0802	109	225.6332	154	292.7819	19	40.6268	64	138.9628	109	236.6908	154	308.4034
20	41.0686	65	135.2010	110	227.5229	155	293.7198	20	42.7743	65	141.1895	110	238.6990	155	309.4104
21	43.1337	66	137.3049	111	229.4240	156	294.5664	21	44.9264	66	143.3990	111	240.7201	156	310.3194
22	46.9395	67	139.4207	112	231.2985	157	295.4153	22	48.8932	67	145.6215	112	242.7133	157	311.2310

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

245 keV								250 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
23	47.2533	68	141.5486	113	233.1458	158	296.2192	23	49.2204	68	147.8572	113	244.6781	158	312.0943
24	49.3324	69	143.6595	114	235.0041	159	296.9777	24	51.3878	69	150.0756	114	246.6551	159	312.9091
25	51.3924	70	145.7530	115	236.8736	160	297.7380	25	53.5355	70	152.2764	115	248.6447	160	313.7259
26	53.4820	71	147.8885	116	238.6759	161	298.4049	26	55.7142	71	154.5218	116	250.5632	161	314.4424
27	55.5284	72	149.9769	117	240.4887	162	299.0732	27	57.8482	72	156.7182	117	252.4934	162	315.1604
28	57.6048	73	152.1076	118	242.3122	163	299.7429	28	60.0137	73	158.9597	118	254.4356	163	315.8801
29	59.6626	74	154.2210	119	244.0665	164	300.3181	29	62.1601	74	161.1835	119	256.3046	164	316.4983
30	61.7510	75	156.3471	120	245.8308	165	300.8944	30	64.3387	75	163.4213	120	258.1847	165	317.1177
31	63.8211	76	158.4248	121	247.5649	166	301.4236	31	66.4984	76	165.6088	121	260.0330	166	317.6866
32	65.8977	77	160.5459	122	249.3087	167	301.9537	32	68.6652	77	167.8424	122	261.8923	167	318.2564
33	67.9810	78	162.6491	123	251.0215	168	302.3881	33	70.8392	78	170.0578	123	263.7190	168	318.7234
34	70.0711	79	164.7339	124	252.7028	169	302.8231	34	73.0207	79	172.2545	124	265.5125	169	319.1911
35	72.1434	80	166.8630	125	254.3933	170	303.2103	35	75.1839	80	174.4983	125	267.3162	170	319.6074
36	74.2229	81	168.9422	126	256.0515	171	303.5495	36	77.3549	81	176.6903	126	269.0861	171	319.9722
37	76.3099	82	171.0343	127	257.6770	172	303.8890	37	79.5340	82	178.8964	127	270.8213	172	320.3373
38	78.4044	83	173.1395	128	259.3110	173	304.1318	38	81.7214	83	181.1168	128	272.5661	173	320.5984
39	80.4815	84	175.2580	129	260.8693	174	304.3748	39	83.8909	84	183.3519	129	274.2305	174	320.8596
40	82.5665	85	177.2928	130	262.4780	175	304.5693	40	86.0690	85	185.4993	130	275.9491	175	321.0688
41	84.6597	86	179.3727	131	264.0524	176	304.7152	41	88.2560	86	187.6950	131	277.6315	176	321.2258
42	86.7613	87	181.4658	132	265.5492	177	304.8612	42	90.4522	87	189.9051	132	279.2313	177	321.3829
43	88.8457	88	183.5393	133	267.0533	178	304.9586	43	92.6308	88	192.0951	133	280.8393	178	321.4876
44	90.9388	89	185.6259	134	268.5647	179	305.0073	44	94.8187	89	194.2997	134	282.4556	179	321.5400
45	93.0147	90	187.6925	135	269.9966	180	305.0560	45	96.9892	90	196.4837	135	283.9871	180	321.5924

255 keV								260 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	2.2142	46	103.3626	91	207.8359	136	300.2528	1	2.3019	46	107.6242	91	217.3144	136	315.5467
2	4.4287	47	105.6518	92	210.1371	137	301.8576	2	4.6040	47	110.0152	92	219.7456	137	317.2637
3	6.6691	48	107.9520	93	212.4163	138	303.4199	3	6.9332	48	112.4182	93	222.1542	138	318.9357
4	8.8848	49	110.2347	94	214.7112	139	304.9899	4	9.2367	49	114.8033	94	224.5802	139	320.6162
5	11.1015	50	112.5579	95	216.9835	140	306.5165	5	11.5413	50	117.2313	95	226.9830	140	322.2507
6	13.3195	51	114.8638	96	219.2716	141	308.0504	6	13.8473	51	119.6417	96	229.4032	141	323.8934
7	15.5390	52	117.1816	97	221.5758	142	309.5401	7	16.1549	52	122.0650	97	231.8411	142	325.4891
8	17.7602	53	119.4821	98	223.8173	143	310.9850	8	18.4644	53	124.4708	98	234.2134	143	327.0371
9	20.0090	54	121.7949	99	226.0743	144	312.3845	9	20.8027	54	126.8898	99	236.6028	144	328.5368
10	22.2346	55	124.0902	100	228.3069	145	313.7900	10	23.1168	55	129.2912	100	238.9672	145	330.0432
11	24.4370	56	126.4281	101	230.5550	146	315.1493	11	25.4071	56	131.7377	101	241.3486	146	331.5005
12	26.6679	57	128.7489	102	232.7781	147	316.4618	12	27.7269	57	134.1668	102	243.7043	147	332.9077
13	28.9017	58	131.0523	103	235.0165	148	317.7268	13	30.0501	58	136.5782	103	246.0769	148	334.2643
14	31.1132	59	133.3687	104	237.2293	149	318.9967	14	32.3500	59	139.0039	104	248.4230	149	335.6265
15	33.3538	60	135.6985	105	239.4159	150	320.2184	15	34.6805	60	141.4440	105	250.7421	150	336.9372
16	35.5983	61	138.0109	106	241.6175	151	321.3914	16	37.0151	61	143.8666	106	253.0777	151	338.1958
17	37.8210	62	140.3368	107	243.7921	152	322.5150	17	39.3272	62	146.3039	107	255.3854	152	339.4016
18	40.0479	63	142.6453	108	245.9815	153	323.6963	18	41.6439	63	148.7235	108	257.7095	153	340.6696
19	42.2793	64	144.9990	109	248.1433	154	324.7199	19	43.9655	64	151.1911	109	260.0050	154	341.7686
20	44.5154	65	147.3354	110	250.2768	155	325.8010	20	46.2921	65	153.6412	110	262.2712	155	342.9293
21	46.7566	66	149.6543	111	252.4246	156	326.7771	21	48.6242	66	156.0735	111	264.5531	156	343.9775
22	50.8880	67	151.9874	112	254.5435	157	327.7560	22	52.9238	67	158.5214	112	266.8050	157	345.0289
23	51.2288	68	154.3351	113	256.6327	158	328.6834	23	53.2785	68	160.9851	113	269.0260	158	346.0251
24	53.4864	69	156.6651	114	258.7356	159	329.5585	24	55.6285	69	163.4310	114	271.2622	159	346.9653
25	55.7238	70	158.9772	115	260.8524	160	330.4361	25	57.9576	70	165.8586	115	273.5137	160	347.9082
26	57.9938	71	161.3367	116	262.8941	161	331.2059	26	60.3209	71	168.3368	116	275.6862	161	348.7354
27	60.2174	72	163.6454	117	264.9489	162	331.9775	27	62.6361	72	170.7621	117	277.8731	162	349.5647
28	62.4741	73	166.0021	118	267.0169	163	332.7510	28	64.9862	73	173.2386	118	280.0748	163	350.3961
29	64.7112	74	168.3408	119	269.0076	164	333.4154	29	67.3160	74	175.6968	119	282.1947	164	351.1103
30	66.9820	75	170.6948	120	271.0107	165	334.0812	30	69.6813	75	178.1718	120	284.3284	165	351.8261
31	69.2336	76	172.9966	121	272.9804	166	334.6927	31	72.0269	76	180.5925	121	286.4272	166	352.4835
32	71.4927	77	175.3475	122	274.9624	167	335.3054	32	74.3806	77	183.0656	122	288.5396	167	353.1423
33	73.7598	78	177.6798	123	276.9101	168	335.8075	33	76.7429	78	185.5197	123	290.6161	168	353.6823
34	76.0349	79	179.9931	124	278.8229	169	336.3104	34	79.1141	79	187.9545	124	292.6559	169	354.2231
35	78.2913	80	182.3566	125	280.7473	170	336.7581	35	81.4660	80	190.4430	125	294.7086	170	354.7046
36	80.5562	81	184.6662	126	282.6358	171	337.1503	36	83.8271	81	192.8752	126	296.7236	171	355.1264

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

255 keV								260 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
37	82.8298	82	186.9912	127	284.4880	172	337.5430	37	86.1977	82	195.3245	127	298.7003	172	355.5488
38	85.1125	83	189.3321	128	286.3509	173	337.8238	38	88.5781	83	197.7912	128	300.6891	173	355.8508
39	87.3768	84	191.6891	129	288.1283	174	338.1048	39	90.9398	84	200.2755	129	302.5870	174	356.1531
40	89.6506	85	193.9542	130	289.9641	175	338.3298	40	93.3116	85	202.6637	130	304.5478	175	356.3952
41	91.9339	86	196.2709	131	291.7617	176	338.4986	41	95.6939	86	205.1069	131	306.4683	176	356.5768
42	94.2272	87	198.6035	132	293.4714	177	338.6676	42	98.0870	87	207.5677	132	308.2954	177	356.7586
43	96.5025	88	200.9155	133	295.1903	178	338.7802	43	100.4617	88	210.0074	133	310.1328	178	356.8798
44	98.7881	89	203.2435	134	296.9185	179	338.8366	44	102.8476	89	212.4648	134	311.9805	179	356.9404
45	101.0588	90	205.5505	135	298.5564	180	338.8929	45	105.2153	90	214.9006	135	313.7321	180	357.0010

265 keV								270 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	2.3913	46	111.9823	91	227.0903	136	331.4848	1	2.4824	46	116.4378	91	237.1723	136	348.0993
2	4.7828	47	114.4780	92	229.6579	137	333.3219	2	4.9650	47	119.0412	92	239.8829	137	350.0651
3	7.2025	48	116.9868	93	232.2023	138	335.1113	3	7.4769	48	121.6588	93	242.5700	138	351.9802
4	9.5955	49	119.4774	94	234.7659	139	336.9102	4	9.9612	49	124.2579	94	245.2781	139	353.9061
5	11.9897	50	122.0132	95	237.3058	140	338.6603	5	12.4467	50	126.9048	95	247.9620	140	355.7801
6	14.3854	51	124.5312	96	239.8648	141	340.4195	6	14.9338	51	129.5337	96	250.6670	141	357.6643
7	16.7828	52	127.0633	97	242.4434	142	342.1288	7	17.4228	52	132.1778	97	253.3935	142	359.4955
8	19.1823	53	129.5776	98	244.9534	143	343.7874	8	19.9140	53	134.8039	98	256.0484	143	361.2728
9	21.6118	54	132.1063	99	247.4822	144	345.3945	9	22.4364	54	137.4457	99	258.7240	144	362.9953
10	24.0163	55	134.6171	100	249.9853	145	347.0093	10	24.9331	55	140.0694	100	261.3732	145	364.7264
11	26.3961	56	137.1756	101	252.5072	146	348.5716	11	27.4041	56	142.7435	101	264.0431	146	366.4016
12	28.8068	57	139.7165	102	255.0026	147	350.0807	12	29.9074	57	145.3999	102	266.6858	147	368.0200
13	31.2210	58	142.2396	103	257.5166	148	351.5357	13	32.4145	58	148.0382	103	269.3491	148	369.5809
14	33.6112	59	144.7781	104	260.0035	149	352.9970	14	34.8969	59	150.6934	104	271.9845	149	371.1487
15	36.0334	60	147.3324	105	262.4624	150	354.4033	15	37.4125	60	153.3656	105	274.5911	150	372.6579
16	38.4600	61	149.8689	106	264.9396	151	355.7540	16	39.9330	61	156.0200	106	277.2178	151	374.1076
17	40.8634	62	152.4214	107	267.3879	152	357.0482	17	42.4295	62	158.6917	107	279.8148	152	375.4970
18	43.2717	63	154.9561	108	269.8544	153	358.4094	18	44.9313	63	161.3454	108	282.4318	153	376.9586
19	45.6853	64	157.5416	109	272.2912	154	359.5894	19	47.4388	64	164.0531	109	285.0182	154	378.2258
20	48.1044	65	160.1095	110	274.6977	155	360.8359	20	49.9523	65	166.7430	110	287.5731	155	379.5646
21	50.5294	66	162.6594	111	277.1217	156	361.9617	21	52.4721	66	169.4147	111	290.1475	156	380.7740
22	55.0008	67	165.2262	112	279.5144	157	363.0912	22	57.1191	67	172.1049	112	292.6894	157	381.9876
23	55.3697	68	167.8104	113	281.8750	158	364.1614	23	57.5025	68	174.8140	113	295.1981	158	383.1376
24	57.8140	69	170.3765	114	284.2525	159	365.1717	24	60.0432	69	177.5049	114	297.7254	159	384.2234
25	60.2369	70	172.9241	115	286.6471	160	366.1849	25	62.5618	70	180.1771	115	300.2717	160	385.3126
26	62.6956	71	175.5255	116	288.9581	161	367.0740	26	65.1180	71	182.9064	116	302.7299	161	386.2684
27	65.1046	72	178.0721	117	291.2853	162	367.9655	27	67.6228	72	185.5790	117	305.2061	162	387.2268
28	67.5500	73	180.6731	118	293.6289	163	368.8592	28	70.1659	73	188.3095	118	307.7004	163	388.1879
29	69.9748	74	183.2556	119	295.8861	164	369.6271	29	72.6877	74	191.0213	119	310.1035	164	389.0137
30	72.4368	75	185.8564	120	298.1587	165	370.3968	30	75.2486	75	193.7532	120	312.5238	165	389.8415
31	74.8785	76	188.4009	121	300.3947	166	371.1038	31	77.7888	76	196.4266	121	314.9058	166	390.6020
32	77.3292	77	191.0013	122	302.6458	167	371.8123	32	80.3386	77	199.1594	122	317.3046	167	391.3642
33	79.7890	78	193.5824	123	304.8594	168	372.3930	33	82.8984	78	201.8729	123	319.6640	168	391.9890
34	82.2585	79	196.1439	124	307.0344	169	372.9748	34	85.4685	79	204.5666	124	321.9832	169	392.6149
35	84.7082	80	198.7626	125	309.2238	170	373.4927	35	88.0185	80	207.3211	125	324.3182	170	393.1722
36	87.1680	81	201.3229	126	311.3736	171	373.9466	36	90.5793	81	210.0151	126	326.6118	171	393.6606
37	89.6380	82	203.9019	127	313.4832	172	374.4010	37	93.1512	82	212.7295	127	328.8629	172	394.1496
38	92.1186	83	206.4999	128	315.6061	173	374.7259	38	95.7346	83	215.4647	128	331.1290	173	394.4994
39	94.5802	84	209.1174	129	317.6326	174	375.0512	39	98.2986	84	218.2212	129	333.2929	174	394.8494
40	97.0527	85	211.6342	130	319.7268	175	375.3117	40	100.8744	85	220.8727	130	335.5296	175	395.1297
41	99.5366	86	214.2098	131	321.7786	176	375.5071	41	103.4625	86	223.5867	131	337.7216	176	395.3401
42	102.0321	87	216.8047	132	323.7311	177	375.7027	42	106.0633	87	226.3220	132	339.8081	177	395.5506
43	104.5090	88	219.3782	133	325.6950	178	375.8331	43	108.6451	88	229.0355	133	341.9073	178	395.6910
44	106.9980	89	221.9710	134	327.6704	179	375.8984	44	111.2399	89	231.7703	134	344.0195	179	395.7613
45	109.4684	90	224.5419	135	329.5437	180	375.9636	45	113.8159	90	234.4827	135	346.0229	180	395.8315

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

275 keV								280 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	2.5752	46	120.9915	91	247.5695	136	365.4251	1	2.6696	46	125.6445	91	258.2913	136	383.4994
2	5.1506	47	123.7057	92	250.4302	137	367.5288	2	5.3397	47	128.4725	92	261.3096	137	385.7510
3	7.7564	48	126.4352	93	253.2670	138	369.5787	3	8.0411	48	131.3171	93	264.3036	138	387.9456
4	10.3336	49	129.1460	94	256.1269	139	371.6407	4	10.7130	49	134.1428	94	267.3231	139	390.1537
5	12.9122	50	131.9073	95	258.9622	140	373.6476	5	13.3863	50	137.0217	95	270.3175	140	392.3034
6	15.4925	51	134.6503	96	261.8207	141	375.6660	6	16.0614	51	139.8823	96	273.3374	141	394.4659
7	18.0748	52	137.4099	97	264.7029	142	377.6281	7	18.7387	52	142.7608	97	276.3834	142	396.5687
8	20.6594	53	140.1512	98	267.5102	143	379.5329	8	21.4186	53	145.6209	98	279.3512	143	398.6105
9	23.2766	54	142.9096	99	270.3403	144	381.3794	9	24.1323	54	148.4995	99	282.3442	144	400.5904
10	25.8671	55	145.6497	100	273.1435	145	383.2355	10	26.8185	55	151.3597	100	285.3095	145	402.5810
11	28.4312	56	148.4431	101	275.9694	146	385.0321	11	29.4774	56	154.2762	101	288.3001	146	404.5083
12	31.0289	57	151.2187	102	278.7675	147	386.7682	12	32.1712	57	157.1748	102	291.2621	147	406.3710
13	33.6307	58	153.9761	103	281.5884	148	388.4428	13	34.8695	58	160.0551	103	294.2492	148	408.1682
14	36.2069	59	156.7517	104	284.3805	149	390.1254	14	37.5415	59	162.9552	104	297.2069	149	409.9743
15	38.8179	60	159.5459	105	287.1430	150	391.7453	15	40.2496	60	165.8754	105	300.1342	150	411.7135
16	41.4341	61	162.3221	106	289.9278	151	393.3016	16	42.9634	61	168.7775	106	303.0860	151	413.3848
17	44.0256	62	165.1172	107	292.6819	152	394.7936	17	45.6517	62	171.7003	107	306.0064	152	414.9873
18	46.6229	63	167.8941	108	295.4582	153	396.3632	18	48.3463	63	174.6047	108	308.9512	153	416.6736
19	49.2262	64	170.7282	109	298.2029	154	397.7244	19	51.0474	64	177.5698	109	311.8635	154	418.1362
20	51.8360	65	173.5445	110	300.9151	155	399.1629	20	53.7554	65	180.5170	110	314.7423	155	419.6820
21	54.4526	66	176.3425	111	303.6488	156	400.4624	21	56.4708	66	183.4458	111	317.6448	156	421.0789
22	59.2787	67	179.1606	112	306.3489	157	401.7666	22	61.4798	67	186.3965	112	320.5126	157	422.4810
23	59.6770	68	181.9993	113	309.0145	158	403.0028	23	61.8932	68	189.3696	113	323.3448	158	423.8101
24	62.3160	69	184.8196	114	311.7008	159	404.1701	24	64.6327	69	192.3243	114	326.1998	159	425.0655
25	64.9325	70	187.6212	115	314.4081	160	405.3412	25	67.3491	70	195.2602	115	329.0781	160	426.3250
26	67.5883	71	190.4834	116	317.0226	161	406.3690	26	70.1067	71	198.2605	116	331.8587	161	427.4307
27	70.1911	72	193.2870	117	319.6570	162	407.3998	27	72.8095	72	201.2001	117	334.6614	162	428.5397
28	72.8339	73	196.1521	118	322.3116	163	408.4335	28	75.5543	73	204.2051	118	337.4864	163	429.6520
29	75.4550	74	198.9984	119	324.8700	164	409.3219	29	78.2768	74	207.1914	119	340.2099	164	430.6080
30	78.1171	75	201.8666	120	327.4473	165	410.2125	30	81.0423	75	210.2014	120	342.9545	165	431.5665
31	80.7579	76	204.6742	121	329.9847	166	411.0308	31	83.7862	76	213.1488	121	345.6574	166	432.4474
32	83.4092	77	207.5451	122	332.5408	167	411.8510	32	86.5413	77	216.1636	122	348.3810	167	433.3303
33	86.0712	78	210.3965	123	335.0557	168	412.5234	33	89.3079	78	219.1587	123	351.0617	168	434.0542
34	88.7444	79	213.2279	124	337.5284	169	413.1971	34	92.0866	79	222.1337	124	353.6981	169	434.7795
35	91.3971	80	216.1242	125	340.0187	170	413.7969	35	94.8444	80	225.1779	125	356.3543	170	435.4255
36	94.0614	81	218.9577	126	342.4656	171	414.3226	36	97.6148	81	228.1569	126	358.9649	171	435.9916
37	96.7378	82	221.8135	127	344.8680	172	414.8491	37	100.3982	82	231.1604	127	361.5287	172	436.5585
38	99.4266	83	224.6921	128	347.2870	173	415.2256	38	103.1949	83	234.1888	128	364.1111	173	436.9640
39	102.0955	84	227.5940	129	349.5976	174	415.6025	39	105.9715	84	237.2427	129	366.5785	174	437.3700
40	104.7773	85	230.3861	130	351.9866	175	415.9043	40	108.7619	85	240.1820	130	369.1304	175	437.6951
41	107.4724	86	233.2451	131	354.3285	176	416.1308	41	111.5667	86	243.1926	131	371.6327	176	437.9391
42	110.1811	87	236.1272	132	356.5583	177	416.3575	42	114.3863	87	246.2286	132	374.0159	177	438.1832
43	112.8706	88	238.9874	133	358.8023	178	416.5087	43	117.1863	88	249.2424	133	376.4150	178	438.3461
44	115.5742	89	241.8709	134	361.0608	179	416.5843	44	120.0016	89	252.2818	134	378.8303	179	438.4275
45	118.2587	90	244.7318	135	363.2036	180	416.6599	45	122.7976	90	255.2983	135	381.1224	180	438.5090

285 keV								290 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	2.7658	46	130.3975	91	269.3477	136	402.3625	1	2.8637	46	135.2516	91	280.7492	136	422.0576
2	5.5321	47	133.3425	92	272.5315	137	404.7728	2	5.7279	47	138.3169	92	284.1067	137	424.6385
3	8.3309	48	136.3055	93	275.6906	138	407.1229	3	8.6259	48	141.4016	93	287.4395	138	427.1556
4	11.0991	49	139.2495	94	278.8778	139	409.4879	4	11.4921	49	144.4671	94	290.8028	139	429.6894
5	13.8689	50	142.2495	95	282.0395	140	411.7911	5	14.3601	50	147.5918	95	294.1405	140	432.1577
6	16.6406	51	145.2310	96	285.2293	141	414.1086	6	17.2302	51	150.6979	96	297.5090	141	434.6420
7	19.4147	52	148.2320	97	288.4476	142	416.3626	7	20.1028	52	153.8250	97	300.9089	142	437.0590
8	22.1916	53	151.2145	98	291.5845	143	418.5520	8	22.9783	53	156.9336	98	304.2239	143	439.4071
9	25.0036	54	154.2170	99	294.7490	144	420.6753	9	25.8903	54	160.0637	99	307.5693	144	441.6851
10	27.7871	55	157.2010	100	297.8855	145	422.8108	10	28.7731	55	163.1753	100	310.8861	145	443.9767
11	30.5426	56	160.2445	101	301.0496	146	424.8788	11	31.6269	56	166.3499	101	314.2334	146	446.1965
12	33.3344	57	163.2700	102	304.1846	147	426.8780	12	34.5185	57	169.5065	102	317.5511	147	448.3429
13	36.1310	58	166.2773	103	307.3474	148	428.8073	13	37.4152	58	172.6448	103	320.8993	148	450.4148
14	38.9005	59	169.3059	104	310.4800	149	430.7466	14	40.2840	59	175.8062	104	324.2168	149	452.4979

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

285 keV								290 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
15	41.7077	60	172.3564	105	313.5814	150	432.6145	15	43.1921	60	178.9913	105	327.5024	150	454.5047
16	44.5209	61	175.3888	106	316.7100	151	434.4099	16	46.1066	61	182.1583	106	330.8179	151	456.4341
17	47.3080	62	178.4435	107	319.8062	152	436.1316	17	48.9943	62	185.3495	107	334.1004	152	458.2847
18	50.1017	63	181.4799	108	322.9295	153	437.9438	18	51.8892	63	188.5224	108	337.4127	153	460.2330
19	52.9025	64	184.5805	109	326.0193	154	439.5159	19	54.7916	64	191.7634	109	340.6906	154	461.9235
20	55.7108	65	187.6633	110	329.0746	155	441.1779	20	57.7020	65	194.9867	110	343.9331	155	463.7109
21	58.5269	66	190.7278	111	332.1562	156	442.6798	21	60.6208	66	198.1917	111	347.2046	156	465.3267
22	63.7225	67	193.8160	112	335.2019	157	444.1878	22	66.0068	67	201.4224	112	350.4392	157	466.9491
23	64.1513	68	196.9284	113	338.2108	158	445.6175	23	66.4514	68	204.6795	113	353.6358	158	468.4876
24	66.9934	69	200.0226	114	341.2450	159	446.9680	24	69.3981	69	207.9183	114	356.8604	159	469.9411
25	69.8118	70	203.0979	115	344.3051	160	448.3233	25	72.3207	70	211.1384	115	360.1136	160	471.4001
26	72.6733	71	206.2416	116	347.2622	161	449.5131	26	75.2882	71	214.4311	116	363.2585	161	472.6811
27	75.4783	72	209.3227	117	350.2438	162	450.7067	27	78.1976	72	217.6591	117	366.4305	162	473.9664
28	78.3272	73	212.4732	118	353.2502	163	451.9040	28	81.1529	73	220.9609	118	369.6300	163	475.2558
29	81.1534	74	215.6049	119	356.1495	164	452.9333	29	84.0850	74	224.2441	119	372.7167	164	476.3645
30	84.0247	75	218.7627	120	359.0722	165	453.9654	30	87.0643	75	227.5555	120	375.8293	165	477.4762
31	86.8738	76	221.8556	121	361.9515	166	454.9139	31	90.0212	76	230.8000	121	378.8966	166	478.4981
32	89.7351	77	225.0202	122	364.8539	167	455.8647	32	92.9909	77	234.1207	122	381.9896	167	479.5226
33	92.6088	78	228.1652	123	367.7113	168	456.6444	33	95.9741	78	237.4219	123	385.0358	168	480.3629
34	95.4955	79	231.2900	124	370.5225	169	457.4257	34	98.9713	79	240.7029	124	388.0337	169	481.2049
35	98.3609	80	234.4885	125	373.3557	170	458.1216	35	101.9469	80	244.0624	125	391.0560	170	481.9548
36	101.2399	81	237.6195	126	376.1411	171	458.7315	36	104.9370	81	247.3521	126	394.0284	171	482.6122
37	104.1328	82	240.7772	127	378.8776	172	459.3423	37	107.9421	82	250.6709	127	396.9494	172	483.2707
38	107.0401	83	243.9621	128	381.6347	173	459.7793	38	110.9628	83	254.0194	128	399.8935	173	483.7417
39	109.9270	84	247.1749	129	384.2698	174	460.2167	39	113.9628	84	257.3983	129	402.7081	174	484.2133
40	112.8289	85	250.2681	130	386.9960	175	460.5670	40	116.9789	85	260.6526	130	405.6210	175	484.5910
41	115.7463	86	253.4374	131	389.6700	176	460.8299	41	120.0117	86	263.9880	131	408.4791	176	484.8745
42	118.6795	87	256.6345	132	392.2176	177	461.0930	42	123.0615	87	267.3538	132	411.2029	177	485.1582
43	121.5931	88	259.8092	133	394.7829	178	461.2685	43	126.0915	88	270.6972	133	413.9465	178	485.3474
44	124.5230	89	263.0120	134	397.3662	179	461.3563	44	129.1392	89	274.0712	134	416.7102	179	485.4421
45	127.4334	90	266.1917	135	399.8186	180	461.4441	45	132.1672	90	277.4222	135	419.3345	180	485.5367

295 keV								300 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	2.9634	46	140.2078	91	292.5069	136	442.6316	1	3.0647	46	145.2671	91	304.6322	136	464.1348
2	5.9272	47	143.3967	92	296.0468	137	445.3959	2	6.1298	47	148.5830	92	308.3638	137	467.0967
3	8.9259	48	146.6064	93	299.5619	138	448.0927	3	9.2311	48	151.9213	93	312.0707	138	469.9870
4	11.8920	49	149.7970	94	303.1106	139	450.8082	4	12.2987	49	155.2404	94	315.8143	139	472.8983
5	14.8599	50	153.0499	95	306.6335	140	453.4543	5	15.3682	50	158.6251	95	319.5320	140	475.7359
6	17.8300	51	156.2842	96	310.1902	141	456.1183	6	18.4401	51	161.9914	96	323.2868	141	478.5937
7	20.8028	52	159.5411	97	313.7812	142	458.7108	7	21.5149	52	165.3821	97	327.0793	142	481.3756
8	23.7788	53	162.7796	98	317.2839	143	461.2302	8	24.5930	53	168.7543	98	330.7799	143	484.0799
9	26.7926	54	166.0413	99	320.8200	144	463.6750	9	27.7105	54	172.1516	99	334.5171	144	486.7048
10	29.7764	55	169.2846	100	324.3272	145	466.1351	10	30.7970	55	175.5306	100	338.2251	145	489.3468
11	32.7302	56	172.5943	101	327.8678	146	468.5186	11	33.8527	56	178.9796	101	341.9700	146	491.9073
12	35.7234	57	175.8861	102	331.3784	147	470.8240	12	36.9492	57	182.4109	102	345.6844	147	494.3846
13	38.7220	58	179.1597	103	334.9226	148	473.0499	13	40.0516	58	185.8242	103	349.4358	148	496.7771
14	41.6920	59	182.4583	104	338.4355	149	475.2884	14	43.1246	59	189.2645	104	353.1555	149	499.1836
15	44.7029	60	185.7825	105	341.9160	150	477.4454	15	46.2401	60	192.7324	105	356.8423	150	501.5033
16	47.7206	61	189.0887	106	345.4295	151	479.5197	16	49.3629	61	196.1825	106	360.5653	151	503.7344
17	50.7109	62	192.4211	107	348.9091	152	481.5098	17	52.4576	62	199.6609	107	364.2539	152	505.8754
18	53.7087	63	195.7353	108	352.4217	153	483.6053	18	55.5604	63	203.1213	108	367.9787	153	508.1305
19	56.7147	64	199.1216	109	355.8991	154	485.4239	19	58.6719	64	206.6580	109	371.6678	154	510.0880
20	59.7292	65	202.4902	110	359.3402	155	487.3472	20	61.7925	65	210.1774	110	375.3196	155	512.1586
21	62.7528	66	205.8409	111	362.8132	156	489.0861	21	64.9229	66	213.6789	111	379.0068	156	514.0311
22	68.3329	67	209.2194	112	366.2485	157	490.8326	22	70.7009	67	217.2106	112	382.6551	157	515.9121
23	68.7936	68	212.6264	113	369.6444	158	492.4890	23	71.1780	68	220.7732	113	386.2631	158	517.6964
24	71.8471	69	216.0154	114	373.0715	159	494.0542	24	74.3404	69	224.3181	114	389.9055	159	519.3829
25	74.8759	70	219.3858	115	376.5302	160	495.6256	25	77.4775	70	227.8446	115	393.5829	160	521.0762
26	77.9517	71	222.8333	116	379.8749	161	497.0055	26	80.6638	71	231.4528	116	397.1405	161	522.5635
27	80.9676	72	226.2141	117	383.2497	162	498.3902	27	83.7885	72	234.9923	117	400.7313	162	524.0561
28	84.0315	73	229.6732	118	386.6550	163	499.7796	28	86.9633	73	238.6151	118	404.3559	163	525.5541

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

295 keV								300 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
29	87.0719	74	233.1139	119	389.9412	164	500.9743	29	90.1142	74	242.2197	119	407.8552	164	526.8424
30	90.1616	75	236.5853	120	393.2564	165	502.1726	30	93.3166	75	245.8576	120	411.3864	165	528.1347
31	93.2284	76	239.9876	121	396.5245	166	503.2741	31	96.4959	76	249.4243	121	414.8688	166	529.3228
32	96.3092	77	243.4709	122	399.8210	167	504.3786	32	99.6901	77	253.0771	122	418.3829	167	530.5143
33	99.4043	78	246.9350	123	403.0688	168	505.2845	33	102.8997	78	256.7109	123	421.8461	168	531.4916
34	102.5145	79	250.3790	124	406.2662	169	506.1925	34	106.1254	79	260.3250	124	425.2569	169	532.4713
35	105.6027	80	253.9065	125	409.4907	170	507.0013	35	109.3290	80	264.0279	125	428.6979	170	533.3440
36	108.7067	81	257.3618	126	412.6631	171	507.7103	36	112.5493	81	267.6562	126	432.0844	171	534.1091
37	111.8267	82	260.8489	127	415.7817	172	508.4205	37	115.7870	82	271.3192	127	435.4147	172	534.8757
38	114.9634	83	264.3685	128	418.9260	173	508.9285	38	119.0426	83	275.0175	128	438.7735	173	535.4240
39	118.0793	84	267.9212	129	421.9330	174	509.4372	39	122.2771	84	278.7520	129	441.9868	174	535.9731
40	121.2125	85	271.3440	130	425.0460	175	509.8447	40	125.5303	85	282.3511	130	445.3146	175	536.4129
41	124.3635	86	274.8533	131	428.1015	176	510.1505	41	128.8026	86	286.0426	131	448.5819	176	536.7431
42	127.5330	87	278.3958	132	431.0143	177	510.4565	42	132.0948	87	289.7702	132	451.6977	177	537.0735
43	130.6825	88	281.9160	133	433.9493	178	510.6607	43	135.3668	88	293.4757	133	454.8383	178	537.2939
44	133.8510	89	285.4697	134	436.9066	179	510.7628	44	138.6594	89	297.2178	134	458.0039	179	537.4041
45	136.9997	90	289.0003	135	439.7158	180	510.8650	45	141.9320	90	300.9370	135	461.0118	180	537.5144

305 keV								310 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	3.1677	46	150.4305	91	317.1372	136	486.6221	1	3.2724	46	155.6990	91	330.0348	136	510.1526
2	6.3358	47	153.8768	92	321.0704	137	489.7967	2	6.5453	47	159.2794	92	334.1798	137	513.5568
3	9.5415	48	157.3472	93	324.9788	138	492.8957	3	9.8570	48	162.8856	93	338.3003	138	516.8809
4	12.7123	49	160.7986	94	328.9275	139	496.0182	4	13.1327	49	166.4729	94	342.4649	139	520.2314
5	15.8851	50	164.3190	95	332.8504	140	499.0626	5	16.4105	50	170.1328	95	346.6039	140	523.4992
6	19.0605	51	167.8210	96	336.8139	141	502.1295	6	19.6912	51	173.7745	96	350.7872	141	526.7922
7	22.2390	52	171.3493	97	340.8188	142	505.1160	7	22.9751	52	177.4445	97	355.0160	142	529.9999
8	25.4211	53	174.8594	98	344.7280	143	508.0200	8	26.2629	53	181.0965	98	359.1453	143	533.1200
9	28.6439	54	178.3964	99	348.6775	144	510.8396	9	29.5929	54	184.7774	99	363.3189	144	536.1503
10	31.8349	55	181.9152	100	352.5976	145	513.6784	10	32.8902	55	188.4405	100	367.4630	145	539.2022
11	34.9942	56	185.5080	101	356.5581	146	516.4304	11	36.1549	56	192.1815	101	371.6515	146	542.1616
12	38.1960	57	189.0833	102	360.4881	147	519.0937	12	39.4637	57	195.9053	102	375.8093	147	545.0265
13	41.4040	58	192.6407	103	364.4586	148	521.6665	13	42.7791	58	199.6115	103	380.0117	148	547.7947
14	44.5818	59	196.2273	104	368.3971	149	524.2551	14	46.0636	59	203.3492	104	384.1819	149	550.5808
15	47.8038	60	199.8437	105	372.3022	150	526.7509	15	49.3939	60	207.1191	105	388.3184	150	553.2677
16	51.0336	61	203.4426	106	376.2473	151	529.1521	16	52.7327	61	210.8717	106	392.4989	151	555.8534
17	54.2346	62	207.0720	107	380.1574	152	531.4568	17	56.0419	62	214.6573	107	396.6440	152	558.3360
18	57.4443	63	210.6837	108	384.1075	153	533.8849	18	59.3604	63	218.4255	108	400.8331	153	560.9520
19	60.6632	64	214.3761	109	388.0211	154	535.9931	19	62.6888	64	222.2791	109	404.9852	154	563.2239
20	63.8920	65	218.0515	110	391.8968	155	538.2236	20	66.0277	65	226.1162	110	409.0986	155	565.6282
21	67.1311	66	221.7094	111	395.8114	156	540.2412	21	69.3776	66	229.9361	111	413.2552	156	567.8034
22	73.1109	67	225.3999	112	399.6864	157	542.2682	22	75.5630	67	233.7913	112	417.3712	157	569.9895
23	73.6047	68	229.1240	113	403.5199	158	544.1916	23	76.0738	68	237.6828	113	421.4448	158	572.0640
24	76.8781	69	232.8306	114	407.3915	159	546.0097	24	79.4604	69	241.5572	114	425.5606	159	574.0255
25	80.1258	70	236.5191	115	411.3018	160	547.8356	25	82.8209	70	245.4141	115	429.7191	160	575.9958
26	83.4248	71	240.2943	116	415.0862	161	549.4397	26	86.2349	71	249.3628	116	433.7453	161	577.7269
27	86.6604	72	243.9989	117	418.9074	162	551.0498	27	89.5837	72	253.2390	117	437.8122	162	579.4649
28	89.9485	73	247.7918	118	422.7660	163	552.6659	28	92.9872	73	257.2089	118	441.9207	163	581.2097
29	93.2122	74	251.5669	119	426.4926	164	554.0560	29	96.3661	74	261.1615	119	445.8901	164	582.7107
30	96.5298	75	255.3783	120	430.2547	165	555.4506	30	99.8013	75	265.1533	120	449.8989	165	584.2168
31	99.8239	76	259.1162	121	433.9661	166	556.7329	31	103.2127	76	269.0697	121	453.8553	166	585.6019
32	103.1339	77	262.9457	122	437.7127	167	558.0191	32	106.6411	77	273.0833	122	457.8507	167	586.9913
33	106.4606	78	266.7565	123	441.4065	168	559.0742	33	110.0874	78	277.0788	123	461.7913	168	588.1313
34	109.8044	79	270.5479	124	445.0457	169	560.1320	34	113.5520	79	281.0553	124	465.6752	169	589.2742
35	113.1259	80	274.4339	125	448.7184	170	561.0744	35	116.9941	80	285.1324	125	469.5964	170	590.2926
36	116.4654	81	278.2430	126	452.3343	171	561.9006	36	120.4555	81	289.1302	126	473.4584	171	591.1856
37	119.8235	82	282.0897	127	455.8916	172	562.7285	37	123.9368	82	293.1691	127	477.2591	172	592.0804
38	123.2008	83	285.9750	128	459.4805	173	563.3208	38	127.4386	83	297.2499	128	481.0952	173	592.7206
39	126.5569	84	289.8996	129	462.9153	174	563.9139	39	130.9192	84	301.3735	129	484.7678	174	593.3618
40	129.9329	85	293.6834	130	466.4736	175	564.3890	40	134.4211	85	305.3506	130	488.5739	175	593.8753
41	133.3296	86	297.5656	131	469.9686	176	564.7456	41	137.9452	86	309.4326	131	492.3137	176	594.2609
42	136.7475	87	301.4873	132	473.3027	177	565.1025	42	141.4921	87	313.5577	132	495.8826	177	594.6468

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

305 keV								310 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
43	140.1453	88	305.3871	133	476.6643	178	565.3406	43	145.0188	88	317.6613	133	499.4822	178	594.9042
44	143.5651	89	309.3269	134	480.0539	179	565.4598	44	148.5692	89	321.8085	134	503.1131	179	595.0330
45	146.9649	90	313.2439	135	483.2758	180	565.5789	45	152.0996	90	352.9334	135	506.5656	180	595.1618

315 keV								320 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	3.3788	46	161.0739	91	343.3384	136	534.7907	1	3.4869	46	166.5561	91	357.0620	136	560.6063
2	6.7582	47	164.7918	92	347.7061	137	538.4428	2	6.9744	47	170.4154	92	361.6641	137	564.5264
3	10.1776	48	168.5376	93	352.0498	138	542.0102	3	10.5033	48	174.3045	93	366.2426	138	568.3570
4	13.5599	49	172.2646	94	356.4416	139	545.6071	4	13.9940	49	178.1751	94	370.8738	139	572.2207
5	16.9446	50	176.0680	95	360.8082	140	549.1165	5	17.4872	50	182.1261	95	375.4803	140	575.9917
6	20.3322	51	179.8535	96	365.2234	141	552.6542	6	20.9834	51	186.0595	96	380.1399	141	579.7945
7	23.7233	52	183.6693	97	369.6883	142	556.1014	7	24.4835	52	190.0254	97	384.8540	142	583.5012
8	27.1185	53	187.4674	98	374.0500	143	559.4554	8	27.9879	53	193.9740	98	389.4611	143	587.1091
9	30.5575	54	191.2967	99	378.4601	144	562.7141	9	31.5377	54	197.9561	99	394.1212	144	590.6155
10	33.9628	55	195.1083	100	382.8410	145	565.9969	10	35.0528	55	201.9209	100	398.7523	145	594.1491
11	37.3347	56	199.0022	101	387.2706	146	569.1814	11	38.5337	56	205.9724	101	403.4369	146	597.5778
12	40.7523	57	202.8792	102	391.6695	147	572.2650	12	42.0619	57	210.0075	102	408.0910	147	600.8991
13	44.1770	58	206.7391	103	396.1173	148	575.2455	13	45.5977	58	214.0260	103	412.7989	148	604.1103
14	47.5699	59	210.6328	104	400.5330	149	578.2460	14	49.1010	59	218.0808	104	417.4746	149	607.3441
15	51.0106	60	214.5612	105	404.9147	150	581.1405	15	52.6538	60	222.1730	105	422.1164	150	610.4645
16	54.4602	61	218.4728	106	409.3448	151	583.9268	16	56.2161	61	226.2489	106	426.8114	151	613.4691
17	57.8795	62	222.4199	107	413.7392	152	586.6027	17	59.7475	62	230.3631	107	431.4707	152	616.3554
18	61.3088	63	226.3501	108	418.1822	153	589.4231	18	63.2895	63	234.4609	108	436.1833	153	619.3986
19	64.7486	64	230.3706	109	422.5877	154	591.8732	19	66.8428	64	238.6542	109	440.8583	154	622.0428
20	68.1996	65	234.3751	110	426.9540	155	594.4667	20	70.4080	65	242.8320	110	445.4935	155	624.8425

315 keV								320 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
21	71.6625	66	238.3629	111	431.3678	156	596.8136	21	73.9858	66	246.9939	111	450.1813	156	627.3767
22	78.0574	67	242.3889	112	435.7404	157	599.1727	22	80.5940	67	251.1970	112	454.8273	157	629.9246
23	78.5855	68	246.4541	113	440.0699	158	601.4120	23	81.1399	68	255.4423	113	459.4293	158	632.3438
24	82.0875	69	250.5028	114	444.4458	159	603.5298	24	84.7594	69	259.6719	114	464.0827	159	634.6321
25	85.5629	70	254.5344	115	448.8690	160	605.6574	25	88.3519	70	263.8850	115	468.7884	160	636.9315
26	89.0941	71	258.6634	116	453.1532	161	607.5272	26	92.0026	71	268.2014	116	473.3482	161	638.9527
27	92.5583	72	262.7180	117	457.4826	162	609.4047	27	95.5847	72	272.4414	117	477.9581	162	640.9827
28	96.0798	73	266.8719	118	461.8581	163	611.2899	28	99.2263	73	276.7869	118	482.6189	163	643.0213
29	99.5761	74	271.0092	119	466.0871	164	612.9120	29	102.8426	74	281.1164	119	487.1256	164	644.7758
30	103.1314	75	275.1891	120	470.3598	165	614.5398	30	106.5204	75	285.4921	120	491.6809	165	646.5367
31	106.6625	76	279.2913	121	474.5783	166	616.0371	31	110.1738	76	289.7880	121	496.1802	166	648.1566
32	110.2120	77	283.4969	122	478.8401	167	617.5392	32	113.8468	77	294.1937	122	500.7276	167	649.7821
33	113.7804	78	287.6850	123	483.0453	168	618.7719	33	117.5401	78	298.5827	123	505.2165	168	651.1162
34	117.3685	79	291.8546	124	487.1915	169	620.0078	34	121.2543	79	302.9540	124	509.6443	169	652.4540
35	120.9339	80	296.1313	125	491.3792	170	621.1093	35	124.9458	80	307.4392	125	514.1181	170	653.6463
36	124.5199	81	300.3265	126	495.5053	171	622.0752	36	128.6593	81	311.8405	126	518.5280	171	654.6920
37	128.1273	82	304.5661	127	499.5676	172	623.0431	37	132.3956	82	316.2902	127	522.8715	172	655.7400
38	131.7566	83	308.8514	128	503.6693	173	623.7357	38	136.1555	83	320.7894	128	527.2588	173	656.4900
39	135.3646	84	313.1834	129	507.5976	174	624.4294	39	139.8939	84	325.3394	129	531.4625	174	657.2412
40	138.9956	85	317.3629	130	511.6704	175	624.9850	40	143.6570	85	329.7310	130	535.8223	175	657.8429
41	142.6502	86	321.6543	131	515.6737	176	625.4022	41	147.4454	86	334.2419	131	540.1096	176	658.2948
42	146.3293	87	325.9926	132	519.4954	177	625.8198	42	151.2599	87	338.8039	132	544.2040	177	658.7470
43	149.9882	88	330.3101	133	523.3516	178	626.0984	43	155.0544	88	343.3457	133	548.3369	178	659.0488
44	153.6725	89	334.6751	134	527.2427	179	626.2377	44	158.8761	89	347.9394	134	552.5088	179	659.1997
45	157.3369	90	339.0182	135	530.9439	180	626.3771	45	162.6780	90	352.5119	135	556.4787	180	659.3507

325 keV								330 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	G
1	3.5967	46	172.1468	91	371.2205	136	587.6755	1	3.7083	46	177.8473	91	385.8296	136	616.0815
2	7.1941	47	176.1513	92	376.0692	137	591.8858	2	7.4172	47	182.0008	92	390.9379	137	620.6063
3	10.8342	48	180.1877	93	380.8951	138	596.0015	3	11.1702	48	186.1885	93	396.0243	138	625.0312
4	14.4349	49	184.2059	94	385.7785	139	600.1543	4	14.8827	49	190.3585	94	401.1736	139	629.4977

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

325 keV								330 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
5	18.0383	50	188.3086	95	390.6379	140	604.2089	5	18.5981	50	194.6171	95	406.2997	140	633.8603
6	21.6450	51	192.3941	96	395.5554	141	608.2993	6	22.3169	51	198.8592	96	411.4895	141	638.2631
7	25.2557	52	196.5146	97	400.5326	142	612.2877	7	26.0400	52	203.1387	97	416.7444	142	642.5578
8	28.8711	53	200.6181	98	405.3988	143	616.1713	8	29.7681	53	207.4017	98	421.8846	143	646.7412
9	32.5334	54	204.7576	99	410.3232	144	619.9469	9	33.5447	54	211.7034	99	427.0884	144	650.8097
10	36.1601	55	208.8803	100	415.2190	145	623.7531	10	37.2849	55	215.9888	100	432.2643	145	654.9127
11	39.7518	56	213.0943	101	420.1735	146	627.4476	11	40.9891	56	220.3704	101	437.5046	146	658.8967
12	43.3925	57	217.2926	102	425.0978	147	631.0275	12	44.7441	57	224.7370	102	442.7153	147	662.7585
13	47.0413	58	221.4747	103	430.0812	148	634.4899	13	48.5077	58	229.0880	103	447.9909	148	666.4947
14	50.6567	59	225.6959	104	435.0328	149	637.9776	14	52.2372	59	233.4810	104	453.2351	149	670.2596
15	54.3236	60	229.9573	105	439.9506	150	641.3442	15	56.0200	60	237.9173	105	458.4459	150	673.8948
16	58.0006	61	234.2031	106	444.9269	151	644.5869	16	59.8136	61	242.3386	106	463.7211	151	677.3973
17	61.6460	62	238.4900	107	449.8674	152	647.7027	17	63.5750	62	246.8043	107	468.9607	152	680.7639
18	65.3027	63	242.7613	108	454.8668	153	650.9888	18	67.3483	63	251.2551	108	474.2652	153	684.3155
19	68.9714	64	247.1335	109	459.8284	154	653.8450	19	71.1345	64	255.8124	109	479.5319	154	687.4034
20	72.6528	65	251.4910	110	464.7501	155	656.8699	20	74.9341	65	260.3561	110	484.7586	155	690.6746
21	76.3476	66	255.8333	111	469.7296	156	659.6085	21	78.7481	66	264.8853	111	490.0492	156	693.6371
22	83.1732	67	260.2199	112	474.6669	157	662.3628	22	85.7949	67	269.4624	112	495.2974	157	696.6172
23	83.7371	68	264.6522	113	479.5597	158	664.9785	23	86.3771	68	274.0886	113	500.5005	158	699.4481
24	87.4763	69	269.0696	114	484.5093	159	667.4533	24	90.2384	69	278.7009	114	505.7664	159	702.1272
25	91.1882	70	273.4712	115	489.5168	160	669.9407	25	94.0719	70	283.2984	115	511.0964	160	704.8205
26	94.9608	71	277.9824	116	494.3711	161	672.1276	26	97.9686	71	288.0120	116	516.2658	161	707.1891
27	98.6629	72	282.4152	117	499.2808	162	674.3244	27	101.7931	72	292.6453	117	521.4964	162	709.5688
28	102.4271	73	286.9599	118	504.2470	163	676.5310	28	105.6824	73	297.3973	118	526.7897	163	711.9597
29	106.1658	74	291.4896	119	509.0512	164	678.4304	29	109.5459	74	302.1354	119	531.9126	164	714.0180
30	109.9686	75	296.0692	120	513.9091	165	680.3371	30	113.4762	75	306.9275	120	537.0952	165	716.0848
31	113.7469	76	300.5670	121	518.7096	166	682.0915	31	117.3819	76	311.6357	121	542.2188	166	717.9867
32	117.5460	77	305.1814	122	523.5634	167	683.8521	32	121.3098	77	316.4678	122	547.4016	167	719.8957
33	121.3667	78	309.7801	123	528.3568	168	685.2973	33	125.2608	78	321.2853	123	552.5222	168	721.4629
34	125.2100	79	314.3618	124	533.0870	169	686.7468	34	129.2357	79	326.0869	124	557.5776	169	723.0350
35	129.0303	80	319.0648	125	537.8684	170	688.0387	35	133.1878	80	331.0174	125	562.6900	170	724.4365
36	132.8741	81	323.6816	126	542.5836	171	689.1720	36	137.1649	81	335.8594	126	567.7338	171	725.6659
37	136.7423	82	328.3509	127	547.2296	172	690.3078	37	141.1680	82	340.7586	127	572.7058	172	726.8983
38	140.6357	83	333.0741	128	551.9246	173	691.1208	38	145.1979	83	345.7161	128	577.7324	173	727.7804
39	144.5077	84	337.8524	129	556.4249	174	691.9350	39	149.2067	84	350.7336	129	582.5526	174	728.6640
40	148.4060	85	342.4662	130	561.0943	175	692.5874	40	153.2435	85	355.5803	130	587.5562	175	729.3719
41	152.3314	86	347.2072	131	565.6879	176	693.0772	41	157.3092	86	360.5626	131	592.4806	176	729.9036
42	156.2848	87	352.0039	132	570.0767	177	693.5675	42	161.4048	87	365.6055	132	597.1875	177	730.4357
43	160.2183	88	356.7812	133	574.5084	178	693.8947	43	165.4808	88	370.6301	133	601.9424	178	730.7908
44	164.1808	89	361.6150	134	578.9838	179	694.0583	44	169.5878	89	375.7163	134	606.7462	179	730.9685
45	168.1239	90	366.4286	135	583.2442	180	694.2220	45	173.6756	90	380.7833	135	611.3211	180	731.1462

335 keV								340 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	3.8215	46	183.6587	91	400.9058	136	645.9151	1	3.9364	46	189.5822	91	416.4665	136	677.2757
2	7.6437	47	187.9653	92	406.2874	137	650.7812	2	7.8736	47	194.0460	92	422.1361	137	682.5129
3	11.5114	48	192.3084	93	411.6484	138	655.5419	3	11.8577	48	198.5488	93	427.7866	138	687.6389
4	15.3374	49	196.6342	94	417.0780	139	660.3494	4	15.7989	49	203.0348	94	433.5119	139	692.8174
5	19.1664	50	201.0533	95	422.4857	140	665.0469	5	19.7433	50	207.6188	95	439.2167	140	697.8796
6	22.9991	51	205.4564	96	427.9629	141	669.7896	6	23.6916	51	212.1874	96	444.9975	141	702.9927
7	26.8364	52	209.8995	97	433.5114	142	674.4178	7	27.6448	52	216.7989	97	450.8564	142	707.9844
8	30.6789	53	214.3268	98	438.9411	143	678.9276	8	31.6035	53	221.3954	98	456.5924	143	712.8506
9	34.5716	54	218.7955	99	444.4406	144	683.3154	9	35.6142	54	226.0361	99	462.4049	144	717.5868
10	38.4270	55	223.2486	100	449.9131	145	687.7420	10	39.5866	55	230.6621	100	468.1916	145	722.3669
11	42.2455	56	227.8030	101	455.4561	146	692.0419	11	43.5212	56	235.3947	101	474.0556	146	727.0120
12	46.1167	57	232.3432	102	460.9704	147	696.2113	12	47.5103	57	240.1139	102	479.8920	147	731.5179
13	49.9970	58	236.8686	103	466.5560	148	700.2466	13	51.5091	58	244.8193	103	485.8066	148	735.8804
14	53.8423	59	241.4391	104	472.1110	149	704.3143	14	55.4723	59	249.5731	104	491.6917	149	740.2795
15	57.7430	60	246.0560	105	477.6330	150	708.2433	15	59.4928	60	254.3766	105	497.5446	150	744.5302
16	61.6552	61	250.6588	106	483.2259	151	712.0300	16	63.5254	61	259.1672	106	503.4755	151	748.6284
17	65.5345	62	255.3094	107	488.7838	152	715.6710	17	67.5246	62	264.0089	107	509.3721	152	752.5702
18	69.4265	63	259.9459	108	494.4130	153	719.5133	18	71.5373	63	268.8376	108	515.3473	153	756.7313

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

19	73.3321	64	264.6950	109	500.0048	154	722.8549	19	75.5644	64	273.7853	109	521.2857	154	760.3513
20	77.2521	65	269.4314	110	505.5567	155	726.3960	20	79.6068	65	278.7215	110	527.1845	155	764.1887
21	81.1873	66	274.1544	111	511.1791	156	729.6038	21	83.6653	66	283.6454	111	533.1612	156	767.6660
22	88.4594	67	278.9290	112	516.7591	157	732.8316	22	91.1666	67	288.6248	112	539.0957	157	771.1659
23	89.0603	68	283.7566	113	522.2938	158	735.8987	23	91.7865	68	293.6613	113	544.9848	158	774.4925
24	93.0458	69	288.5713	114	527.8979	159	738.8019	24	95.8986	69	298.6862	114	550.9508	159	777.6423
25	97.0031	70	293.3723	115	533.5729	160	741.7214	25	99.9821	70	303.6986	115	556.9952	160	780.8105
26	101.0264	71	298.2962	116	539.0794	161	744.2894	26	104.1343	71	308.8412	116	562.8630	161	783.5980
27	104.9756	72	303.1381	117	544.6539	162	746.8700	27	108.2106	72	313.9002	117	568.8061	162	786.3998
28	108.9924	73	308.1059	118	550.2978	163	749.4634	28	112.3574	73	319.0925	118	574.8263	163	789.2162
29	112.9831	74	313.0610	119	555.7627	164	751.6966	29	116.4779	74	324.2736	119	580.6582	164	791.6419
30	117.0437	75	318.0744	120	561.2937	165	753.9392	30	120.6711	75	329.5177	120	586.5637	165	794.0784
31	121.0793	76	323.0020	121	566.7644	166	756.0034	31	124.8395	76	334.6740	121	592.4075	166	796.3214
32	125.1387	77	328.0612	122	572.3008	167	758.0757	32	129.0330	77	339.9702	122	598.3245	167	798.5736
33	129.2227	78	333.1070	123	577.7734	168	759.7772	33	133.2528	78	345.2544	123	604.1761	168	800.4233
34	133.3322	79	338.1382	124	583.1788	169	761.4842	34	137.4997	79	350.5254	124	609.9586	169	802.2791
35	137.4187	80	343.3066	125	588.6477	170	763.0062	35	141.7237	80	355.9424	125	615.8119	170	803.9341
36	141.5321	81	348.3842	126	594.0456	171	764.3415	36	145.9763	81	361.2664	126	621.5920	171	805.3863
37	145.6731	82	353.5237	127	599.3692	172	765.6802	37	150.2584	82	366.6576	127	627.2953	172	806.8423
38	149.8429	83	358.7267	128	604.7537	173	766.6385	38	154.5711	83	372.1176	128	633.0665	173	807.8846
39	153.9915	84	363.9948	129	609.9195	174	767.5985	39	158.8628	84	377.6483	129	638.6059	174	808.9289
40	158.1700	85	369.0856	130	615.2841	175	768.3677	40	163.1865	85	382.9952	130	644.3612	175	809.7658
41	162.3795	86	374.3211	131	620.5664	176	768.9454	41	167.5432	86	388.4962	131	650.0308	176	810.3943
42	166.6209	87	379.6223	132	625.6174	177	769.5237	42	171.9339	87	394.0689	132	655.4548	177	811.0235
43	170.8429	88	384.9067	133	630.7223	178	769.9096	43	176.3056	88	399.6262	133	660.9390	178	811.4434
44	175.0981	89	390.2582	134	635.8819	179	770.1026	44	180.7127	89	405.2565	134	666.4846	179	811.6534
45	179.3344	90	395.5917	135	640.7977	180	770.2957	45	185.1013	90	410.8705	135	671.7705	180	811.8636

345 keV								350 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	4.0530	46	195.6192	91	432.5300	136	710.2726	1	4.1714	46	201.7710	91	449.1157	136	745.0258
2	8.1069	47	200.2443	92	438.5032	137	715.9137	2	8.3437	47	206.5616	92	455.4090	137	751.1074
3	12.2091	48	204.9111	93	444.4589	138	721.4376	3	12.5657	48	211.3968	93	461.6868	138	757.0654
4	16.2672	49	209.5617	94	450.4964	139	727.0206	4	16.7424	49	216.2166	94	468.0539	139	763.0900
5	20.3287	50	214.3153	95	456.5150	140	732.4807	5	20.9228	50	221.1445	95	474.4042	140	768.9848
6	24.3944	51	219.0542	96	462.6168	141	737.9980	6	25.1076	51	226.0586	96	480.8453	141	774.9442
7	28.4652	52	223.8390	97	468.8038	142	743.3868	7	29.2977	52	231.0217	97	487.3797	142	780.7674
8	32.5419	53	228.6096	98	474.8642	143	748.6423	8	33.4941	53	235.9716	98	493.7834	143	786.4491
9	36.6723	54	233.4276	99	481.0081	144	753.7597	9	37.7461	54	240.9721	99	500.2787	144	791.9840
10	40.7635	55	238.2316	100	487.1278	145	758.9265	10	41.9579	55	245.9598	100	506.7515	145	797.5749
11	44.8160	56	243.1480	101	493.3323	146	763.9495	11	46.1301	56	251.0656	101	513.3173	146	803.0124
12	48.9250	57	248.0520	102	499.5105	147	768.8239	12	50.3607	57	256.1602	102	519.8587	147	808.2913
13	53.0442	58	252.9432	103	505.7747	148	773.5451	13	54.6022	58	261.2431	103	526.4944	148	813.4063
14	57.1270	59	257.8862	104	512.0106	149	778.3077	14	58.8065	59	266.3816	104	533.1035	149	818.5684
15	61.2692	60	262.8826	105	518.2156	150	782.9114	15	63.0724	60	271.5774	105	539.6832	150	823.5601
16	65.4243	61	267.8672	106	524.5063	151	787.3515	16	67.3520	61	276.7625	106	546.3572	151	828.3764
17	69.5453	62	272.9066	107	530.7637	152	791.6237	17	71.5967	62	282.0066	107	552.9993	152	833.0122
18	73.6807	63	277.9343	108	537.1077	153	796.1352	18	75.8568	63	287.2402	108	559.7369	153	837.9096
19	77.8313	64	283.0877	109	543.4159	154	800.0614	19	80.1331	64	292.6065	109	566.4399	154	842.1732
20	81.9982	65	288.2308	110	549.6852	155	804.2246	20	84.4265	65	297.9641	110	573.1050	155	846.6957
21	86.1822	66	293.3630	111	556.0404	156	807.9984	21	88.7381	66	303.3122	111	579.8650	156	850.7965
22	93.9169	67	298.5549	112	562.3539	157	811.7981	22	96.7102	67	308.7246	112	586.5841	157	854.9268
23	94.5561	68	303.8083	113	568.6224	158	815.4105	23	97.3692	68	314.2030	113	593.2588	158	858.8548
24	98.7970	69	309.0514	114	574.9757	159	818.8319	24	101.7411	69	319.6729	114	600.0274	159	862.5763
25	103.0090	70	314.2835	115	581.4160	160	822.2743	25	106.0840	70	325.1333	115	606.8923	160	866.3216
26	107.2924	71	319.6535	116	587.6713	161	825.3039	26	110.5011	71	330.7398	116	613.5635	161	869.6187
27	111.4983	72	324.9382	117	594.0101	162	828.3498	27	114.8390	72	336.2594	117	620.3273	162	872.9345
28	115.7775	73	330.3643	118	600.4342	163	831.4122	28	119.2531	73	341.9289	118	627.1859	163	876.2691
29	120.0303	74	335.7808	119	606.6608	164	834.0504	29	123.6408	74	347.5906	119	633.8370	164	879.1425
30	124.3590	75	341.2654	120	612.9690	165	836.7010	30	128.1075	75	353.3259	120	640.5789	165	882.0300
31	128.6626	76	346.6602	121	619.2145	166	839.1416	31	132.5492	76	358.9696	121	647.2572	166	884.6893
32	132.9931	77	352.2037	122	625.5414	167	841.5927	32	137.0194	77	364.7711	122	654.0262	167	887.3607
33	137.3515	78	357.7369	123	631.8016	168	843.6060	33	141.5192	78	370.5643	123	660.7273	168	889.5553
34	141.7387	79	363.2585	124	637.9909	169	845.6264	34	146.0498	79	376.3479	124	667.3560	169	891.7581
35	146.1032	80	368.9354	125	644.2591	170	847.4284	35	150.5578	80	382.2966	125	674.0728	170	893.7231
36	150.4981	81	374.5172	126	650.4522	171	849.0098	36	155.0980	81	388.1483	126	680.7125	171	895.4477

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

345 keV								350 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
37	154.9244	82	380.1718	127	656.5658	172	850.5956	37	159.6717	82	394.0788	127	687.2704	172	897.1774
38	159.3833	83	385.9011	128	662.7554	173	851.7309	38	164.2801	83	400.0902	128	693.9132	173	898.4159
39	163.8215	84	391.7071	129	668.6993	174	852.8686	39	168.8681	84	406.1848	129	700.2956	174	899.6571
40	168.2937	85	397.3225	130	674.8779	175	853.7803	40	173.4924	85	412.0821	130	706.9335	175	900.6518
41	172.8011	86	403.1024	131	680.9675	176	854.4650	41	178.1541	86	418.1547	131	713.4791	176	901.3990
42	177.3448	87	408.9601	132	686.7961	177	855.1506	42	182.8545	87	424.3119	132	719.7473	177	902.1471
43	181.8699	88	414.8043	133	692.6923	178	855.6081	43	187.5368	88	430.4578	133	726.0913	178	902.6463
44	186.4328	89	420.7279	134	698.6572	179	855.8370	44	192.2593	89	436.6900	134	732.5125	179	902.8961
45	190.9776	90	426.6371	135	704.3455	180	856.0660	45	196.9644	90	442.9100	135	738.6390	180	903.1460
355 keV								360 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	4.2914	46	208.0388	91	466.2441	136	781.6676	1	4.4132	46	214.4241	91	483.9369	136	820.3444
2	8.5838	47	212.9995	92	472.8751	137	788.2304	2	8.8273	47	219.5592	92	490.9242	137	827.4336
3	12.9274	48	218.0076	93	479.4929	138	794.6629	3	13.2942	48	224.7450	93	497.9012	138	834.3858
4	17.2245	49	223.0012	94	486.2082	139	801.1706	4	17.7134	49	229.9172	94	504.9845	139	841.4229
5	21.5254	50	228.1082	95	492.9091	140	807.5412	5	22.1366	50	235.2084	95	512.0562	140	848.3153
6	25.8310	51	233.2025	96	499.7092	141	813.9848	6	26.5648	51	240.4880	96	519.2365	141	855.2903
7	30.1423	52	238.3492	97	506.6114	142	820.2842	7	30.9989	52	245.8235	97	526.5282	142	862.1127
8	34.4602	53	243.4836	98	513.3789	143	826.4335	8	35.4401	53	251.1480	98	533.6815	143	868.7759
9	38.8355	54	248.6722	99	520.2468	144	832.4266	9	39.9406	54	256.5303	99	540.9446	144	875.2730
10	43.1697	55	253.8491	100	527.0943	145	838.4832	10	44.3989	55	261.9021	100	548.1901	145	881.8421
11	47.4634	56	259.1502	101	534.0439	146	844.3763	11	48.8160	56	267.4047	101	555.5475	146	888.2370
12	51.8176	57	264.4415	102	540.9712	147	850.1000	12	53.2955	57	272.8989	102	562.8852	147	894.4511
13	56.1832	58	269.7224	103	548.0020	148	855.6485	13	57.7872	58	278.3841	103	570.3367	148	900.4776
14	60.5109	59	275.0627	104	555.0084	149	861.2504	14	62.2402	59	283.9330	104	577.7663	149	906.5649
355 keV								360 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	G
15	64.9024	60	280.4645	105	561.9873	150	866.6697	15	66.7592	60	289.5475	105	585.1707	150	912.4564
16	69.3084	61	285.8569	106	569.0700	151	871.9007	16	71.2935	61	295.1545	106	592.6894	151	918.1456
17	73.6789	62	291.3127	107	576.1226	152	876.9376	17	75.7919	62	300.8292	107	600.1803	152	923.6260
18	78.0657	63	296.7594	108	583.2803	153	882.2609	18	80.3074	63	306.4966	108	607.7871	153	929.4204
19	82.4696	64	302.3463	109	590.4052	154	886.8970	19	84.8411	64	312.3119	109	615.3632	154	934.4689
20	86.8918	65	307.9262	110	597.4936	155	891.8165	20	89.3941	65	318.1222	110	622.9047	155	939.8280
21	91.3332	66	313.4982	111	604.6868	156	896.2789	21	93.9675	66	323.9264	111	630.5620	156	944.6911
22	99.5467	67	319.1393	112	611.8405	157	900.7748	22	102.4267	67	329.8049	112	638.1815	157	949.5925
23	100.2258	68	324.8514	113	618.9506	158	905.0521	23	103.1261	68	335.7596	113	645.7590	158	954.2571
24	104.7311	69	330.5568	114	626.1648	159	909.1056	24	107.7672	69	341.7097	114	653.4516	159	958.6793
25	109.2072	70	336.2545	115	633.4856	160	913.1866	25	112.3788	70	347.6540	115	661.2624	160	963.1328
26	113.7604	71	342.1070	116	640.6037	161	916.7801	26	117.0707	71	353.7624	116	668.8613	161	967.0556
27	118.2327	72	347.8710	117	647.8246	162	920.3949	27	121.6799	72	359.7809	117	676.5743	162	971.0029
28	122.7844	73	353.7940	118	655.1508	163	924.0314	28	126.3717	73	365.9679	118	684.4042	163	974.9749
29	127.3095	74	359.7113	119	662.2592	164	927.1657	29	131.0369	74	372.1515	119	692.0058	164	978.3994
30	131.9170	75	365.7079	120	669.4685	165	930.3161	30	135.7878	75	378.4207	120	699.7197	165	981.8423
31	136.4995	76	371.6112	121	676.6139	166	933.2182	31	140.5139	76	384.5950	121	707.3694	166	985.0148
32	141.1122	77	377.6823	122	683.8601	167	936.1342	32	145.2720	77	390.9474	122	715.1317	167	988.2030
33	145.7565	78	383.7471	123	691.0377	168	938.5302	33	150.0636	78	397.2961	123	722.8247	168	990.8234
34	150.4333	79	389.8046	124	698.1416	169	940.9356	34	154.8898	79	403.6399	124	730.4431	169	993.4545
35	155.0878	80	396.0376	125	705.3438	170	943.0817	35	159.6940	80	410.1705	125	738.1714	170	995.8024
36	159.7766	81	402.1717	126	712.4672	171	944.9656	36	164.5346	81	416.6003	126	745.8195	171	997.8638
37	164.5010	82	408.3912	127	719.5067	172	946.8552	37	169.4129	82	423.1226	127	753.3818	172	999.9318
38	169.2622	83	414.6984	128	726.6412	173	948.2085	38	174.3304	83	429.7399	128	761.0505	173	1001.4130
39	174.0036	84	421.0958	129	733.4997	174	949.5647	39	179.2285	84	436.4551	129	768.4266	174	1002.8976
40	178.7834	85	427.2889	130	740.6365	175	950.6518	40	184.1676	85	442.9587	130	776.1064	175	1004.0877
41	183.6031	86	433.6690	131	747.6780	176	951.4684	41	189.1490	86	449.6620	131	783.6878	176	1004.9817
42	188.4639	87	440.1410	132	754.4245	177	952.2861	42	194.1742	87	456.4650	132	790.9558	177	1005.8770
43	193.3073	88	446.6042	133	761.2562	178	952.8318	43	199.1826	88	463.2621	133	798.3195	178	1006.4746
44	198.1936	89	453.1613	134	768.1748	179	953.1048	44	204.2367	89	470.1613	134	805.7809	179	1006.7735
45	203.0631	90	459.7087	135	774.7791	180	953.3780	45	209.2747	90	477.0537	135	812.9073	180	1007.0726

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

365 keV								370 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	4.5366	46	220.9282	91	502.2169	136	861.2181	1	4.6618	46	227.5527	91	521.1085	136	904.4687
2	9.0743	47	226.2425	92	509.5805	137	868.8845	2	9.3246	47	233.0508	92	528.8695	137	912.7691
3	13.6662	48	231.6107	93	516.9370	138	876.4069	3	14.0433	48	238.6063	93	536.6273	138	920.9183
4	18.2092	49	236.9664	94	524.4095	139	884.0252	4	18.7118	49	244.1505	94	544.5116	139	929.1762
5	22.7564	50	242.4469	95	531.8738	140	891.4910	5	23.3847	50	249.8257	95	552.3915	140	937.2735
6	27.3088	51	247.9171	96	539.4565	141	899.0504	6	28.0632	51	255.4919	96	560.4009	141	945.4770
7	31.8676	52	253.4469	97	547.1612	142	906.4484	7	32.7484	52	261.2216	97	568.5436	142	953.5099
8	36.4339	53	258.9670	98	554.7238	143	913.6776	8	37.4415	53	266.9431	98	576.5406	143	961.3640
9	41.0612	54	264.5489	99	562.4066	144	920.7303	9	42.1976	54	272.7305	99	584.6693	144	969.0305
10	45.6457	55	270.1216	100	570.0749	145	927.8648	10	46.9098	55	278.5104	100	592.7872	145	976.7900
11	50.1879	56	275.8320	101	577.8660	146	934.8136	11	51.5790	56	284.4350	101	601.0397	146	984.3518
12	54.7946	57	281.5355	102	585.6405	147	941.5693	12	56.3148	57	290.3545	102	609.2795	147	991.7073
13	59.4142	58	287.2316	103	593.5400	148	948.1243	13	61.0642	58	296.2684	103	617.6566	148	998.8479
14	63.9944	59	292.9959	104	601.4207	149	954.7485	14	65.7735	59	302.2551	104	626.0186	149	1006.0675
15	68.6429	60	298.8304	105	609.2792	150	961.1627	15	70.5534	60	308.3170	105	634.3619	150	1013.0617
16	73.3076	61	304.6591	106	617.2634	151	967.3594	16	75.3505	61	314.3751	106	642.8437	151	1019.8222
17	77.9358	62	310.5604	107	625.2227	152	973.3315	17	80.1105	62	320.5108	107	651.3040	152	1026.3405
18	82.5821	63	316.4563	108	633.3098	153	979.6484	18	84.8897	63	326.6432	108	659.9053	153	1033.2385
19	87.2476	64	322.5083	109	641.3689	154	985.1545	19	89.6892	64	332.9404	109	668.4820	154	1039.2539
20	91.9336	65	328.5573	110	649.3959	155	991.0018	20	94.5103	65	339.2369	110	677.0297	155	1045.6448
21	96.6411	66	334.6024	111	657.5510	156	996.3101	21	99.3542	66	345.5318	111	685.7189	156	1051.4490
22	105.3501	67	340.7271	112	665.6704	157	1001.6621	22	108.3171	67	351.9122	112	694.3754	157	1057.3036
23	106.0703	68	346.9338	113	673.7498	158	1006.7577	23	109.0585	68	358.3805	113	702.9945	158	1062.8797
24	110.8495	69	353.1381	114	681.9568	159	1011.5901	24	113.9782	69	364.8491	114	711.7551	159	1068.1700
25	115.5991	70	359.3390	115	690.2948	160	1016.4584	25	118.8681	70	371.3167	115	720.6610	160	1073.5016
26	120.4321	71	365.7136	116	698.4115	161	1020.7481	26	123.8448	71	377.9683	116	729.3359	161	1078.2010
27	125.1807	72	371.9969	117	706.6549	162	1025.0658	27	128.7353	72	384.5274	117	738.1517	162	1082.9329
28	130.0152	73	378.4589	118	715.0282	163	1029.4120	28	133.7151	73	391.2760	118	747.1120	163	1087.6974
365 keV								370 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	G
29	134.8231	74	384.9202	119	723.1622	164	1033.1601	29	138.6685	74	398.0268	119	755.8217	164	1091.8076
30	139.7203	75	391.4737	120	731.4213	165	1036.9295	30	143.7147	75	404.8769	120	764.6707	165	1095.9424
31	144.5927	76	397.9308	121	739.6166	166	1040.4036	31	148.7364	76	411.6294	121	773.4568	166	1099.7543
32	149.4992	77	404.5771	122	747.9374	167	1043.8959	32	153.7942	77	418.5827	122	782.3831	167	1103.5873
33	154.4411	78	411.2226	123	756.1889	168	1046.7669	33	158.8895	78	425.5385	123	791.2406	168	1106.7390
34	159.4198	79	417.8658	124	764.3653	169	1049.6502	34	164.0238	79	432.4950	124	800.0228	169	1109.9051
35	164.3767	80	424.7079	125	772.6645	170	1052.2236	35	169.1367	80	439.6631	125	808.9426	170	1112.7314
36	169.3724	81	431.4474	126	780.8826	171	1054.4835	36	174.2907	81	446.7272	126	817.7807	171	1115.2138
37	174.4081	82	438.2871	127	789.0132	172	1056.7509	37	179.4872	82	453.8996	127	826.5302	172	1117.7050
38	179.4854	83	445.2298	128	797.2632	173	1058.3752	38	184.7279	83	461.1836	128	835.4136	173	1119.4898
39	184.5438	84	452.2784	129	805.2030	174	1060.0034	39	189.9503	84	468.5824	129	843.9683	174	1121.2791
40	189.6458	85	459.1083	130	813.4745	175	1061.3088	40	195.2189	85	475.7551	130	852.8859	175	1122.7139
41	194.7928	86	466.1512	131	821.6450	176	1062.2895	41	200.5353	86	483.1552	131	861.7001	176	1123.7919
42	199.9863	87	473.3025	132	829.4823	177	1063.2716	42	205.9012	87	490.6730	132	870.1600	177	1124.8715
43	205.1638	88	480.4510	133	837.4272	178	1063.9272	43	211.2520	88	498.1917	133	878.7413	178	1125.5922
44	210.3899	89	487.7107	134	845.4823	179	1064.2552	44	216.6544	89	505.8312	134	887.4468	179	1125.9528
45	215.6007	90	494.9667	135	853.1801	180	1064.5833	45	222.0424	90	513.4709	135	895.7712	180	1126.3136
375 keV								380 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	4.7886	46	234.2989	91	540.6372	136	950.2967	1	4.9172	46	241.1684	91	560.8303	136	998.9259
2	9.5784	47	239.9857	92	548.8184	137	959.2950	2	9.8355	47	247.0489	92	569.4558	137	1008.6942
3	14.4256	48	245.7336	93	557.0006	138	968.1348	3	14.8130	48	252.9943	93	578.0873	138	1018.2967
4	19.2213	49	251.4715	94	565.3209	139	977.0981	4	19.7376	49	258.9312	94	586.8695	139	1028.0396
5	24.0217	50	257.3467	95	573.6412	140	985.8923	5	24.6672	50	265.0121	95	595.6567	140	1037.6049
6	28.8279	51	263.2145	96	582.1030	141	994.8072	6	29.6030	51	271.0872	96	604.5987	141	1047.3078
7	33.6413	52	269.1500	97	590.7107	142	1003.5423	7	34.5462	52	277.2344	97	613.7001	142	1056.8210
8	38.4629	53	275.0789	98	599.1691	143	1012.0877	8	39.4982	53	283.3768	98	622.6490	143	1066.1335
9	43.3496	54	281.0780	99	607.7718	144	1020.4340	9	44.5173	54	289.5941	99	631.7560	144	1075.2347
10	48.1915	55	287.0714	100	616.3682	145	1028.8865	10	49.4906	55	295.8075	100	640.8619	145	1084.4572

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

375 keV								380 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
11	52.9894	56	293.2169	101	625.1122	146	1037.1283	11	54.4191	56	302.1808	101	650.1297	146	1093.4554
12	57.8562	57	299.3593	102	633.8479	147	1045.1496	12	59.4187	57	308.5532	102	659.3944	147	1102.2181
13	62.7373	58	305.4980	103	642.7344	148	1052.9408	13	64.4334	58	314.9240	103	668.8249	148	1110.7342
14	67.5776	59	311.7145	104	651.6104	149	1060.8225	14	69.4067	59	321.3780	104	678.2501	149	1119.3543
15	72.4909	60	318.0114	105	660.4718	150	1068.4623	15	74.4554	60	327.9178	105	687.6657	150	1127.7145
16	77.4224	61	324.3067	106	669.4859	151	1075.8505	16	79.5233	61	334.4584	106	697.2496	151	1135.8038
17	82.3162	62	330.6850	107	678.4825	152	1082.9776	17	84.5530	62	341.0879	107	706.8211	152	1143.6114
18	87.2303	63	337.0623	108	687.6348	153	1090.5237	18	89.6041	63	347.7188	108	716.5645	153	1151.8824
19	92.1659	64	343.6136	109	696.7667	154	1097.1074	19	94.6779	64	354.5333	109	726.2923	154	1159.1023
20	97.1243	65	350.1667	110	705.8732	155	1104.1053	20	99.7757	65	361.3525	110	735.9995	155	1166.7803
21	102.1068	66	356.7208	111	715.1364	156	1110.4638	21	104.8990	66	368.1755	111	745.8801	156	1173.7601
22	111.3280	67	363.3665	112	724.3707	157	1116.8802	22	114.3827	67	375.0967	112	755.7363	157	1180.8068
23	112.0908	68	370.1067	113	733.5707	158	1122.9941	23	115.1674	68	382.1193	113	765.5625	158	1187.5244
24	117.1534	69	376.8499	114	742.9277	159	1128.7969	24	120.3753	69	389.1480	114	775.5630	159	1193.9029
25	122.1862	70	383.5949	115	752.4461	160	1134.6474	25	125.5534	70	396.1816	115	785.7428	160	1200.3366
26	127.3090	71	390.5348	116	761.7237	161	1139.8062	26	130.8250	71	403.4216	116	795.6716	161	1206.0119
27	132.3440	72	397.3812	117	771.1578	162	1145.0023	27	136.0070	72	410.5672	117	805.7749	162	1211.7305
28	137.4719	73	404.4284	118	780.7530	163	1150.2363	28	141.2856	73	417.9258	118	816.0575	163	1217.4930
29	142.5734	74	411.4811	119	790.0857	164	1154.7530	29	146.5380	74	425.2933	119	826.0657	164	1222.4675
30	147.7714	75	418.6408	120	799.5740	165	1159.2980	30	151.8909	75	432.7762	120	836.2476	165	1227.4749
31	152.9453	76	425.7016	121	809.0009	166	1163.4895	31	157.2198	76	440.1592	121	846.3705	166	1232.0942
32	158.1573	77	432.9759	122	818.5844	167	1167.7052	32	162.5891	77	447.7689	122	856.6686	167	1236.7417
33	163.4091	78	440.2561	123	828.1003	168	1171.1727	33	168.0005	78	455.3885	123	866.9011	168	1240.5654
34	168.7022	79	447.5406	124	837.5416	169	1174.6566	34	173.4557	79	463.0162	124	877.0603	169	1244.4083
35	173.9744	80	455.0501	125	847.1369	170	1177.7675	35	178.8905	80	470.8836	125	887.3923	170	1247.8404
36	179.2902	81	462.4544	126	856.6506	171	1180.5003	36	184.3714	81	478.6444	126	897.6435	171	1250.8562
37	184.6510	82	469.9758	127	866.0751	172	1183.2434	37	189.9001	82	486.5320	127	907.8054	172	1253.8838
38	190.0586	83	477.6180	128	875.6501	173	1185.2090	38	195.4784	83	494.5504	128	918.1368	173	1256.0536
39	195.4487	84	485.3846	129	884.8768	174	1187.1798	39	201.0399	84	502.7035	129	928.0991	174	1258.2296
40	200.8878	85	492.9178	130	894.5010	175	1188.7603	40	206.6535	85	510.6156	130	938.4977	175	1259.9748
41	206.3777	86	500.6936	131	904.0200	176	1189.9479	41	212.3208	86	518.7869	131	948.7897	176	1261.2863
42	211.9201	87	508.5972	132	913.1621	177	1191.1374	42	218.0440	87	527.0969	132	958.6810	177	1262.6001
43	217.4483	88	516.5059	133	922.4413	178	1191.9314	43	223.7540	88	535.4167	133	968.7272	178	1263.4771
44	223.0314	89	524.5460	134	931.8609	179	1192.3288	44	229.5222	89	543.8794	134	978.9324	179	1263.9160
45	228.6012	90	532.5906	135	940.8738	180	1192.7263	45	235.2784	90	552.3515	135	988.7035	180	1264.3552

385 keV								390 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	G
1	5.0474	46	248.1627	91	581.7168	136	1050.6072	1	5.1794	46	255.2835	91	603.3273	136	1105.6228
2	10.0961	47	254.2420	92	590.8125	137	1061.2272	2	10.3601	47	261.5668	92	612.9208	137	1117.1870
3	15.2055	48	260.3902	93	599.9198	138	1071.6740	3	15.6032	48	267.9233	93	622.5324	138	1128.5709
4	20.2608	49	266.5316	94	609.1915	139	1082.2808	4	20.7908	49	274.2747	94	632.3233	139	1140.1377
5	25.3213	50	272.8239	95	618.4741	140	1092.7014	5	25.9840	50	280.7844	95	642.1318	140	1151.5097
6	30.3883	51	279.1123	96	627.9258	141	1103.2792	6	31.1840	51	287.2921	96	652.1252	141	1163.0615
7	35.4633	52	285.4773	97	637.5520	142	1113.6572	7	36.3924	52	293.8813	97	662.3095	142	1174.4034
8	40.5474	53	291.8396	98	647.0228	143	1123.8231	8	41.6104	53	300.4699	98	672.3357	143	1185.5215
9	45.7006	54	298.2816	99	656.6667	144	1133.7648	9	46.8997	54	307.1434	99	682.5519	144	1196.4018
10	50.8072	55	304.7218	100	666.3155	145	1143.8456	10	52.1414	55	313.8174	100	692.7797	145	1207.4423
11	55.8682	56	311.3301	101	676.1420	146	1153.6876	11	57.3366	56	320.6681	101	703.2027	146	1218.2284
12	61.0025	57	317.9398	102	685.9715	147	1163.2780	12	62.6074	57	327.5227	102	713.6357	147	1228.7461
13	66.1527	58	324.5503	103	695.9834	148	1172.6045	13	67.8951	58	334.3807	103	724.2693	148	1238.9810
14	71.2608	59	331.2496	104	705.9961	149	1182.0504	14	73.1400	59	341.3335	104	734.9110	149	1249.3537
15	76.4469	60	338.0406	105	716.0051	150	1191.2171	15	78.4655	60	348.3841	105	745.5560	150	1259.4264
16	81.6532	61	344.8349	106	726.1996	151	1200.0920	16	83.8122	61	355.4410	106	756.4057	151	1269.1845
17	86.8208	62	351.7243	107	736.3878	152	1208.6627	17	89.1198	62	362.5994	107	767.2559	152	1278.6139
18	92.0110	63	358.6179	108	746.7657	153	1217.7473	18	94.4512	63	369.7651	108	778.3160	153	1288.6149
19	97.2251	64	365.7052	109	757.1341	154	1225.6818	19	99.8078	64	377.1352	109	789.3737	154	1297.3549
20	102.4647	65	372.8003	110	767.4875	155	1234.1243	20	105.1912	65	384.5165	110	800.4232	155	1306.6597
21	107.7311	66	379.9024	111	778.0331	156	1241.8030	21	110.6030	66	391.9082	111	811.6856	156	1315.1275
22	117.4816	67	387.1097	112	788.5598	157	1249.5592	22	120.6246	67	399.4126	112	822.9360	157	1323.6854
23	118.2884	68	394.4257	113	799.0616	158	1256.9568	23	121.4540	68	407.0335	113	834.1678	158	1331.8519
24	123.6441	69	401.7512	114	809.7570	159	1263.9843	24	126.9600	69	414.6678	114	845.6149	159	1339.6138

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

385 keV								390 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
25	128.9700	70	409.0851	115	820.6519	160	1271.0758	25	132.4361	70	422.3142	115	857.2841	160	1347.4503
26	134.3929	71	416.6376	116	831.2857	161	1277.3341	26	138.0130	71	430.1920	116	868.6819	161	1354.3692
27	139.7247	72	424.0950	117	842.1138	162	1283.6428	27	143.4972	72	437.9743	117	880.2965	162	1361.3469
28	145.1567	73	431.7781	118	853.1421	163	1290.0024	28	149.0854	73	445.9959	118	892.1346	163	1368.3840
29	150.5628	74	439.4742	119	863.8837	164	1295.4945	29	154.6480	74	454.0349	119	903.6736	164	1374.4637
30	156.0733	75	447.2945	120	874.8193	165	1301.0249	30	160.3191	75	462.2076	120	915.4297	165	1380.5882
31	161.5603	76	455.0141	121	885.6994	166	1306.1285	31	165.9672	76	470.2790	121	927.1348	166	1386.2421
32	167.0900	77	462.9746	122	896.7757	167	1311.2649	32	171.6604	77	478.6064	122	939.0600	167	1391.9345
33	172.6642	78	470.9493	123	907.7893	168	1315.4921	33	177.4006	78	486.9528	123	950.9268	168	1396.6207
34	178.2847	79	478.9365	124	918.7319	169	1319.7417	34	183.1898	79	495.3166	124	962.7257	169	1401.3332
35	183.8855	80	487.1788	125	929.8687	170	1323.5381	35	188.9600	80	503.9519	125	974.7432	170	1405.5442
36	189.5351	81	495.3136	126	940.9263	171	1326.8747	36	194.7818	81	512.4791	126	986.6844	171	1409.2462
37	195.2353	82	503.5856	127	951.8956	172	1330.2251	37	200.6572	82	521.1546	127	998.5391	172	1412.9644
38	200.9880	83	511.9991	128	963.0557	173	1332.6268	38	206.5881	83	529.9833	128	1010.6094	173	1415.6302
39	206.7248	84	520.5585	129	973.8249	174	1335.0356	39	212.5043	84	538.9701	129	1022.2655	174	1418.3045
40	212.5168	85	528.8693	130	985.0739	175	1336.9678	40	218.4787	85	547.7006	130	1034.4502	175	1420.4499
41	218.3658	86	537.4570	131	996.2156	176	1338.4200	41	224.5137	86	556.7268	131	1046.5280	176	1422.0625
42	224.2740	87	546.1952	132	1006.9311	177	1339.8748	42	230.6113	87	565.9164	132	1058.1525	177	1423.6782
43	230.1702	88	554.9486	133	1017.8223	178	1340.8461	43	236.6982	88	575.1273	133	1069.9764	178	1424.7570
44	236.1282	89	563.8573	134	1028.8936	179	1341.3322	44	242.8507	89	584.5070	134	1082.0050	179	1425.2970
45	242.0754	90	572.7809	135	1039.5016	180	1341.8186	45	248.9938	90	593.9080	135	1093.5388	180	1425.8372

395 keV								400 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	G
1	5.3130	46	262.5324	91	625.6945	136	1164.2910	1	5.4484	46	269.9110	91	648.8531	136	1226.9721
2	10.6275	47	269.0250	92	635.8154	137	1176.9049	2	10.8983	47	276.6185	92	659.5330	137	1240.7566
3	16.0060	48	275.5954	93	645.9616	138	1189.3319	3	16.4139	48	283.4086	93	670.2466	138	1254.3480
4	21.3277	49	282.1627	94	656.3037	139	1201.9682	4	21.8715	49	290.1975	94	681.1740	139	1268.1798
5	26.6553	50	288.8957	95	666.6708	140	1214.4015	5	27.3352	50	297.1602	95	692.1351	140	1281.8005
6	31.9901	51	295.6289	96	677.2402	141	1227.0411	6	32.8065	51	304.1255	96	703.3174	141	1295.6588
7	37.3336	52	302.4490	97	688.0186	142	1239.4606	7	38.2869	52	311.1829	97	714.7285	142	1309.2871
8	42.6873	53	309.2706	98	698.6366	143	1251.6444	8	43.7781	53	318.2446	98	725.9776	143	1322.6675
9	48.1144	54	316.1826	99	709.4629	144	1263.5765	9	49.3448	54	325.4023	99	737.4551	144	1335.7820
10	53.4931	55	323.0976	100	720.3088	145	1275.6931	10	54.8623	55	332.5658	100	748.9613	145	1349.1099
11	58.8243	56	330.1983	101	731.3691	146	1287.5395	11	60.3314	56	339.9243	101	760.7033	146	1362.1509
12	64.2337	57	337.3057	102	742.4476	147	1299.0993	12	65.8811	57	347.2927	102	772.4728	147	1374.8863
13	69.6607	58	344.4194	103	753.7470	148	1310.3562	13	71.4495	58	354.6703	103	784.4856	148	1387.2974
14	75.0443	59	351.6340	104	765.0628	149	1321.7727	14	76.9737	59	362.1556	104	796.5246	149	1399.8939
15	80.5111	60	358.9531	105	776.3900	150	1332.8667	15	82.5839	60	369.7523	105	808.5845	150	1412.1437
16	86.0003	61	366.2816	106	787.9432	151	1343.6215	16	88.2177	61	377.3619	106	820.8940	151	1424.0276
17	91.4500	62	373.7185	107	799.5053	152	1354.0207	17	93.8115	62	385.0872	107	833.2222	152	1435.5267
18	96.9247	63	381.1662	108	811.2995	153	1365.0576	18	99.4316	63	392.8269	108	845.8073	153	1447.7395
19	102.4260	64	388.8294	109	823.0997	154	1374.7091	19	105.0797	64	400.7940	109	858.4085	154	1458.4266
20	107.9555	65	396.5076	110	834.8997	155	1384.9906	20	110.7576	65	408.7802	110	871.0190	155	1469.8190
21	113.5149	66	404.1998	111	846.9362	156	1394.3529	21	116.4669	66	416.7845	111	883.8921	156	1480.1996
22	123.8121	67	412.0129	112	858.9686	157	1403.8203	22	127.0440	67	424.9182	112	896.7709	157	1490.7033
23	124.6644	68	419.9507	113	870.9902	158	1412.8598	23	127.9196	68	433.1856	113	909.6481	158	1500.7385
24	130.3231	69	427.9061	114	883.2514	159	1421.4562	24	133.7336	69	441.4750	114	922.7924	159	1510.2873
25	135.9521	70	435.8777	115	895.7601	160	1430.1398	25	139.5180	70	449.7853	115	936.2127	160	1519.9385
26	141.6856	71	444.0945	116	907.9873	161	1437.8105	26	145.4109	71	458.3552	116	949.3415	161	1528.4687
27	147.3248	72	452.2154	117	920.4566	162	1445.5499	27	151.2077	72	466.8292	117	962.7411	162	1537.0797
28	153.0720	73	460.5901	118	933.1757	163	1453.3591	28	157.1168	73	475.5723	118	976.4203	163	1545.7727
29	158.7939	74	468.9871	119	945.5831	164	1460.1089	29	163.0010	74	484.3430	119	989.7752	164	1553.2902
30	164.6287	75	477.5280	120	958.2339	165	1466.9112	30	169.0024	75	493.2686	120	1003.4032	165	1560.8695
31	170.4409	76	485.9671	121	970.8396	166	1473.1933	31	174.9818	76	502.0923	121	1016.9937	166	1567.8723
32	176.3008	77	494.6784	122	983.6925	167	1479.5206	32	181.0116	77	511.2053	122	1030.8623	167	1574.9285
33	182.2103	78	503.4140	123	996.4925	168	1484.7314	33	187.0938	78	520.3487	123	1044.6854	168	1580.7417
34	188.1716	79	512.1724	124	1009.2295	169	1489.9731	34	193.2306	79	529.5206	124	1058.4520	169	1586.5915
35	194.1147	80	521.2198	125	1022.2128	170	1494.6585	35	199.3502	80	539.0005	125	1072.4965	170	1591.8221
36	200.1124	81	530.1589	126	1035.1239	171	1498.7785	36	205.5274	81	548.3719	126	1086.4748	171	1596.4230
37	206.1667	82	539.2583	127	1047.9519	172	1502.9177	37	211.7644	82	557.9168	127	1100.3748	172	1601.0465
38	212.2798	83	548.5234	128	1061.0235	173	1505.8860	38	218.0637	83	567.6410	128	1114.5509	173	1604.3630

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

395 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
39	218.3792	84	557.9598	129	1073.6567	174	1508.8642
40	224.5403	85	567.1322	130	1086.8734	175	1511.2539
41	230.7655	86	576.6206	131	1099.9849	176	1513.0504
42	237.0570	87	586.2865	132	1112.6143	177	1514.8504
43	243.3393	88	595.9803	133	1125.4704	178	1516.0525
44	249.6911	89	605.8577	134	1138.5597	179	1516.6541
45	256.0351	90	615.7634	135	1151.1205	180	1517.2561

400 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
39	224.3504	84	577.5505	129	1128.2630	174	1607.6911
40	230.7025	85	587.1885	130	1142.6206	175	1610.3621
41	237.1223	86	597.1642	131	1156.8762	176	1612.3702
42	243.6124	87	607.3326	132	1170.6193	177	1614.3827
43	250.0948	88	617.5366	133	1184.6209	178	1615.7267
44	256.6508	89	627.9401	134	1198.8885	179	1616.3994
45	263.2007	90	638.3799	135	1212.5916	180	1617.0726

405 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	5.5855	46	273.9961	91	664.5333	136	1278.0997
2	11.1725	47	280.8386	92	675.6672	137	1293.0071
3	16.8270	48	287.7676	93	686.8434	138	1307.7187
4	22.4221	49	294.6978	94	698.2504	139	1322.7036
5	28.0236	50	301.8076	95	709.7002	140	1337.4730
6	33.6332	51	308.9226	96	721.3892	141	1352.5133
7	39.2523	52	316.1343	97	733.3257	142	1367.3171
8	44.8827	53	323.3528	98	745.1010	143	1381.8644
9	50.5910	54	330.6723	99	757.1239	144	1396.1347
10	56.2490	55	338.0003	100	769.1854	145	1410.6497
11	61.8580	56	345.5307	101	781.5031	146	1424.8643
12	67.5499	57	353.0742	102	793.8588	147	1438.7574
13	73.2614	58	360.6300	103	806.4791	148	1452.3077
14	78.9283	59	368.2992	104	819.1366	149	1466.0717
15	84.6839	60	376.0857	105	831.8256	150	1479.4675
16	90.4642	61	383.8885	106	844.7872	151	1492.4734
17	96.2042	62	391.8135	107	857.7784	152	1505.0676
18	101.9720	63	399.7565	108	871.0509	153	1518.4540
19	107.7691	64	407.9365	109	884.3507	154	1530.1767
20	113.5976	65	416.1398	110	897.6711	155	1542.6819
21	119.4592	66	424.3653	111	911.2797	156	1554.0846
22	130.3207	67	432.7276	112	924.9055	157	1565.6304
23	131.2200	68	441.2313	113	938.5407	158	1576.6686
24	137.1917	69	449.7617	114	952.4701	159	1587.1785
25	143.1341	70	458.3176	115	966.7040	160	1597.8077
26	149.1890	71	467.1452	116	980.6405	161	1607.2078
27	155.1463	72	475.8782	117	994.8764	162	1616.7023
28	161.2201	73	484.8931	118	1009.4219	163	1626.2927
29	167.2695	74	493.9412	119	1023.6347	164	1634.5904
30	173.4406	75	503.1537	120	1038.1506	165	1642.9607
31	179.5904	76	512.2658	121	1052.6392	166	1650.6979
32	185.7933	77	521.6817	122	1067.4371	167	1658.4976
33	192.0516	78	531.1341	123	1082.1995	168	1664.9262
34	198.3675	79	540.6212	124	1096.9146	169	1671.3976
35	204.6671	80	550.4323	125	1111.9400	170	1677.1861
36	211.0276	81	560.1365	126	1126.9080	171	1682.2794
37	217.4513	82	570.0260	127	1141.8054	172	1687.3992
38	223.9407	83	580.1071	128	1157.0124	173	1691.0727
39	230.4190	84	590.3866	129	1171.7348	174	1694.7599
40	236.9663	85	600.3901	130	1187.1641	175	1697.7196
41	243.5853	86	610.7505	131	1202.4979	176	1699.9452
42	250.2786	87	621.3174	132	1217.2937	177	1702.1758
43	256.9660	88	631.9278	133	1232.3812	178	1703.6657
44	263.7313	89	642.7526	134	1247.7693	179	1704.4114
45	270.4924	90	653.6221	135	1262.5619	180	1705.1578

410 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	5.7242	46	285.0643	91	697.6945	136	1366.0706
2	11.4501	47	292.2188	92	709.5972	137	1382.6336
3	17.2453	48	299.4659	93	721.5532	138	1398.9945
4	22.9796	49	306.7168	94	733.7645	139	1415.6752
5	28.7207	50	314.1582	95	746.0303	140	1432.1315
6	34.4702	51	321.6076	96	758.5611	141	1448.9056
7	40.2298	52	329.1609	97	771.3666	142	1465.4318
8	46.0013	53	336.7242	98	784.0083	143	1481.6867
9	51.8529	54	344.3961	99	796.9253	144	1497.6469
10	57.6533	55	352.0798	100	809.8935	145	1513.8957
11	63.4039	56	359.9788	101	823.1470	146	1529.8229
12	69.2400	57	367.8946	102	836.4515	147	1545.4038
13	75.0967	58	375.8265	103	850.0516	148	1560.6137
14	80.9080	59	383.8807	104	863.7024	149	1576.0769
15	86.8110	60	392.0615	105	877.3979	150	1591.1397
16	92.7401	61	400.2629	106	891.3987	151	1605.7764
17	98.6284	62	408.5962	107	905.4430	152	1619.9615
18	104.5459	63	416.9522	108	919.8029	153	1635.0513
19	110.4943	64	425.5613	109	934.2045	154	1648.2764
20	116.4756	65	434.1987	110	948.6402	155	1662.3954
21	122.4918	66	442.8636	111	963.4007	156	1675.2795
22	133.6421	67	451.6766	112	978.1925	157	1688.3348
23	134.5655	68	460.6430	113	993.0070	158	1700.8253
24	140.6976	69	469.6418	114	1008.1543	159	1712.7261
25	146.8007	70	478.6720	115	1023.6464	160	1724.7704
26	153.0203	71	487.9934	116	1038.8282	161	1735.4287
27	159.1408	72	497.2197	117	1054.3499	162	1746.2007
28	165.3822	73	506.7487	118	1070.2235	163	1757.0881
29	171.5997	74	516.3177	119	1085.7480	164	1766.5136
30	177.9437	75	526.0658	120	1101.6179	165	1776.0264
31	184.2670	76	535.7129	121	1117.4725	166	1784.8245
32	190.6464	77	545.6869	122	1133.6805	167	1793.6980
33	197.0841	78	555.7052	123	1149.8647	168	1801.0149
34	203.5827	79	565.7658	124	1166.0120	169	1808.3837
35	210.0660	80	576.1760	125	1182.5154	170	1814.9776
36	216.6136	81	586.4788	126	1198.9713	171	1820.7815
37	223.2280	82	596.9844	127	1215.3651	172	1826.6176
38	229.9118	83	607.6999	128	1232.1154	173	1830.8061
39	236.5858	84	618.6329	129	1248.3475	174	1835.0113
40	243.3328	85	629.2789	130	1265.3751	175	1838.3875
41	250.1556	86	640.3114	131	1282.3139	176	1840.9268
42	257.0570	87	651.5709	132	1298.6740	177	1843.4721
43	263.9543	88	662.8841	133	1315.3725	178	1845.1724
44	270.9341	89	674.4333	134	1332.4202	179	1846.0236
45	277.9116	90	686.0378	135	1348.8239	180	1846.8754

415 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	5.8647	46	292.8426	91	723.4588	136	1443.4928
2	11.7312	47	300.2294	92	736.0303	137	1461.7106
3	17.6686	48	307.7144	93	748.6670	138	1479.7242

420 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	6.0069	46	300.7578	91	750.1778	136	1526.9611
2	12.0156	47	308.3830	92	763.4602	137	1547.0498
3	18.0972	48	316.1122	93	776.8213	138	1566.9349

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

415 keV								420 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
4	23.5440	49	315.2057	94	761.5827	139	1498.1087	4	24.1152	49	323.8506	94	790.4875	139	1587.2517
5	29.4264	50	322.8966	95	774.5655	140	1516.2644	5	30.1406	50	331.7980	95	804.2348	140	1607.3378
6	35.3176	51	330.5985	96	787.8384	141	1534.7897	6	36.1753	51	339.7597	96	818.3002	141	1627.8554
7	41.2195	52	338.4107	97	801.4125	142	1553.0598	7	42.2212	52	347.8384	97	832.6959	142	1648.1129
8	47.1337	53	346.2361	98	814.8232	143	1571.0483	8	48.2801	53	355.9338	98	846.9294	143	1668.0799
9	53.1305	54	354.1769	99	828.5363	144	1588.7283	9	54.4238	54	364.1516	99	861.4954	144	1687.7256
10	59.0752	55	362.1329	100	842.3143	145	1606.7458	10	60.5147	55	372.3884	100	876.1420	145	1707.7680
11	64.9692	56	370.3151	101	856.4065	146	1624.4243	11	66.5540	56	380.8628	101	891.1348	146	1727.4544
12	70.9514	57	378.5179	102	870.5642	147	1641.7353	12	72.6841	57	389.3619	102	906.2097	147	1746.7521
13	76.9552	58	386.7408	103	885.0480	148	1658.6501	13	78.8370	58	397.8855	103	921.6448	148	1765.6277
14	82.9131	59	395.0939	104	899.5976	149	1675.8631	14	84.9434	59	406.5476	104	937.1632	149	1784.8558
15	88.9655	60	403.5818	105	914.2069	150	1692.6460	15	91.1473	60	415.3534	105	952.7585	150	1803.6229
16	95.0453	61	412.0949	106	929.1543	151	1708.9693	16	97.3799	61	424.1890	106	968.7286	151	1821.8943
17	101.0840	62	420.7486	107	944.1607	152	1724.8031	17	103.5712	62	433.1746	107	984.7758	152	1839.6350
18	107.1534	63	429.4296	108	959.5175	153	1741.6621	18	109.7946	63	442.1926	108	1001.2124	153	1858.5432
19	113.2553	64	438.3777	109	974.9321	154	1756.4508	19	116.0522	64	451.4924	109	1017.7259	154	1875.1454
20	119.3918	65	447.3594	110	990.3968	155	1772.2523	20	122.3462	65	460.8315	110	1034.3079	155	1892.9011
21	125.5649	66	456.3739	111	1006.2233	156	1786.6839	21	128.6786	66	470.2091	111	1051.2936	156	1909.1323
22	137.0086	67	465.5468	112	1022.0974	157	1801.3192	22	140.4203	67	479.7562	112	1068.3464	157	1925.6072
23	137.9564	68	474.8838	113	1038.0102	158	1815.3323	23	141.3929	68	489.4789	113	1085.4567	158	1941.3955
24	144.2515	69	484.2593	114	1054.2951	159	1828.6941	24	147.8536	69	499.2465	114	1102.9839	159	1956.4625
25	150.5178	70	493.6721	115	1070.9662	160	1842.2269	25	154.2858	70	509.0581	115	1120.9442	160	1971.7348
26	156.9049	71	503.3934	116	1087.3186	161	1854.2111	26	160.8433	71	519.1964	116	1138.5784	161	1985.2699
27	163.1915	72	513.0205	117	1104.0526	162	1866.3310	27	167.2987	72	529.2418	117	1156.6417	162	1998.9685
28	169.6034	73	522.9686	118	1121.1823	163	1878.5892	28	173.8841	73	539.6277	118	1175.1508	163	2012.8335
29	175.9921	74	532.9638	119	1137.9513	164	1889.2080	29	180.4470	74	550.0685	119	1193.2884	164	2024.8527
30	182.5120	75	543.1517	120	1155.1097	165	1899.9316	30	187.1461	75	560.7165	120	1211.8658	165	2036.9984
31	189.0122	76	553.2395	121	1172.2681	166	1909.8551	31	193.8263	76	571.2657	121	1230.4622	166	2048.2450
32	195.5714	77	563.6750	122	1189.8261	167	1919.8692	32	200.5688	77	582.1848	122	1249.5113	167	2059.6012
33	202.1921	78	574.1627	123	1207.3756	168	1928.1309	33	207.3760	78	593.1649	123	1268.5712	168	2068.9753
34	208.8770	79	584.7008	124	1224.9023	169	1936.4548	34	214.2508	79	604.2043	124	1287.6261	169	2078.4249
35	215.5478	80	595.6114	125	1242.8334	170	1943.9067	35	221.1129	80	615.6408	125	1307.1413	170	2086.8885
36	222.2864	81	606.4159	126	1260.7309	171	1950.4684	36	228.0465	81	626.9729	126	1326.6408	171	2094.3442
37	229.0954	82	617.4396	127	1278.5787	172	1957.0688	37	235.0543	82	638.5421	127	1346.1069	172	2101.8471
38	235.9777	83	628.6905	128	1296.8332	173	1961.8074	38	242.1395	83	650.3571	128	1366.0380	173	2107.2354
39	242.8518	84	640.1770	129	1314.5406	174	1966.5661	39	249.2182	84	662.4272	129	1385.3927	174	2112.6481
40	249.8031	85	651.3689	130	1333.1350	175	1970.3876	40	256.3782	85	674.1955	130	1405.7388	175	2116.9960
41	256.8344	86	662.9745	131	1351.6515	176	1973.2623	41	263.6229	86	686.4065	131	1426.0222	176	2120.2673
42	263.9488	87	674.8265	132	1369.5537	177	1976.1443	42	270.9553	87	698.8852	132	1445.6542	177	2123.5476
43	271.0611	88	686.7429	133	1387.8446	178	1978.0698	43	278.2878	88	711.4402	133	1465.7342	178	2125.7394
44	278.2606	89	698.9160	134	1406.5375	179	1979.0337	44	285.7125	89	724.2745	134	1486.2782	179	2126.8368
45	285.4600	90	711.1557	135	1424.5427	180	1979.9985	45	293.1394	90	737.1881	135	1506.0883	180	2127.9352

425 keV								430 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	6.1508	46	308.8117	91	777.8993	136	1617.1925	1	6.2963	46	317.0063	91	806.6748	136	1715.0221
2	12.3035	47	316.6817	92	791.9382	137	1639.4051	2	12.5947	47	325.1275	92	821.5190	137	1739.6570
3	18.5308	48	324.6617	93	806.0707	138	1661.4186	3	18.9696	48	333.3651	93	836.4740	138	1764.1022
4	24.6933	49	332.6540	94	820.5371	139	1683.9366	4	25.2782	49	341.6183	94	851.7943	139	1789.1396
5	30.8635	50	340.8651	95	835.1006	140	1706.2254	5	31.5949	50	350.1006	95	867.2298	140	1813.9542
6	37.0434	51	349.0940	96	850.0128	141	1729.0203	6	37.9219	51	358.6044	96	883.0479	141	1839.3653
7	43.2351	52	357.4470	97	865.2875	142	1751.5532	7	44.2610	52	367.2397	97	899.2640	142	1864.5174
8	49.4404	53	365.8204	98	880.4024	143	1773.7895	8	50.6145	53	375.8995	98	915.3240	143	1889.3703
9	55.7329	54	374.3238	99	895.8831	144	1795.6936	9	57.0578	54	384.6972	99	931.7867	144	1913.8832
10	61.9718	55	382.8502	100	911.4625	145	1818.0661	10	63.4464	55	393.5223	100	948.3687	145	1938.9524
11	68.1582	56	391.6261	101	927.4234	146	1840.0671	11	69.7819	56	402.6093	101	965.3718	146	1963.6371
12	74.4383	57	400.4313	102	943.4856	147	1861.6586	12	76.2138	57	411.7306	102	982.4980	147	1987.8929
13	80.7421	58	409.2655	103	959.9459	148	1882.8016	13	82.6706	58	420.8858	103	1000.0647	148	2011.6743
14	86.9989	59	418.2471	104	976.5098	149	1904.3639	14	89.0799	59	430.1979	104	1017.7582	149	2035.9573
15	93.3564	60	427.3817	105	993.1705	150	1925.4329	15	95.5929	60	439.6727	105	1035.5718	150	2059.7142
16	99.7440	61	436.5513	106	1010.2471	151	1945.9680	16	102.1375	61	449.1882	106	1053.8473	151	2082.8970
17	106.0899	62	445.8808	107	1027.4220	152	1965.9280	17	108.6403	62	458.8740	107	1072.2456	152	2105.4572

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

425 keV								430 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
18	112.4696	63	455.2483	108	1045.0299	153	1987.2246	18	115.1784	63	468.6039	108	1091.1264	153	2129.5569
19	118.8852	64	464.9129	109	1062.7370	154	2005.9437	19	121.7542	64	478.6472	109	1110.1323	154	2150.7645
20	125.3389	65	474.6231	110	1080.5346	155	2025.9838	20	128.3701	65	488.7428	110	1129.2545	155	2173.4945
21	131.8331	66	484.3781	111	1098.7831	156	2044.3219	21	135.0284	66	498.8900	111	1148.8810	156	2194.3173
22	143.8773	67	494.3143	112	1117.1216	157	2062.9534	22	147.3798	67	509.2309	112	1168.6247	157	2215.4959
23	144.8751	68	504.4384	113	1135.5402	158	2080.8255	23	148.4032	68	519.7727	113	1188.4752	158	2235.8331
24	151.5040	69	514.6145	114	1154.4264	159	2097.8969	24	155.2030	69	530.3744	114	1208.8512	159	2255.2787
25	158.1048	70	524.8416	115	1173.7992	160	2115.2165	25	161.9752	70	541.0347	115	1229.7747	160	2275.0271
26	164.8354	71	535.4149	116	1192.8397	161	2130.5792	26	168.8818	71	552.0621	116	1250.3617	161	2292.5609
27	171.4626	72	545.8970	117	1212.3638	162	2146.1401	27	175.6835	72	563.0002	117	1271.4947	162	2310.3369
28	178.2245	73	556.7403	118	1232.3910	163	2161.9031	28	182.6250	73	574.3216	118	1293.1965	163	2328.3602
29	184.9647	74	567.6471	119	1252.0371	164	2175.5781	29	189.5456	74	585.7157	119	1314.5093	164	2344.0096
30	191.8462	75	578.7766	120	1272.1810	165	2189.4070	30	196.6129	75	597.3494	120	1336.3870	165	2359.8480
31	198.7099	76	589.8093	121	1292.3673	166	2202.2211	31	203.6633	76	608.8886	121	1358.3358	166	2374.5354
32	205.6390	77	601.2354	122	1313.0677	167	2215.1689	32	210.7827	77	620.8464	122	1380.8697	167	2389.3873
33	212.6364	78	612.7322	123	1333.8027	168	2225.8635	33	217.9739	78	632.8857	123	1403.4680	168	2401.6632
34	219.7050	79	624.2980	124	1354.5554	169	2236.6502	34	225.2400	79	645.0047	124	1426.1123	169	2414.0525
35	226.7622	80	636.2872	125	1375.8333	170	2246.3166	35	232.4963	80	657.5752	125	1449.3575	170	2425.1619
36	233.8947	81	648.1745	126	1397.1183	171	2254.8359	36	239.8319	81	670.0470	126	1472.6386	171	2434.9581
37	241.1056	82	660.3182	127	1418.3909	172	2263.4130	37	247.2501	82	682.7959	127	1495.9346	172	2444.8256
38	248.3980	83	672.7279	128	1440.1968	173	2269.5750	38	254.7542	83	695.8328	128	1519.8439	173	2451.9179
39	255.6857	84	685.4139	129	1461.3964	174	2275.7671	39	262.2556	84	709.1691	129	1543.1171	174	2459.0472
40	263.0594	85	697.7908	130	1483.7078	175	2280.7425	40	269.8476	85	722.1893	130	1567.6413	175	2464.7776
41	270.5223	86	710.6421	131	1505.9770	176	2284.4867	41	277.5339	86	735.7178	131	1592.1504	176	2469.0912
42	278.0779	87	723.7840	132	1527.5561	177	2288.2420	42	285.3179	87	749.5622	132	1615.9299	177	2473.4183
43	285.6359	88	737.0156	133	1549.6535	178	2290.7516	43	293.1069	88	763.5109	133	1640.3110	178	2476.3107
44	293.2913	89	750.5511	134	1572.2884	179	2292.0082	44	300.9987	89	777.7906	134	1665.3172	179	2477.7592
45	300.9515	90	764.1801	135	1594.1405	180	2293.2661	45	308.8981	90	792.1796	135	1689.4896	180	2479.2091

435 keV								440 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	6.4436	46	325.3437	91	836.5593	136	1821.4291	1	6.5926	46	333.8258	91	867.6118	136	1937.5689
2	12.8894	47	333.7227	92	852.2618	137	1848.8399	2	13.1875	47	342.4694	92	884.2296	137	1968.1780
3	19.4136	48	342.2248	93	868.0941	138	1876.0773	3	19.8626	48	351.2432	93	900.9988	138	1998.6394
4	25.8700	49	350.7461	94	884.3265	139	1904.0136	4	26.4687	49	360.0401	94	918.2064	139	2029.9299
5	32.3350	50	359.5072	95	900.6946	140	1931.7402	5	33.0837	50	369.0878	95	935.5729	140	2061.0334
6	38.8107	51	368.2938	96	917.4826	141	1960.1736	6	39.7098	51	378.1654	96	953.4005	141	2092.9795
7	45.2992	52	377.2198	97	934.7080	142	1988.3573	7	46.3494	52	387.3907	97	971.7092	142	2124.6946
8	51.8027	53	386.1746	98	951.7826	143	2016.2454	8	53.0047	53	396.6495	98	989.8741	143	2156.1258
9	58.3984	54	395.2757	99	969.3008	144	2043.7903	9	59.7548	54	406.0633	99	1008.5282	144	2187.2179
10	64.9387	55	404.4089	100	986.9618	145	2071.9999	10	66.4487	55	415.5142	100	1027.3520	145	2219.1098
11	71.4251	56	413.8171	101	1005.0880	146	2099.8160	11	73.0879	56	425.2539	101	1046.6901	146	2250.6057
12	78.0107	57	423.2648	102	1023.3625	147	2127.1868	12	79.8291	57	435.0388	102	1066.2054	147	2281.6449
13	84.6225	58	432.7518	103	1042.1247	148	2154.0589	13	86.5978	58	444.8687	103	1086.2613	148	2312.1646
14	91.1862	59	442.4056	104	1061.0406	149	2181.5353	14	93.3179	59	454.8760	104	1106.5021	149	2343.4179
15	97.8568	60	452.2325	105	1080.1035	150	2208.4531	15	100.1483	60	465.0674	105	1126.9208	150	2374.0823
16	104.5606	61	462.1062	106	1099.6801	151	2234.7555	16	107.0134	61	475.3121	106	1147.9116	151	2404.0901
17	111.2223	62	472.1614	107	1119.4081	152	2260.3849	17	113.8362	62	485.7502	107	1169.0870	152	2433.3724
18	117.9211	63	482.2671	108	1139.6741	153	2287.7997	18	120.6979	63	496.2457	108	1190.8634	153	2464.7411
19	124.6595	64	492.7034	109	1160.0957	154	2311.9557	19	127.6011	64	507.0901	109	1212.8310	154	2492.4208
20	131.4399	65	503.1994	110	1180.6639	155	2337.8782	20	134.5483	65	518.0020	110	1234.9808	155	2522.1663
21	138.2647	66	513.7543	111	1201.7971	156	2361.6551	21	141.5421	66	528.9809	111	1257.7646	156	2549.4878
22	150.9279	67	524.5163	112	1223.0796	157	2385.8674	22	154.5220	67	540.1810	112	1280.7356	157	2577.3471
23	151.9774	68	535.4931	113	1244.5006	158	2409.1454	23	155.5979	68	551.6108	113	1303.8829	158	2604.1668
24	158.9507	69	546.5381	114	1266.5131	159	2431.4282	24	162.7474	69	563.1180	114	1327.6972	159	2629.8729
25	165.8970	70	557.6503	115	1289.1430	160	2454.0833	25	169.8706	70	574.7016	115	1352.2091	160	2656.0414
26	172.9826	71	569.1514	116	1311.4345	161	2474.2194	26	177.1380	71	586.6973	116	1376.3840	161	2679.3281
27	179.9619	72	580.5659	117	1334.3437	162	2494.6542	27	184.2978	72	598.6096	117	1401.2591	162	2702.9874
28	187.0860	73	592.3871	118	1357.8975	163	2515.3946	28	191.6077	73	610.9535	118	1426.8664	163	2727.0282
29	194.1901	74	604.2913	119	1381.0567	164	2533.4207	29	198.8986	74	623.3916	119	1452.0767	164	2747.9455
30	201.4464	75	616.4530	120	1404.8583	165	2551.6808	30	206.3474	75	636.1065	120	1478.0193	165	2769.1562
31	208.6872	76	628.5232	121	1428.7663	166	2568.6290	31	213.7818	76	648.7336	121	1504.1118	166	2788.8623

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

435 keV								440 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
32	216.0003	77	641.0390	122	1453.3421	167	2585.7814	32	221.2924	77	661.8350	122	1530.9686	167	2808.8251
33	223.3890	78	653.6479	123	1478.0191	168	2599.9698	33	228.8824	78	675.0424	123	1557.9721	168	2825.3528
34	230.8566	79	666.3483	124	1502.7775	169	2614.2995	34	236.5554	79	688.3543	124	1585.1013	169	2842.0587
35	238.3159	80	679.5306	125	1528.2255	170	2627.1575	35	244.2219	80	702.1805	125	1613.0243	170	2857.0601
36	245.8588	81	692.6178	126	1553.7459	171	2638.5024	36	251.9763	81	715.9164	126	1641.0659	171	2870.3054
37	253.4887	82	706.0049	127	1579.3159	172	2649.9363	37	259.8223	82	729.9766	127	1669.2011	172	2883.6632
38	261.2090	83	719.7037	128	1605.5938	173	2658.1585	38	267.7636	83	744.3743	128	1698.1563	173	2893.2742
39	268.9288	84	733.7269	129	1631.2062	174	2666.4271	39	275.7066	84	759.1236	129	1726.4184	174	2902.9438
40	276.7442	85	747.4274	130	1658.2316	175	2673.0756	40	283.7503	85	773.5438	130	1756.2828	175	2910.7222
41	284.6589	86	761.6728	131	1685.2774	176	2678.0817	41	291.8987	86	788.5486	131	1786.2140	176	2916.5810
42	292.6768	87	776.2614	132	1711.5537	177	2683.1049	42	300.1560	87	803.9265	132	1815.3362	177	2922.4614
43	300.7022	88	790.9710	133	1738.5312	178	2686.4631	43	308.4236	88	819.4438	133	1845.2793	178	2926.3937
44	308.8364	89	806.0410	134	1766.2389	179	2688.1451	44	316.8060	89	835.3538	134	1876.0792	179	2928.3635
45	316.9809	90	821.2381	135	1793.0596	180	2689.8291	45	325.2019	90	851.4107	135	1905.9379	180	2930.3357

445 keV								450 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	6.7433	46	342.4548	91	899.8956	136	2064.8147	1	6.8957	46	351.2327	91	933.4789	136	2204.8115
2	13.4889	47	351.3700	92	917.4906	137	2099.1303	2	13.7938	47	360.4268	92	952.1181	137	2243.4497
3	20.3169	48	360.4229	93	935.2613	138	2133.3365	3	20.7762	48	369.7662	93	970.9602	138	2282.0348
4	27.0742	49	369.5028	94	953.5125	139	2168.5326	4	27.6866	49	379.1372	94	990.3296	139	2321.8097
5	33.8409	50	378.8453	95	971.9489	140	2203.5775	5	34.6068	50	388.7829	95	1009.9137	140	2361.4876
6	40.6193	51	388.2224	96	990.8920	141	2239.6332	6	41.5392	51	398.4681	96	1030.0552	141	2402.3871
7	47.4118	52	397.7558	97	1010.3647	142	2275.4902	7	48.4863	52	408.3187	97	1050.7801	142	2443.1391
8	54.2207	53	407.3277	98	1029.7029	143	2311.0872	8	55.4506	53	418.2133	98	1071.3822	143	2483.6725
9	61.1270	54	417.0640	99	1049.5808	144	2346.3600	9	62.5150	54	428.2820	99	1092.5806	144	2523.9127
10	67.9763	55	426.8428	100	1069.6593	145	2382.6021	10	69.5215	55	438.3990	100	1114.0147	145	2565.3377
11	74.7701	56	436.9247	101	1090.3069	146	2418.4561	11	76.4719	56	448.8342	101	1136.0793	146	2606.3980
12	81.6690	57	447.0579	102	1111.1648	147	2453.8504	12	83.5303	57	459.3273	102	1158.3925	147	2647.0091
13	88.5965	58	457.2423	103	1132.6230	148	2488.7108	13	90.6187	58	469.8782	103	1181.3726	148	2687.0829
14	95.4751	59	467.6152	104	1154.3017	149	2524.4693	14	97.6578	59	480.6294	104	1204.6147	149	2728.2669
15	102.4673	60	478.1839	105	1176.1944	150	2559.6134	15	104.8138	60	491.5889	105	1228.1125	150	2768.8203
16	109.4958	61	488.8131	106	1198.7249	151	2594.0622	16	112.0080	61	502.6164	106	1252.3225	151	2808.6455
17	116.4819	62	499.6481	107	1221.4788	152	2627.7326	17	119.1595	62	513.8630	107	1276.8011	152	2847.6422
18	123.5088	63	510.5482	108	1244.9050	153	2663.8620	18	126.3538	63	525.1828	108	1302.0330	153	2889.5654
19	130.5791	64	521.8162	109	1268.5642	154	2695.7943	19	133.5936	64	536.8909	109	1327.5467	154	2926.6864
20	137.6955	65	533.1604	110	1292.4473	155	2730.1637	20	140.8816	65	548.6843	110	1353.3336	155	2966.7120
21	144.8608	66	544.5801	111	1317.0432	156	2761.7819	21	148.2209	66	560.5627	111	1379.9234	156	3003.5990
22	158.1620	67	556.2362	112	1341.8713	157	2794.0713	22	161.8482	67	572.6936	112	1406.7986	157	3041.3340
23	159.2647	68	568.1380	113	1366.9203	158	2825.2026	23	162.9782	68	585.0871	113	1433.9479	158	3077.7781
24	166.5933	69	580.1269	114	1392.7234	159	2855.0844	24	170.4886	69	597.5785	114	1461.9514	159	3112.8172
25	173.8962	70	592.2024	115	1419.3162	160	2885.5473	25	177.9741	70	610.1672	115	1490.8512	160	3148.5958
26	181.3484	71	604.7147	116	1445.5773	161	2912.6924	26	185.6140	71	623.2192	116	1519.4297	161	3180.5276
27	188.6917	72	617.1473	117	1472.6342	162	2940.3074	27	193.1439	72	636.1958	117	1548.9152	162	3213.0604
28	196.1905	73	630.0381	118	1500.5250	163	2968.4049	28	200.8348	73	649.6591	118	1579.3527	163	3246.2115
29	203.6715	74	643.0353	119	1528.0204	164	2992.8821	29	208.5091	74	663.2419	119	1609.4022	164	3275.1324
30	211.3161	75	656.3300	120	1556.3531	165	3017.7314	30	216.3531	75	677.1446	120	1640.4117	165	3304.5324
31	218.9478	76	669.5413	121	1584.8890	166	3040.8443	31	224.1856	76	690.9690	121	1671.6900	166	3331.9135
32	226.6595	77	683.2577	122	1614.3022	167	3064.2840	32	232.1022	77	705.3315	122	1703.9787	167	3359.7170
33	234.4547	78	697.0941	123	1643.9187	168	3083.7098	33	240.1065	78	719.8295	123	1736.5407	168	3382.7863
34	242.3371	79	711.0495	124	1673.7161	169	3103.3631	34	248.2023	79	734.4622	124	1769.3525	169	3406.1504
35	250.2149	80	725.5539	125	1704.4304	170	3121.0269	35	256.2957	80	749.6812	125	1803.2277	170	3427.1708
36	258.1852	81	739.9736	126	1735.3214	171	3136.6349	36	264.4862	81	764.8223	126	1837.3528	171	3445.7616
37	266.2518	82	754.7441	127	1766.3623	172	3152.3872	37	272.7781	82	780.3430	127	1871.6991	172	3464.5403
38	274.4187	83	769.8803	128	1798.3567	173	3163.7282	38	281.1756	83	796.2597	128	1907.1591	173	3478.0702
39	282.5899	84	785.3975	129	1829.6331	174	3175.1446	39	289.5799	84	812.5896	129	1941.8811	174	3491.6985
40	290.8670	85	800.5799	130	1862.7344	175	3184.3325	40	298.0958	85	828.5795	130	1978.6911	175	3502.6726
41	299.2546	86	816.3895	131	1895.9631	176	3191.2556	41	306.7280	86	845.2429	131	2015.7074	176	3510.9453
42	307.7569	87	832.6050	132	1928.3450	177	3198.2065	42	315.4810	87	862.3478	132	2051.8427	177	3519.2544
43	316.2726	88	848.9805	133	1961.6926	178	3202.8560	43	324.2509	88	879.6357	133	2089.1204	178	3524.8141
44	324.9094	89	865.7839	134	1996.0506	179	3205.1854	44	333.1484	89	897.3902	134	2127.5961	179	3527.6001
45	333.5631	90	882.7564	135	2029.4132	180	3207.5179	45	342.0663	90	915.3386	135	2165.0239	180	3530.3901

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

455 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	7.0498	46	360.1619	91	968.4352	136	2359.5464
2	14.1022	47	369.6422	92	988.1912	137	2403.2617
3	21.2407	48	379.2760	93	1008.1809	138	2447.0046
4	28.3059	49	388.9461	94	1028.7494	139	2492.1883
5	35.3813	50	398.9035	95	1049.5662	140	2537.3551
6	42.4694	51	408.9058	96	1070.9967	141	2584.0104
7	49.5730	52	419.0831	97	1093.0703	142	2630.5964
8	56.6945	53	429.3102	98	1115.0359	143	2677.0311
9	63.9188	54	439.7216	99	1137.6608	144	2723.2275
10	71.0844	55	450.1877	100	1160.5617	145	2770.8856
11	78.1932	56	460.9877	101	1184.1620	146	2818.2264
12	85.4131	57	471.8527	102	1208.0548	147	2865.1496
13	92.6644	58	482.7825	103	1232.6897	148	2911.5503
14	99.8660	59	493.9253	104	1257.6345	149	2959.3384
15	107.1880	60	505.2893	105	1282.8833	150	3006.4960
16	114.5499	61	516.7296	106	1308.9288	151	3052.9051
17	121.8692	62	528.4030	107	1335.2955	152	3098.4433
18	129.2331	63	540.1586	108	1362.5077	153	3147.5035
19	136.6447	64	552.3238	109	1390.0593	154	3191.0348
20	144.1068	65	564.5843	110	1417.9418	155	3238.0682
21	151.6225	66	576.9399	111	1446.7308	156	3281.5019
22	165.5809	67	589.5652	112	1475.8681	157	3326.0220
23	166.7385	68	602.4711	113	1505.3431	158	3369.1039
24	174.4335	69	615.4867	114	1535.7879	159	3410.6034
25	182.1044	70	628.6114	115	1567.2526	160	3453.0588
26	189.9351	71	642.2273	116	1598.4131	161	3491.0178
27	197.6546	72	655.7730	117	1630.6099	162	3529.7577
28	205.5409	73	669.8355	118	1663.8972	163	3569.3030
29	213.4120	74	684.0321	119	1696.8107	164	3603.8594
30	221.4588	75	698.5725	120	1730.8288	165	3639.0430
31	229.4958	76	713.0407	121	1765.1964	166	3671.8604
32	237.6210	77	728.0822	122	1800.7319	167	3705.2331
33	245.8383	78	743.2763	123	1836.6277	168	3732.9611
34	254.1519	79	758.6223	124	1872.8595	169	3761.0784
35	262.4650	80	774.5949	125	1910.3296	170	3786.4052
36	270.8804	81	790.4973	126	1948.1419	171	3808.8286
37	279.4023	82	806.8106	127	1986.2664	172	3831.5012
38	288.0352	83	823.5530	128	2025.6978	173	3847.8508
39	296.6777	84	840.7437	129	2064.3783	174	3864.3314
40	305.4378	85	857.5897	130	2105.4606	175	3877.6111
41	314.3202	86	875.1594	131	2146.8518	176	3887.6270
42	323.3300	87	893.2095	132	2187.3343	177	3897.6914
43	332.3601	88	911.4682	133	2229.1758	178	3904.4281
44	341.5247	89	930.2360	134	2272.4468	179	3907.8046
45	350.7135	90	949.2256	135	2314.6222	180	3911.1866

460 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	7.2056	46	369.2445	91	1004.8436	136	2531.4428
2	14.4139	47	379.0187	92	1025.7953	137	2581.1680
3	21.7104	48	388.9549	93	1047.0153	138	2631.0355
4	28.9320	49	398.9323	94	1068.8715	139	2682.6626
5	36.1644	50	409.2104	95	1091.0136	140	2734.3895
6	43.4100	51	419.5391	96	1113.8322	141	2787.9468
7	50.6718	52	430.0528	97	1137.3606	142	2841.5525
8	57.9523	53	440.6225	98	1160.7989	143	2895.1115
9	65.3384	54	451.3874	99	1184.9672	144	2948.5224
10	72.6650	55	462.2136	100	1209.4578	145	3003.7564
11	79.9341	56	473.3904	101	1234.7250	146	3058.7569
12	87.3175	57	484.6397	102	1260.3352	147	3113.4049
13	94.7337	58	495.9615	103	1286.7726	148	3167.5744
14	102.0997	59	507.5094	104	1313.5750	149	3223.4996
15	109.5899	60	519.2925	105	1340.7378	150	3278.8226
16	117.1217	61	531.1606	106	1368.7931	151	3333.3994
17	124.6109	62	543.2769	107	1397.2312	152	3387.0798
18	132.1468	63	555.4848	108	1426.6202	153	3445.0541
19	139.7325	64	568.1249	109	1456.4159	154	3496.6188
20	147.3711	65	580.8711	110	1486.6111	155	3552.4633
21	155.0659	66	593.7233	111	1517.8317	156	3604.1554
22	169.3601	67	606.8636	112	1549.4755	157	3657.2622
23	170.5457	68	620.3038	113	1581.5326	158	3708.7709
24	178.4281	69	633.8663	114	1614.6939	159	3758.4976
25	186.2874	70	647.5508	115	1649.0190	160	3809.4815
26	194.3120	71	661.7563	116	1683.0651	161	3855.1618
27	202.2243	72	675.8974	117	1718.2993	162	3901.8758
28	210.3092	73	690.5875	118	1754.7864	163	3949.6590
29	218.3803	74	705.4275	119	1790.9234	164	3991.4954
30	226.6336	75	720.6371	120	1828.3358	165	4034.1693
31	234.8788	76	735.7816	121	1866.1973	166	4074.0445
32	243.2165	77	751.5372	122	1905.4140	167	4114.6653
33	251.6510	78	767.4640	123	1945.0994	168	4148.4698
34	260.1864	79	783.5617	124	1985.2289	169	4182.7995
35	268.7238	80	800.3291	125	2026.8067	170	4213.7658
36	277.3685	81	817.0355	126	2068.8438	171	4241.2168
37	286.1253	82	834.1869	127	2111.3091	172	4269.0060
38	294.9987	83	851.8033	128	2155.3160	173	4289.0660
39	303.8847	84	869.9061	129	2198.5701	174	4309.3042
40	312.8943	85	887.6605	130	2244.6025	175	4325.6246
41	322.0328	86	906.1929	131	2291.0779	176	4337.9415
42	331.3054	87	925.2484	132	2336.6274	177	4350.3246
43	340.6019	88	944.5411	133	2383.8042	178	4358.6170
44	350.0403	89	964.3893	134	2432.6982	179	4362.7744
45	359.5070	90	984.4905	135	2480.4577	180	4366.9393

465 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	7.3631	46	378.4830	91	1042.7895	136	2723.4869
2	14.7290	47	388.5587	92	1065.0228	137	2780.3880
3	22.1852	48	398.8056	93	1087.5635	138	2837.5943
4	29.5651	49	409.0990	94	1110.8037	139	2896.9698
5	36.9561	50	419.7069	95	1134.3729	140	2956.6147
6	44.3610	51	430.3714	96	1158.6882	141	3018.5335
7	51.7827	52	441.2317	97	1183.7876	142	3080.6753
8	59.2241	53	452.1545	98	1208.8192	143	3142.9310
9	66.7739	54	463.2840	99	1234.6599	144	3205.1821
10	74.2634	55	474.4819	100	1260.8758	145	3269.7349
11	81.6946	56	486.0478	101	1287.9554	146	3334.1942
12	89.2434	57	497.6942	102	1315.4363	147	3398.4184
13	96.8265	58	509.4214	103	1343.8403	148	3462.2563
14	104.3591	59	521.3887	104	1372.6736	149	3528.3475

470 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	7.5223	46	387.8796	91	1082.3654	136	2939.4014
2	15.0475	47	398.2650	92	1105.9738	137	3004.9542
3	22.6651	48	408.8310	93	1129.9337	138	3071.0438
4	30.2049	49	419.4492	94	1154.6637	139	3139.8364
5	37.7564	50	430.3964	95	1179.7711	140	3209.1440
6	45.3224	51	441.4066	96	1205.7025	141	3281.3101
7	52.9059	52	452.6239	97	1232.5012	142	3353.9586
8	60.5099	53	463.9106	98	1259.2590	143	3426.9645
9	68.2251	54	475.4161	99	1286.9147	144	3500.1908
10	75.8794	55	486.9977	100	1315.0063	145	3576.3640
11	83.4748	56	498.9655	101	1344.0600	146	3652.6713
12	91.1910	57	511.0225	102	1373.5821	147	3728.9444
13	98.9430	58	523.1691	103	1404.1362	148	3805.0013
14	106.6442	59	535.5705	104	1435.1941	149	3883.9989

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

465 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
15	112.0195	60	533.6059	105	1401.9326	150	3593.9123
16	119.7234	61	545.9176	106	1432.1934	151	3658.7741
17	127.3847	62	558.4933	107	1462.9091	152	3722.7468
18	135.0949	63	571.1710	108	1494.6962	153	3792.0341
19	142.8571	64	584.3046	109	1526.9695	154	3853.8338
20	150.6747	65	597.5559	110	1559.7232	155	3920.9471
21	158.5510	66	610.9252	111	1593.6397	156	3983.2416
22	173.1860	67	624.6020	112	1628.0685	157	4047.4134
23	174.4002	68	638.5995	113	1663.0011	158	4109.8218
24	182.4729	69	652.7328	114	1699.1944	159	4170.2284
25	190.5234	70	667.0021	115	1736.7196	160	4232.3232
26	198.7449	71	681.8241	116	1774.0021	161	4288.0974
27	206.8532	72	696.5884	117	1812.6508	162	4345.2702
28	215.1401	73	711.9361	118	1852.7441	163	4403.8948
29	223.4147	74	727.4509	119	1892.5234	164	4455.3426
30	231.8781	75	743.3632	120	1933.7809	165	4507.9354
31	240.3352	76	759.2184	121	1975.6108	166	4557.1845
32	248.8894	77	775.7252	122	2019.0201	167	4607.4594
33	257.5450	78	792.4237	123	2063.0334	168	4649.3792
34	266.3067	79	809.3139	124	2107.6267	169	4692.0259
35	275.0727	80	826.9202	125	2153.9226	170	4730.5598
36	283.9515	81	844.4763	126	2200.8265	171	4764.7714
37	292.9480	82	862.5143	127	2248.3070	172	4799.4546
38	302.0671	83	881.0565	128	2297.6166	173	4824.5224
39	311.2019	84	900.1266	129	2346.1873	174	4849.8395
40	320.4668	85	918.8454	130	2397.9923	175	4870.2751
41	329.8672	86	938.4013	131	2450.4159	176	4885.7093
42	339.4087	87	958.5271	132	2501.9127	177	4901.2364
43	348.9782	88	978.9218	133	2555.3723	178	4911.6400
44	358.6971	89	999.9233	134	2610.9104	179	4916.8575
45	368.4487	90	1021.2177	135	2665.2907	180	4922.0855

470 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
15	114.4769	60	548.2375	105	1466.7539	150	3962.6261
16	122.3551	61	561.0091	106	1499.4403	151	4040.6648
17	130.1907	62	574.0616	107	1532.6661	152	4117.8833
18	138.0775	63	587.2270	108	1567.1018	153	4201.7976
19	146.0186	64	600.8737	109	1602.1176	154	4276.8913
20	154.0176	65	614.6506	110	1637.7095	155	4358.7073
21	162.0781	66	628.5582	111	1674.6235	156	4434.8977
22	177.0589	67	642.7942	112	1712.1562	157	4513.6359
23	178.3020	68	657.3729	113	1750.3011	158	4590.4567
24	186.5678	69	672.1023	114	1789.8898	159	4665.0456
25	194.8126	70	686.9828	115	1831.0078	160	4741.9584
26	203.2343	71	702.4497	116	1871.9329	161	4811.2502
27	211.5416	72	717.8667	117	1914.4350	162	4882.4844
28	220.0339	73	733.9036	118	1958.6089	163	4955.7440
29	228.5155	74	750.1264	119	2002.5211	164	5020.2165
30	237.1926	75	766.7767	120	2048.1537	165	5086.2999
31	245.8655	76	783.3792	121	2094.5120	166	5148.3438
32	254.6401	77	800.6767	122	2142.7194	167	5211.8422
33	263.5212	78	818.1883	123	2191.7008	168	5264.9136
34	272.5134	79	835.9146	124	2241.4338	169	5319.0230
35	281.5127	80	854.4070	125	2293.1790	170	5368.0166
36	290.6303	81	872.8615	126	2345.7222	171	5411.5964
37	299.8715	82	891.8381	127	2399.0330	172	5455.8555
38	309.2415	83	911.3615	128	2454.5275	173	5487.8940
39	318.6306	84	931.4581	129	2509.3205	174	5520.2932
40	328.1565	85	951.2018	130	2567.9049	175	5546.4765
41	337.8248	86	971.8467	131	2627.3394	176	5566.2700
42	347.6417	87	993.1128	132	2685.8711	177	5586.1988
43	357.4908	88	1014.6832	133	2746.7895	178	5599.5604
44	367.4972	89	1036.9168	134	2810.2453	179	5606.2642
45	377.5408	90	1059.4773	135	2872.5454	180	5612.9833

475 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	7.6832	46	397.4368	91	1123.6712	136	3183.8867
2	15.3695	47	408.1402	92	1148.7569	137	3259.9856
3	23.1502	48	419.0340	93	1174.2439	138	3336.9518
4	30.8517	49	429.9862	94	1200.5793	139	3417.3276
5	38.5653	50	441.2823	95	1227.3473	140	3498.5765
6	46.2941	51	452.6484	96	1255.0262	141	3583.4674
7	54.0412	52	464.2333	97	1283.6656	142	3669.2270
8	61.8096	53	475.8952	98	1312.2964	143	3755.7149
9	69.6923	54	487.7887	99	1341.9252	144	3842.7738
10	77.5132	55	499.7663	100	1372.0597	145	3933.6676
11	85.2746	56	512.1493	101	1403.2675	146	4025.0620
12	93.1601	57	524.6308	102	1435.0214	147	4116.7580
13	101.0830	58	537.2112	103	1467.9310	148	4208.5370
14	108.9549	59	550.0622	104	1501.4309	149	4304.2293
15	116.9621	60	563.1953	105	1535.5218	150	4399.8440
16	125.0168	61	576.4438	106	1570.8822	151	4495.1114
17	133.0291	62	589.9912	107	1606.8813	152	4589.7407
18	141.0947	63	603.6635	108	1644.2501	153	4692.9874
19	149.2171	64	617.8436	109	1682.3099	154	4785.7475
20	157.4001	65	632.1673	110	1721.0595	155	4887.2073
21	165.6472	66	646.6357	111	1761.3166	156	4982.0642
22	180.9789	67	661.4546	112	1802.3196	157	5080.4737
23	182.2514	68	676.6398	113	1844.0653	158	5176.8617
24	190.7133	69	691.9917	114	1887.4699	159	5270.8059
25	199.1553	70	707.5113	115	1932.6365	160	5368.0470
26	207.7803	71	723.6530	116	1977.6779	161	5455.9762
27	216.2899	72	739.7536	117	2024.5465	162	5546.6916
28	224.9910	73	756.5133	118	2073.3581	163	5640.3279

480 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	7.8458	46	407.1571	91	1166.8156	136	3462.9656
2	15.6948	47	418.1870	92	1193.4903	137	3552.0801
3	23.6405	48	429.4176	93	1220.6224	138	3642.5384
4	31.5053	49	440.7131	94	1248.6903	139	3737.3585
5	39.3828	50	452.3683	95	1277.2535	140	3833.5784
6	47.2762	51	464.1008	96	1306.8247	141	3934.5113
7	55.1886	52	476.0645	97	1337.4610	142	4036.8944
8	63.1233	53	488.1131	98	1368.1279	143	4140.5742
9	71.1753	54	500.4068	99	1399.9054	144	4245.3749
10	79.1647	55	512.7933	100	1432.2690	145	4355.2619
11	87.0940	56	525.6053	101	1465.8319	146	4466.2414
12	95.1509	57	538.5256	102	1500.0308	147	4578.0813
13	103.2467	58	551.5551	103	1535.5264	148	4690.5215
14	111.2913	59	564.8716	104	1571.7134	149	4808.2914
15	119.4752	60	578.4877	105	1608.5953	150	4926.5151
16	127.7086	61	592.2311	106	1646.9112	151	5044.8597
17	135.8998	62	606.2923	107	1685.9826	152	5162.9591
18	144.1466	63	620.4911	108	1726.6085	153	5292.4402
19	152.4528	64	635.2259	109	1768.0569	154	5409.3320
20	160.8222	65	650.1189	110	1810.3307	155	5537.8002
21	169.2587	66	665.1714	111	1854.3285	156	5658.4918
22	184.9463	67	680.5983	112	1899.2251	157	5784.3043
23	186.2485	68	696.4165	113	1945.0216	158	5908.1298
24	194.9095	69	712.4189	114	1992.7312	159	6029.3888
25	203.5518	70	728.6067	115	2042.4786	160	6155.5032
26	212.3832	71	745.4549	116	2092.1911	161	6270.0700
27	221.0985	72	762.2719	117	2144.0300	162	6388.7973
28	230.0118	73	779.7898	118	2198.1371	163	6511.9164

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

475 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
29	233.6831	74	773.4793	119	2121.9812	164	5723.0212
30	242.5778	75	790.9051	120	2172.6159	165	5808.0620
31	251.4703	76	808.2937	121	2224.1675	166	5888.1650
32	260.4694	77	826.4240	122	2277.8954	167	5970.4085
33	269.5801	78	844.7929	123	2332.6113	168	6039.3514
34	278.8074	79	863.4016	124	2388.2968	169	6109.8355
35	288.0445	80	882.8304	125	2446.3749	170	6173.8242
36	297.4058	81	902.2355	126	2505.4947	171	6230.8772
37	306.8968	82	922.2063	127	2565.6293	172	6288.9502
38	316.5231	83	942.7705	128	2628.3894	173	6331.0707
39	326.1721	84	963.9575	129	2690.5191	174	6373.7361
40	335.9648	85	984.7912	130	2757.1278	175	6408.2679
41	345.9073	86	1006.5957	131	2824.8938	176	6434.4034
42	356.0060	87	1029.0777	132	2891.8190	177	6460.7444
43	366.1415	88	1051.9036	133	2961.6730	178	6478.4205
44	376.4425	89	1075.4548	134	3034.6538	179	6487.2934
45	386.7857	90	1099.3768	135	3106.5225	180	6496.1897

480 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
29	238.9181	74	797.5363	119	2252.1566	164	6621.1305
30	248.0340	75	815.7774	120	2308.5402	165	6733.9213
31	257.1501	76	833.9934	121	2366.0807	166	6840.6074
32	266.3778	77	853.0011	122	2426.1966	167	6950.5958
33	275.7225	78	872.2743	123	2487.5723	168	7043.1512
34	285.1894	79	891.8151	124	2550.1961	169	7138.1117
35	294.6690	80	912.2341	125	2615.6836	170	7224.6171
36	304.2790	81	932.6457	126	2682.5279	171	7301.9848
37	314.0250	82	953.6706	127	2750.7090	172	7380.9678
38	323.9131	83	975.3396	128	2822.0714	173	7438.4013
39	333.8277	84	997.6855	129	2892.9238	174	7496.7044
40	343.8932	85	1019.6792	130	2969.1133	175	7543.9862
41	354.1162	86	1042.7197	131	3046.8716	176	7579.8274
42	364.5034	87	1066.4995	132	3123.9085	177	7615.9992
43	374.9321	88	1090.6676	133	3204.5760	178	7640.2997
44	385.5351	89	1115.6294	134	3289.1388	179	7652.5062
45	396.1855	90	1141.0110	135	3372.6983	180	7664.7505

485 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	8.0102	46	417.0432	91	1211.9166	136	3784.4823
2	16.0236	47	428.4083	92	1240.3025	137	3889.8902
3	24.1358	48	439.9850	93	1269.2093	138	3997.3379
4	32.1658	49	451.6334	94	1299.1496	139	4110.4565
5	40.2090	50	463.6580	95	1329.6561	140	4225.7613
6	48.2687	51	475.7677	96	1361.2800	141	4347.2763
7	56.3483	52	488.1216	97	1394.0864	142	4471.1299
8	64.4511	53	500.5691	98	1426.9701	143	4597.1650
9	72.6741	54	513.2756	99	1461.0920	144	4725.1939
10	80.8340	55	526.0844	100	1495.8927	145	4860.1231
11	88.9331	56	539.3397	101	1532.0357	146	4997.1130
12	97.1633	57	552.7139	102	1568.9192	147	5135.9018
13	105.4342	58	566.2080	103	1607.2606	148	5276.1873
14	113.6535	59	580.0068	104	1646.4112	149	5423.9371
15	122.0162	60	594.1236	105	1686.3787	150	5573.1021
16	130.4306	61	608.3804	106	1727.9699	151	5723.2752
17	138.8029	62	622.9750	107	1770.4544	152	5873.9982
18	147.2333	63	637.7211	108	1814.7082	153	6040.2442
19	155.7257	64	653.0329	109	1859.9409	154	6191.2301
20	164.2841	65	668.5187	110	1906.1610	155	6358.1673
21	172.9125	66	684.1800	111	1954.3593	156	6515.9602
22	188.9612	67	700.2410	112	2003.6404	157	6681.4486
23	190.2937	68	716.7202	113	2054.0119	158	6845.3294
24	199.1566	69	733.4023	114	2106.5982	159	7006.7898
25	208.0023	70	750.2892	115	2161.5512	160	7175.7495
26	217.0434	71	767.8774	116	2216.5890	161	7330.1610
27	225.9677	72	785.4455	117	2274.1128	162	7491.1149
28	235.0967	73	803.7590	118	2334.2976	163	7659.0366
29	244.2207	74	822.3256	119	2394.5323	164	7808.8651
30	253.5618	75	841.4242	120	2457.5607	165	7964.4682
31	262.9054	76	860.5115	121	2522.0490	166	8112.4676
32	272.3660	77	880.4442	122	2589.6042	167	8265.8879
33	281.9490	78	900.6721	123	2658.7662	168	8395.6571
34	291.6601	79	921.1979	124	2729.5343	169	8529.4358
35	301.3872	80	942.6647	125	2803.7556	170	8651.8685
36	311.2508	81	964.1426	126	2879.7442	171	8761.8285
37	321.2572	82	986.2857	127	2957.4926	172	8874.5348
38	331.4127	83	1009.1284	128	3039.1297	173	8956.7784
39	341.5986	84	1032.7072	129	3120.4487	174	9040.5160
40	351.9431	85	1055.9368	130	3208.1899	175	9108.6093
41	362.4531	86	1080.2958	131	3298.0562	176	9160.3371

490 keV

θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	8.1762	46	427.0975	91	1259.1025	136	4158.8479
2	16.3558	47	438.8069	92	1289.3337	137	4284.9906
3	24.6364	48	450.7392	93	1320.1577	138	4414.2064
4	32.8332	49	462.7506	94	1352.1245	139	4550.9369
5	41.0438	50	475.1552	95	1384.7384	140	4691.0493
6	49.2716	51	487.6534	96	1418.5923	141	4839.5222
7	57.5201	52	500.4094	97	1453.7612	142	4991.7200
8	65.7928	53	513.2681	98	1489.0633	143	5147.5049
9	74.1889	54	526.4007	99	1525.7479	144	5306.6988
10	82.5211	55	539.6454	100	1563.2184	145	5475.5127
11	90.7919	56	553.3589	101	1602.1944	146	5648.0067
12	99.1974	57	567.2025	102	1642.0323	147	5823.9093
13	107.6453	58	581.1777	103	1683.5129	148	6002.8899
14	116.0415	59	595.4761	104	1725.9406	149	6192.6907
15	124.5852	60	610.1121	105	1769.3286	150	6385.6733
16	133.1827	61	624.9015	106	1814.5599	151	6581.3594
17	141.7385	62	640.0503	107	1860.8480	152	6779.1891
18	150.3549	63	655.3652	108	1909.1555	153	6999.0702
19	159.0360	64	671.2775	109	1958.6287	154	7200.3094
20	167.7859	65	687.3805	110	2009.2836	155	7424.5373
21	176.6090	66	703.6764	111	2062.2163	156	7638.1709
22	193.0239	67	720.3991	112	2116.4546	157	7864.0071
23	194.3870	68	737.5687	113	2172.0151	158	8089.4710
24	203.4549	69	754.9616	114	2230.1505	159	8313.3990
25	212.5071	70	772.5802	115	2291.0470	160	8549.6582
26	221.7612	71	790.9435	116	2352.1862	161	8767.3218
27	230.8978	72	809.2994	117	2416.2468	162	8996.0058
28	240.2462	73	828.4484	118	2483.4461	163	9236.5696
29	249.5915	74	847.8770	119	2550.8813	164	9452.9409
30	259.1617	75	867.8781	120	2621.6382	165	9679.3968
31	268.7369	76	887.8834	121	2694.2401	166	9896.4561
32	278.4346	77	908.7919	122	2770.5194	167	10123.2040
33	288.2604	78	930.0280	123	2848.8521	168	10316.3931
34	298.2205	79	951.5954	124	2929.2555	169	10516.9055
35	308.1998	80	974.1717	125	3013.8570	170	10701.6291
36	318.3223	81	996.7802	126	3100.7660	171	10868.5350
37	328.5945	82	1020.1106	127	3189.9959	172	11040.6013
38	339.0230	83	1044.2011	128	3284.0262	173	11166.7993
39	349.4863	84	1069.0925	129	3378.0358	174	11295.8474
40	360.1161	85	1093.6399	130	3479.8586	175	11401.2034
41	370.9196	86	1119.4069	131	3584.5687	176	11481.4897

TABLE 6. Geometrical energy broadening (ΔG); θ_{min} and θ_{max} are symmetrically situated around $\theta = 90°$[a]—Continued

485 keV								490 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
42	373.1357	87	1105.4622	132	3387.4078	177	9212.6391	42	381.9045	87	1146.0563	132	3689.1039	177	11562.8891
43	383.8648	88	1131.0664	133	3481.3125	178	9247.8309	43	392.9414	88	1173.1986	133	3799.4256	178	11617.7852
44	394.7772	89	1157.5398	134	3580.1297	179	9265.5250	44	404.1710	89	1201.2939	134	3916.0304	179	11645.4249
45	405.7426	90	1184.4883	135	3678.1567	180	9283.2851	45	415.4594	90	1229.9262	135	4032.2249	180	11673.1935

495 keV								500 keV							
θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG	θ	ΔG
1	8.3439	46	437.3229	91	1308.5134	136	4600.1839	1	8.5133	46	447.7221	91	1360.3022	136	5128.1365
2	16.6914	47	449.3858	92	1340.7373	137	4753.2247	2	17.0304	47	460.1481	92	1394.6812	137	5316.8735
3	25.1420	48	461.6835	93	1373.6356	138	4910.9069	3	25.6529	48	472.8214	93	1429.8272	138	5512.6971
4	33.5075	49	474.0681	94	1407.7990	139	5078.7743	4	34.1886	49	485.5898	94	1466.3755	139	5722.7059
5	41.8872	50	486.8639	95	1442.7017	140	5251.8866	5	42.7392	50	498.7880	95	1503.7686	140	5940.9547
6	50.2849	51	499.7620	96	1478.9827	141	5436.5477	6	51.3085	51	512.0981	96	1542.6959	141	6175.6644
7	58.7041	52	512.9324	97	1516.7283	142	5627.1566	7	59.9003	52	525.6956	97	1583.2573	142	6420.0181
8	67.1485	53	526.2152	98	1554.6737	143	5823.6517	8	68.5183	53	539.4157	98	1624.0978	143	6674.1629
9	75.7195	54	539.7875	99	1594.1656	144	6025.9189	9	77.2660	54	553.4419	99	1666.6718	144	6938.1866
10	84.2259	55	553.4826	100	1634.5675	145	6242.0531	10	85.9486	55	567.6022	100	1710.2996	145	7223.0559
11	92.6705	56	567.6696	101	1676.6613	146	6464.6678	11	94.5687	56	582.2788	101	1755.8330	146	7519.4752
12	101.2533	57	581.9988	102	1719.7584	147	6693.5450	12	103.3308	57	597.1104	102	1802.5350	147	7827.4665
13	109.8803	58	596.4720	103	1764.7108	148	6928.3827	13	112.1390	58	612.0993	103	1851.3377	148	8146.9409
14	118.4554	59	611.2881	104	1810.7723	149	7179.6004	14	120.8952	59	627.4518	104	1901.4402	149	8492.6471
15	127.1822	60	626.4625	105	1857.9631	150	7437.3643	15	129.8073	60	643.1848	105	1952.8720	150	8851.6792
16	135.9652	61	641.8049	106	1907.2525	151	7701.1763	16	138.7780	61	659.1012	106	2006.7002	151	9223.7485
17	144.7067	62	657.5293	107	1957.7927	152	7970.4081	17	147.7076	62	675.4237	107	2062.0109	152	9608.3645
18	153.5115	63	673.4358	108	2010.6454	153	8272.6793	18	156.7031	63	691.9454	108	2119.9786	153	10046.2019
19	162.3837	64	689.9729	109	2064.8876	154	8552.1605	19	165.7690	64	709.1330	109	2179.6052	154	10456.8147
20	171.3278	65	706.7189	110	2120.5455	155	8866.8128	20	174.9098	65	726.5492	110	2240.9305	155	10925.9019
21	180.3481	66	723.6766	111	2178.8364	156	9169.8294	21	184.1301	66	744.1971	111	2305.3124	156	11384.6039
22	197.1344	67	741.0899	112	2238.7037	157	9493.6387	22	201.2932	67	762.3316	112	2371.6014	157	11882.5097
23	198.5287	68	758.9808	113	2300.1763	158	9820.5455	23	202.7189	68	780.9764	113	2439.8437	158	12393.4739
24	207.8047	69	777.1171	114	2364.6566	159	10148.8778	24	212.2061	69	799.8905	114	2511.6170	159	12915.2657
25	217.0664	70	795.5018	115	2432.3741	160	10499.3045	25	221.6806	70	819.0776	115	2587.2063	160	13481.9249
26	226.5369	71	814.6777	116	2500.5420	161	10825.8600	26	231.3708	71	839.1055	116	2663.5196	161	14019.2863
27	235.8891	72	833.8601	117	2572.1621	162	11172.8490	27	240.9422	72	859.1556	117	2743.9374	162	14600.3717
28	245.4605	73	853.8868	118	2647.5066	163	11542.2524	28	250.7401	73	880.1046	118	2828.8039	163	15230.7460
29	255.0310	74	874.2219	119	2723.3383	164	11878.4182	29	260.5396	74	901.3936	119	2914.4965	164	15815.2315
30	264.8342	75	895.1733	120	2803.1459	165	12234.2898	30	270.5799	75	923.3461	120	3004.9842	165	16445.5469
31	274.6451	76	916.1463	121	2885.2921	166	12579.3381	31	280.6307	76	945.3399	121	3098.4487	166	17068.3729
32	284.5842	77	938.0847	122	2971.8815	167	12943.9818	32	290.8156	77	968.3661	122	3197.3276	167	17739.4352
33	294.6575	78	960.3864	123	3061.1044	168	13258.0963	33	301.1409	78	991.7946	123	3299.6016	168	18328.4088
34	304.8712	79	983.0561	124	3153.0066	169	13587.5183	34	311.6132	79	1015.6315	124	3405.3606	169	18957.2300
35	315.1078	80	1006.8080	125	3250.0598	170	13894.1135	35	322.1121	80	1040.6301	125	3517.5058	170	19553.0056
36	325.4944	81	1030.6161	126	3350.1385	171	14173.7405	36	332.7682	81	1065.7122	126	3633.6437	171	20105.4576
37	336.0379	82	1055.2081	127	3453.2914	172	14464.6382	37	343.5887	82	1091.6457	127	3753.8801	172	20689.6026
38	346.7454	83	1080.6264	128	3562.4365	173	14679.7058	38	354.5811	83	1118.4780	128	3881.6923	173	21127.7954
39	357.4921	84	1106.9166	129	3672.0146	174	14901.1489	39	365.6175	84	1146.2604	129	4010.6271	174	21584.7117
40	368.4136	85	1132.8703	130	3791.2188	175	15083.0867	40	376.8372	85	1173.7165	130	4151.5944	175	21964.5462
41	379.5175	86	1160.1425	131	3914.3696	176	15222.4317	41	388.2484	86	1202.5990	131	4298.0072	176	22258.2056
42	390.8119	87	1188.3794	132	4037.8920	177	15364.3309	42	399.8596	87	1232.5376	132	4445.6630	177	22559.7299
43	402.1639	88	1217.1713	133	4168.8817	178	15460.3843	43	411.5345	88	1263.1005	133	4603.1288	178	22765.2729
44	413.7186	89	1247.0088	134	4308.0399	179	15508.8553	44	423.4225	89	1294.8116	134	4771.4197	179	22869.4394
45	425.3384	90	1277.4529	135	4447.4382	180	15557.6261	45	435.3821	90	1327.2079	135	4941.0491	180	22974.5526

[a] $\Delta G(h\nu_o) = h\nu_o \cdot mc^2[(mc^2 - h\nu_o \cdot \cos\theta_{min}) - (mc^2 - h\nu_o \cdot \cos\theta_{max})^{-1}]$

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$

(a) H_2O–Water

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	0.0770	0.0822	20.6838	−2.3610	0.1476	0.1603	21.601	−2.2635	0.1694	0.1846
16.4644	2.3630	0.1175	0.1254	20.7838	1.8846	0.2307	0.2507	21.701	1.8068	0.2671	0.2913
16.5644	1.9673	0.1688	0.1803	20.8838	1.4103	0.4067	0.4421	21.801	1.3520	0.4595	0.5013
16.6644	1.1749	0.4486	0.4794	20.9838	0.9381	0.7862	0.8550	21.901	0.8993	0.8643	0.9435
16.7644	0.5858	0.9953	1.0640	21.0838	0.4681	1.4326	1.5586	22.001	0.4583	1.5068	1.6454
16.8644				21.1838				22.101			
16.9644	+0.5821	1.0175	1.0886	21.2838	+0.4657	1.4573	1.5867	22.201	+0.4473	1.5464	1.6901
17.0644	1.1611	0.4712	0.5043	21.3838	0.9214	0.8271	0.9009	22.301	0.8923	0.8945	0.9780
17.1644	1.7368	0.2294	0.2456	21.4838	1.3910	0.4333	0.4722	22.401	1.3354	0.4896	0.5355
17.2644	2.3091	0.1333	0.1428	21.5838	1.8505	0.2520	0.2747	22.501	1.7765	0.2851	0.3120
17.3644	2.8782	0.0947	0.1015	21.6838	2.3079	0.1667	0.1818	22.601	2.2158	0.1892	0.2071

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	0.1922	0.2103	23.516	−2.0839	0.2151	0.2364	28.5936	−1.7267	0.3732	0.4188
22.6159	1.7299	0.2975	0.3258	23.616	1.6636	0.3359	0.3693	28.6936	1.3791	0.5805	0.6516
22.7159	1.2938	0.5173	0.5666	23.716	1.2448	0.5755	0.6328	28.7936	1.0326	0.9343	1.0492
22.8159	0.8595	0.9478	1.0385	23.816	0.8278	1.0272	1.1301	28.8936	0.6874	1.4935	1.6778
22.9159	0.4270	1.6186	1.7742	23.916	0.4124	1.7134	1.8858	28.9936	0.343	2.2067	2.4802
23.0159				24.016				29.0936			
23.1159	+0.4325	1.6315	1.7897	24.116	+0.4135	1.7351	1.9112	29.1936	+0.3421	2.2372	2.5165
23.2159	0.8597	0.9725	1.0672	24.216	0.8240	1.0589	1.1669	29.2936	0.6831	1.5320	1.7240
23.3159	1.2851	0.5441	0.5974	24.316	1.2329	0.6060	0.6680	29.3936	1.0228	0.9729	1.0953
23.4159	1.7987	0.3214	0.3530	24.416	1.6401	0.3614	0.3985	29.4936	1.3616	0.6185	0.6966
23.5159	2.1306	0.2112	0.2321	24.516	2.0458	0.2357	0.2601	29.5936	1.6992	0.4075	0.4592

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	0.4196	0.4729	30.7617	−1.6128	0.4590	0.5196	31.878	−1.5598	0.5097	0.5797
29.7684	1.3276	0.6452	0.7275	30.8617	1.2889	0.7041	0.7975	31.978	1.2469	0.7676	0.8736
29.8684	0.9932	1.0191	1.1496	30.9617	0.9660	1.1010	1.2476	32.078	0.9350	1.1922	1.3572
29.9684	0.6599	1.6035	1.8095	31.0617	0.6441	1.6958	1.9224	32.178	0.6239	1.7984	2.0483
30.0684	0.3276	2.3220	2.6215	31.1617	0.3232	2.4108	2.7342	32.278	0.3138	2.5185	2.8696
30.1684				31.2617				32.378			
30.2684	+0.3338	2.3298	2.6324	31.3617	+0.3157	2.4524	2.7836	32.478	+0.3038	2.5584	2.9175
30.3684	0.6629	1.6304	1.8429	31.4617	0.6338	1.7487	1.9857	32.578	0.6113	1.8594	2.1213
30.4684	0.9911	1.0510	1.1885	31.5617	0.9509	1.1562	1.3135	32.678	0.9179	1.2544	1.4316
30.5684	1.3182	0.6781	0.7672	31.6617	1.2670	0.7516	0.8542	32.778	1.2236	0.8194	0.9356
30.6684	1.6444	0.4488	0.5080	31.7617	1.5882	0.4956	0.5635	32.878	1.5284	0.5862	0.6350

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	0.5616	0.6418	36.5187	−1.3653	0.7460	0.8652	38.9574	−1.2853	0.8846	1.0367
33.1057	1.2101	0.8292	0.9481	36.6187	1.0909	1.0832	1.2568	39.0574	1.0274	1.2621	1.4796
33.2057	0.9084	1.2793	1.4633	36.7187	0.8172	1.5883	1.8438	39.1574	0.7706	1.7951	2.1054
33.3057	0.6075	1.8961	2.1697	36.8187	0.5442	2.2584	2.6227	39.2574	0.5135	2.4892	2.9208
33.4057	0.3075	2.6153	2.9940	36.9187	0.2719	2.9571	3.4356	39.3574	0.2575	3.1783	3.7309
33.5057				37.0187				39.4574			
33.6057	+0.2899	2.6719	3.0613	37.1187	+0.2708	2.9841	3.4699	39.5574	+0.2528	3.2126	3.7744
33.7057	0.5875	2.0495	2.3492	37.2187	0.5411	2.3050	2.6814	39.6574	0.5072	2.5461	2.9926
33.8057	0.8841	1.3566	1.5556	37.3187	0.8108	1.6343	1.9020	39.7574	0.7609	1.8598	2.1869
33.9057	1.1800	0.8959	1.0277	37.4187	1.0797	1.1420	1.3297	39.8574	1.0139	1.2924	1.5203
34.0057	1.4809	0.6099	0.6999	37.5187	1.3480	0.7954	0.9264	39.9574	1.2664	0.9408	1.1072

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	1.0292	1.2190	44.055	−1.1395	1.2238	1.4656	46.7136	−1.0796	1.4009	1.6970
41.5642	0.9688	1.4568	1.7261	44.155	0.9104	1.6774	2.0097	46.8136	0.8628	1.8919	2.2927
41.6642	0.7265	2.0237	2.3990	44.255	0.6816	2.2708	2.7219	46.9136	0.6465	2.5148	3.0490
41.7642	0.4847	2.7272	3.2343	44.355	0.4534	2.9886	3.5837	47.0136	0.4306	3.2380	3.9275
41.8642	0.2434	3.4059	4.0410	44.455	0.2256	3.6496	4.3783	47.1136	0.2151	3.8676	4.6932
41.9642				44.555				47.2136			
42.0642	+0.2376	3.4413	4.0864	44.655	+0.2286	3.6676	4.4037	47.3136	+0.2145	3.9104	4.7493
42.1642	0.4773	2.7868	3.3106	44.755	0.4550	3.0261	3.6349	47.4136	0.4228	3.3024	4.0125
42.2642	0.7165	2.0939	2.4885	44.855	0.6809	2.3232	2.7919	47.5136	0.6426	2.5745	3.1294
42.3642	0.9552	1.5269	1.8154	44.955	0.9064	1.7333	2.0838	47.6136	0.8561	1.9570	2.3798
42.4642	1.1934	1.0907	1.2974	45.055	1.1324	1.2701	1.5276	47.7136	1.0691	1.4636	1.7806

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	2.2848	2.9092	59.6952	−0.7861	2.6295	3.3712
58.2402	0.8628	2.8835	3.6730	59.7952	0.6143	3.2933	4.2241
58.3402	0.6465	3.5897	4.5746	59.8952	0.4428	4.0240	5.1636
58.4402	0.4306	4.3068	5.4909	59.9952	0.2714	4.7013	6.0355
58.5402	0.2151	4.8909	6.2384	60.0952	0.1668	5.0271	6.4565
58.6402				60.1952			
58.7402	+0.2145	4.9030	6.2593	60.2952	+0.1727	5.0390	6.4777
58.8402	0.4228	4.3368	5.5390	60.3952	0.3432	4.4805	5.7622
58.9402	0.6426	3.6141	4.6180	60.4952	0.5133	3.7823	4.8664
59.0402	0.8561	2.9315	3.7475	60.5952	0.6832	3.0794	3.9637
59.1402	1.0691	2.3452	2.9992	60.6952	0.8528	2.4715	3.1827

(b) C_2H_4–Polyethylene

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	0.1115	0.1190	20.6838	−2.3610	0.1971	0.2140	21.601	−2.2635	0.2199	0.2397
16.4644	2.3630	0.1574	0.1680	20.7838	1.8846	0.2752	0.2990	21.701	1.8068	0.3195	0.3485
16.5644	1.9673	0.2053	0.2193	20.8838	1.4103	0.4590	0.4990	21.801	1.3520	0.5281	0.5762
16.6644	1.1749	0.5349	0.5716	20.9838	0.9381	1.0597	1.1524	21.901	0.8993	1.2004	1.3104
16.7644	0.5858	1.6877	1.8041	21.0838	0.4681	2.6454	2.8780	22.001	0.4583	2.7416	2.9939
16.8644				21.1838				22.101			
16.9644	+0.5821	1.7301	1.8509	21.2838	+0.4657	2.6351	2.8691	22.201	+0.4473	2.8313	3.0944
17.0644	1.1611	0.5706	0.6107	21.3838	0.9214	1.1335	1.2347	22.301	0.8923	1.2458	1.3621
17.1644	1.7368	0.2657	0.2845	21.4838	1.3910	0.4925	0.5366	22.401	1.3354	0.5651	0.6181
17.2644	2.3091	0.1752	0.1877	21.5838	1.8505	0.2986	0.3255	22.501	1.7765	0.3328	0.3641
17.3644	2.8782	0.1375	0.1473	21.6838	2.3079	0.2191	0.2390	22.601	2.2158	0.2426	0.2655

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	0.2437	0.2666	23.516	−2.0839	0.2673	0.2937	28.5936	−1.7267	0.4322	0.4849
22.6159	1.7299	0.3444	0.3771	23.616	1.6636	0.3847	0.4228	28.6936	1.3791	0.6630	0.7442
22.7159	1.2938	0.6038	0.6613	23.716	1.2448	0.6775	0.7451	28.7936	1.0326	1.1948	1.3417
22.8159	0.8595	1.3421	1.4704	23.816	0.8278	1.4847	1.6334	28.8936	0.6874	2.3622	2.6539
22.9159	0.4270	2.9916	3.2791	23.916	0.4124	3.1891	3.5100	28.9936	0.3430	4.2288	4.7529
23.0159				24.016				29.0936			
23.1159	+0.4325	3.0087	3.3006	24.116	+0.4135	3.2293	3.5571	29.1936	+0.3421	4.2816	4.8163
23.2159	0.8597	1.3769	1.5111	24.216	0.8240	1.5297	1.6857	29.2936	0.6831	2.4303	2.7349
23.3159	1.2851	0.6354	0.6976	24.316	1.2329	0.7151	0.7884	29.3936	1.0228	1.2473	1.4042
23.4159	1.7987	0.3706	0.4070	24.416	1.6401	0.4124	0.4548	29.4936	1.3616	0.7094	0.7990
23.5159	2.1306	0.2658	0.2921	24.516	2.0458	0.2915	0.3216	29.5936	1.6992	0.4693	0.5288

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	0.4804	0.5415	30.7617	−1.6128	0.5216	0.5905	31.878	−1.5598	0.5783	0.6578
29.7684	1.3276	0.7474	0.8427	30.8617	1.2889	0.8195	0.9283	31.978	1.2469	0.9035	1.0281
29.8684	0.9932	1.3208	1.4899	30.9617	0.9660	1.4719	1.6679	32.078	0.9350	1.6186	1.8428
29.9684	0.6599	2.6010	2.9352	31.0617	0.6441	2.7731	3.1437	32.178	0.6239	2.9687	3.3812
30.0684	0.3276	4.4819	5.0600	31.1617	0.3232	4.6568	5.2814	32.278	0.3138	4.8799	5.5603
30.1684				31.2617				32.378			
30.2684	+0.3338	4.4845	5.0671	31.3617	+0.3157	4.7488	5.3902	32.478	+0.3038	4.9855	5.6854
30.3684	0.6629	2.6253	2.9675	31.4617	0.6338	2.8688	3.2576	32.578	0.6113	3.0899	3.5251
30.4684	0.9911	1.3683	1.5473	31.5617	0.9509	1.5571	1.7688	32.678	0.9179	1.7218	1.9651
30.5684	1.3182	0.7860	0.8892	31.6617	1.2670	0.8813	1.0015	32.778	1.2236	0.9688	1.1061
30.6684	1.6444	0.5127	0.5803	31.7617	1.5882	0.5625	0.6396	32.878	1.5284	0.6308	0.7205

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	0.6370	0.7280	36.5187	−1.3653	0.3153	0.3657	38.9574	−1.2853	1.0331	1.2106
33.1057	1.2101	0.9824	1.1232	36.6187	1.0909	0.4926	0.5716	39.0574	1.0274	1.6165	1.8952
33.2057	0.9084	1.7664	2.0205	36.7187	0.8172	0.8436	0.9793	39.1574	0.7706	2.6825	3.1462
33.3057	0.6075	3.1579	3.6136	36.8187	0.5442	1.4405	1.6729	39.2574	0.5135	4.3943	5.1562
33.4057	0.3075	5.0845	5.8208	36.9187	0.2719	2.1336	2.4789	39.3574	0.2575	6.2741	7.3652
33.5057				37.0187				39.4574			
33.6057	+0.2899	5.2243	5.9858	37.1187	+0.2708	2.1465	2.4960	39.5574	+0.2528	6.3506	7.4614
33.7057	0.5875	3.3389	3.8271	37.2187	0.5411	1.4664	1.7058	39.6574	0.5072	4.5117	5.3030
33.8057	0.8841	1.8998	2.1786	37.3187	0.8108	0.8671	1.0091	39.7574	0.7609	2.8083	3.3022
33.9057	1.1800	1.0749	1.2331	37.4187	1.0797	0.5235	0.6095	39.8574	1.0139	1.7019	2.0020
34.0057	1.4809	0.6916	0.7938	37.5187	1.3480	0.3338	0.3889	39.9574	1.2664	1.1031	1.2982

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	1.2097	1.4328	44.055	−1.1395	1.4910	1.7856	46.7136	−1.0796	1.7616	2.1339
41.5642	0.9688	1.9238	2.2795	44.155	0.9104	2.3128	2.7710	46.8136	0.8628	2.6809	3.2490
41.6642	0.7265	3.1212	3.7001	44.255	0.6816	3.6072	4.3237	46.9136	0.6465	4.0943	4.9641
41.7642	0.4847	4.8914	5.8010	44.355	0.4534	5.4472	6.5322	47.0136	0.4306	5.9784	7.2517
41.8642	0.2434	6.7507	8.0097	44.455	0.2256	7.2669	8.7183	47.1136	0.2151	7.7214	9.3701
41.9642				44.555				47.2136			
42.0642	+0.2376	6.8298	8.1105	44.655	+0.2286	7.2981	8.7632	47.3136	+0.2145	7.8114	9.4875
42.1642	0.4773	5.0184	5.9618	44.755	0.4550	5.5210	6.6321	47.4136	0.4228	6.1185	7.4344
42.2642	0.7165	3.2520	3.8649	44.855	0.6809	3.6969	4.4427	47.5136	0.6426	4.2036	5.1098
42.3642	0.9552	2.0395	2.4249	44.955	0.9064	2.3968	2.8815	47.6136	0.8561	2.7839	3.3854
42.4642	1.1934	1.2991	1.5453	45.055	1.1324	1.5621	1.8788	47.7136	1.0691	1.8319	2.2287

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	3.2190	4.0986	59.6952	−0.7861	3.8858	4.9818
58.2402	0.8628	4.5232	5.7618	59.7952	0.6143	5.4572	6.9998
58.3402	0.6465	6.3033	8.0330	59.8952	0.4428	7.3856	9.4777
58.4402	0.4306	8.2431	10.5101	59.9952	0.2714	9.2426	11.8665
58.5402	0.2151	9.8540	12.5697	60.0952	0.1668	10.1372	13.0210
58.6402				60.1952			
58.7402	+0.2145	9.8928	12.6305	60.2952	+0.1727	10.1524	13.0521
58.8402	0.4228	8.2785	10.5739	60.3952	0.3432	8.5853	11.0420
58.9402	0.6426	6.3705	8.1403	60.4952	0.5133	6.6686	8.5803
59.0402	0.8561	4.5914	5.8695	60.5952	0.6832	4.8908	6.2955
59.1402	1.0691	3.3025	4.2235	60.6952	0.8528	3.5202	4.5331

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

(c) $C_5H_8O_2$–Lucite

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	0.4313	0.4603	20.6838	−2.3610	0.7801	0.8473	21.601	−2.2635	0.8780	0.9572
16.4644	2.3630	0.6223	0.6645	20.7838	1.8846	1.1266	1.2242	21.701	1.8068	1.2835	1.3999
16.5644	1.9673	0.8363	0.8933	20.8838	1.4103	1.8811	2.0448	21.801	1.3520	2.1374	2.3321
16.6644	1.1749	2.1044	2.2487	20.9838	0.9381	3.8841	4.2240	21.901	0.8993	4.3344	4.7314
16.7644	0.5858	5.4949	5.8742	21.0838	0.4681	8.2798	9.0085	22.001	0.4583	8.5908	9.3820
16.8644				21.1838				22.101			
16.9644	+0.5821	5.6263	6.0195	21.2838	+0.4657	8.2753	9.0109	22.201	+0.4473	8.8418	9.6640
17.0644	1.1611	2.2281	2.3848	21.3838	0.9214	4.1225	4.4906	22.301	0.8923	4.4891	4.9083
17.1644	1.7368	1.0948	1.1722	21.4838	1.3910	2.0097	2.1900	22.401	1.3354	2.2802	2.4941
17.2644	2.3091	0.6969	0.7465	21.5838	1.8505	1.2244	1.3348	22.501	1.7765	1.3690	1.4980
17.3644	2.8782	0.5176	0.5547	21.6838	2.3079	0.8714	0.9504	22.601	2.2158	0.9723	1.0643

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	0.9799	1.0723	23.516	−2.0839	1.0820	1.1890	28.5936	−1.7267	1.7802	1.9975
22.6159	1.7299	1.4189	1.5533	23.616	1.6636	1.5872	1.7447	28.6936	1.3791	2.6957	3.0260
22.7159	1.2938	2.4174	2.6476	23.716	1.2448	2.6949	2.9636	28.7936	1.0326	4.5166	5.0722
22.8159	0.8595	4.7942	5.2530	23.816	0.8278	5.2507	5.7767	28.8936	0.6874	7.9686	8.9530
22.9159	0.4270	9.2940	10.1881	23.916	0.4124	9.8703	10.8645	28.9936	0.3430	12.8736	14.4715
23.0159				24.016				29.0936			
23.1159	+0.4321	9.3587	10.2675	24.116	+0.4135	9.9950	11.0108	29.1936	+0.3421	13.0294	14.6589
23.2159	0.8597	4.9191	5.3986	24.216	0.8240	5.4082	5.9598	29.2936	0.6831	8.1856	9.2122
23.3159	1.2851	2.5423	2.7912	24.316	1.2329	2.8395	3.1303	29.3936	1.0228	4.7080	5.3004
23.4159	1.7987	1.5276	1.6778	24.416	1.6401	1.7026	1.8778	29.4936	1.3616	2.8756	3.2387
23.5159	2.1306	1.0714	1.1773	24.516	2.0458	1.1814	1.3035	29.5936	1.6992	1.9353	2.1806

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	1.9823	2.2342	30.7617	−1.6128	2.1553	2.4402	31.878	−1.5598	2.3832	2.7109
29.7684	1.3276	3.0088	3.3926	30.8617	1.2889	3.2835	3.7193	31.978	1.2469	3.5942	4.0902
29.8684	0.9932	4.9514	5.5854	30.9617	0.9660	5.4351	6.1590	32.078	0.9350	5.9167	6.7361
29.9684	0.6599	8.6733	9.7884	31.0617	0.6441	9.2012	10.4317	32.178	0.6239	9.7928	11.1544
30.0684	0.3276	13.5912	15.3469	31.1617	0.3232	14.1162	16.0126	32.278	0.3138	14.7575	16.8186
30.1684				31.2617				32.378			
30.2684	+0.3338	13.6202	15.3925	31.3617	+0.3157	14.3671	16.3112	32.478	+0.3038	15.0464	17.1624
30.3684	0.6629	8.7733	9.9179	31.4617	0.6338	9.4957	10.7836	32.578	0.6113	10.1621	11.5945
30.4684	0.9911	5.1201	5.7901	31.5617	0.9509	5.7219	6.5003	32.678	0.9179	6.2565	7.14093
30.5684	1.3182	3.1620	3.5772	31.6617	1.2670	3.5155	3.9954	32.778	1.2236	3.8417	4.3864
30.6684	1.6444	2.1160	2.3949	31.7617	1.5882	2.3225	2.6405	32.878	1.5284	2.5945	2.9636

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	2.6180	2.9920	36.5187	−1.3653	3.4672	4.0215	38.9574	−1.2853	4.1333	4.8438
33.1057	1.2101	3.8895	4.4472	36.6187	1.0909	5.1588	5.9862	39.0574	1.0274	6.1033	7.1556
33.2057	0.9084	6.3980	7.3185	36.7187	0.8172	8.0994	9.4027	39.1574	0.7706	9.3167	10.9283
33.3057	0.6075	10.3701	11.8680	36.8187	0.5442	12.5964	14.6311	39.2574	0.5135	13.9953	16.4252
33.4057	0.3075	15.3563	17.5843	36.9187	0.2719	17.4373	20.2657	39.3574	0.2575	18.7720	22.0445
33.5057				37.0187				39.4574			
33.6057	+0.2899	15.7275	18.0246	37.1187	+0.2708	17.5742	20.4423	39.5574	+0.2528	18.9846	22.3132
33.7057	0.5875	11.0261	12.6401	37.2187	0.5411	12.8713	14.9758	39.6574	0.5072	14.3430	16.8621
33.8057	0.8841	6.8289	7.8311	37.3187	0.8108	8.3682	9.73954	39.7574	0.7609	9.7092	11.4178
33.9057	1.1800	4.2207	4.8421	37.4187	1.0797	5.4820	6.3827	39.8574	1.0139	6.3494	7.4695
34.0057	1.4809	2.8386	3.2578	37.5187	1.3480	3.7000	4.3097	39.9574	1.2664	4.4006	5.1790

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	4.8063	5.6928	44.055	−1.1395	5.7957	6.9412	46.7136	−1.0796	6.7264	8.1484
41.5642	0.9688	7.1346	8.4545	44.155	0.9104	8.3837	10.0455	46.8136	0.8628	9.5755	11.6055
41.6642	0.7265	10.6712	12.6515	44.255	0.6816	12.1413	14.5553	46.9136	0.6465	13.6050	16.4982
41.7642	0.4847	15.4484	18.3258	44.355	0.4534	17.0504	20.4526	47.0136	0.4306	18.5849	22.5511
41.8642	0.2434	20.1478	23.9151	44.455	0.2256	21.6262	25.9578	47.1136	0.2151	22.9706	27.8906
41.9642				44.555				47.2136			
42.0642	+0.2376	20.3665	24.1956	44.655	+0.2286	21.7276	26.1021	47.3136	+0.2145	23.2057	28.2008
42.1642	0.4773	15.8147	18.7926	44.755	0.4550	17.2748	20.7576	47.4136	0.4228	18.9843	23.0759
42.2642	0.7165	11.0742	13.1632	44.855	0.6809	12.4316	14.9418	47.5136	0.6426	13.9527	16.9638
42.3642	0.9552	7.5209	8.9427	44.955	0.9064	8.6745	10.4296	47.6136	0.8561	9.9228	12.0682
42.4642	1.1934	5.1258	6.0973	45.055	1.1324	6.0445	7.2703	47.7136	1.0691	6.9994	8.5159

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	11.5338	14.6878	59.6952	−0.7861	13.5739	17.4063
58.2402	0.8628	15.3247	19.5264	59.7952	0.6143	17.9686	23.0559
58.3402	0.6465	20.1342	25.6713	59.8952	0.4428	23.0331	29.5749
58.4402	0.4306	25.1134	32.0428	59.9952	0.2714	27.7250	35.6255
58.5402	0.2151	29.1060	37.1633	60.0952	0.1668	29.9257	38.4764
58.6402				60.1952			
58.7402	+0.2145	29.2272	37.3515	60.2952	+0.1727	29.9874	38.5903
58.8402	0.4228	25.2491	32.2732	60.3952	0.3432	26.1369	33.6411
58.9402	0.6426	20.3256	25.9844	60.4952	0.5133	21.2482	27.3532
59.0402	0.8561	15.5684	19.9074	60.5952	0.6832	16.4679	21.2041
59.1402	1.0691	11.8342	15.1373	60.6952	0.8528	12.5385	16.1495

(d) C_8H_8–Polystyrene

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	0.4440	0.4738	20.6838	−2.3610	0.7778	0.8448	21.601	−2.2635	0.8655	0.9436
16.4644	2.3630	0.6214	0.6634	20.7838	1.8846	1.0702	1.1629	21.701	1.8068	1.2120	1.3219
16.5644	1.9673	0.8017	0.8563	20.8838	1.4103	1.7295	1.8800	21.801	1.3520	1.9766	2.1567
16.6644	1.1749	1.9661	2.1009	20.9838	0.9381	3.7886	4.1201	21.901	0.8993	4.2746	4.6661
16.7644	0.5858	5.7973	6.1975	21.0838	0.4681	8.9829	9.7736	22.001	0.4583	9.2641	10.1173
16.8644				21.1838				22.101			
16.9644	+0.5821	5.9416	6.3569	21.2838	+0.4657	8.9042	9.6958	22.201	+0.4473	9.5528	10.4413
17.0644	1.1611	2.0948	2.2420	21.3838	0.9214	4.0467	4.4079	22.301	0.8923	4.4307	4.8444
17.1644	1.7368	1.0252	1.0977	21.4838	1.3910	1.8524	2.0186	22.401	1.3354	2.1114	2.3095
17.2644	2.3091	0.6905	0.7396	21.5838	1.8505	1.1595	1.2641	22.501	1.7765	1.2869	1.4081
17.3644	2.8782	0.5291	0.5670	21.6838	2.3079	0.8635	0.9417	22.601	2.2158	0.9534	1.0437

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	0.9565	1.0467	23.516	−2.0839	1.0473	1.1507	28.5936	−1.7267	1.6664	1.8698
22.6159	1.7299	1.3279	1.4537	23.616	1.6636	1.4768	1.6233	28.6936	1.3791	2.4882	2.7931
22.7159	1.2938	2.2461	2.4600	23.716	1.2448	2.5102	2.7605	28.7936	1.0326	4.3271	4.8594
22.8159	0.8595	4.7594	5.2148	23.816	0.8278	5.2514	5.7776	28.8936	0.6874	8.2170	9.2321
22.9159	0.4270	10.0700	11.0390	23.916	0.4124	10.7173	11.7970	28.9936	0.3430	14.0994	15.8500
23.0159				24.016				29.0936			
23.1159	+0.4325	10.1335	11.1177	24.116	+0.4135	10.8526	11.9558	29.1936	+0.3421	14.2610	16.0451
23.2159	0.8597	4.8834	5.3595	24.216	0.824	5.4068	5.9583	29.2936	0.6831	8.4490	9.5086
23.3159	1.2851	2.3623	2.5936	24.316	1.2329	2.6467	2.9178	29.3936	1.0228	4.5144	5.0824
23.4159	1.7987	1.4268	1.5671	24.416	1.6401	1.5814	1.7441	29.4936	1.3616	2.6576	2.9932
23.5159	2.1306	1.0424	1.1454	24.516	2.0458	1.1408	1.2587	29.5936	1.6992	1.8065	2.0354

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	1.8444	2.0788	30.7617	−1.6128	1.9974	2.2615	31.878	−1.5598	2.2039	2.5070
29.7684	1.3276	2.7895	3.1454	30.8617	1.2889	3.0467	3.4510	31.978	1.2469	3.3475	3.8094
29.8684	0.9932	4.7646	5.3747	30.9617	0.9660	5.2919	5.9968	32.078	0.9350	5.7889	6.5906
29.9684	0.6599	9.0223	10.1824	31.0617	0.6441	9.5947	10.8779	32.178	0.6239	10.2404	11.6643
30.0684	0.3276	14.9175	16.8451	31.1617	0.3232	15.4972	17.5798	32.278	0.3138	16.2140	18.4794
30.1684				31.2617				32.378			
30.2684	+0.3338	14.9371	16.8814	31.3617	+0.3157	15.7822	17.9184	32.478	+0.3038	16.5630	18.8933
30.3684	0.6629	9.1001	10.2874	31.4617	0.6338	9.9101	11.2544	32.578	0.6113	10.6509	12.1523
30.4684	0.9911	4.9364	5.5824	31.5617	0.9509	5.5839	6.3435	32.678	0.9179	6.1448	7.0134
30.5684	1.3182	2.9315	3.3164	31.6617	1.2670	3.2706	3.7169	32.778	1.2236	3.5829	4.0910
30.6684	1.6444	1.9662	2.2253	31.7617	1.5882	2.1499	2.4443	32.878	1.5284	2.3972	2.7383

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	2.4177	2.7631	36.5187	−1.3653	3.2034	3.7155	38.9574	−1.2853	3.8406	4.5008
33.1057	1.2101	3.6297	4.1501	36.6187	1.0909	4.8812	5.6640	39.0574	1.0274	5.8498	6.8584
33.2057	0.9084	6.2969	7.2028	36.7187	0.8172	8.0918	9.3939	39.1574	0.7706	9.4235	11.0536
33.3057	0.6075	10.8757	12.4467	36.8187	0.5442	13.3857	15.5486	39.2574	0.5135	14.9519	17.5484
33.4057	0.3075	16.8905	19.3420	36.9187	0.2719	19.2389	22.3613	39.3574	0.2575	20.7367	24.3537
33.5057				37.0187				39.4574			
33.6057	+0.2899	17.3278	19.8597	37.1187	+0.2708	19.3827	22.5475	39.5574	+0.2528	20.9794	24.6600
33.7057	0.5875	11.4621	13.1400	37.2187	0.5411	13.6881	15.9265	39.6574	0.5072	15.3422	18.0373
33.8057	0.8841	6.7541	7.7454	37.3187	0.8108	8.3819	9.7555	39.7574	0.7609	9.8582	11.5931
33.9057	1.1800	3.9552	4.5375	37.4187	1.0797	5.2206	6.0784	39.8574	1.0139	6.1541	7.2397
34.0057	1.4809	2.6194	3.0063	37.5187	1.3480	3.4233	3.9874	39.9574	1.2664	4.0940	4.8181

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	4.4702	5.2947	44.055	−1.1395	5.4581	6.5368	46.7136	−1.0796	6.4070	7.7616
41.5642	0.9688	6.9106	8.1890	44.155	0.9104	8.2471	9.8817	46.8136	0.8628	9.5094	11.5256
41.6642	0.7265	10.9124	12.9376	44.255	0.6816	12.5376	15.0306	46.9136	0.6465	14.1634	17.1756
41.7642	0.4847	16.5863	19.6764	44.355	0.4534	18.3960	22.0679	47.0136	0.4306	20.1307	24.4284
41.8642	0.2434	22.2817	26.4507	44.455	0.2256	23.9472	28.7472	47.1136	0.2151	25.4613	30.9191
41.9642				44.555				47.2136			
42.0642	+0.2376	22.5318	26.7708	44.655	+0.2286	24.0553	28.9019	47.3136	+0.2145	25.7207	31.2615
42.1642	0.4773	17.0005	20.2025	44.755	0.4550	18.6442	22.4043	47.4136	0.4228	20.5851	25.0234
42.2642	0.7165	11.3498	13.4908	44.855	0.6809	12.8442	15.4385	47.5136	0.6426	14.5406	17.6789
42.3642	0.9552	7.3157	8.6987	44.955	0.9064	8.5417	10.2699	47.6136	0.8561	9.8676	12.0010
42.4642	1.1934	4.7920	5.7001	45.055	1.1324	5.7137	6.8723	47.7136	1.0691	6.6510	8.0919

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	11.4315	14.5575	59.6952	−0.7861	13.6770	17.5386
58.2402	0.8628	15.7592	20.0802	59.7952	0.6143	18.8140	24.1415
58.3402	0.6465	21.4752	27.3850	59.8952	0.4428	24.9038	31.9804
58.4402	0.4306	27.4952	35.0871	59.9952	0.2714	30.5915	39.3169
58.5402	0.2151	32.3348	41.2959	60.0952	0.1668	33.2534	42.7661
58.6402				60.1952			
58.7402	+0.2145	32.4903	41.5317	60.2952	+0.1727	33.3140	42.8823
58.8402	0.4228	27.6194	35.3084	60.3952	0.3432	28.6246	36.8493
58.9402	0.6426	21.7100	27.7562	60.4952	0.5133	22.6904	29.2120
59.0402	0.8561	16.0014	20.4614	60.5952	0.6832	17.0060	21.8975
59.1402	1.0691	11.7267	14.9997	60.6952	0.8528	12.4741	16.0665

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

(e) $C_6H_{11}NO$–Nylon

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	0.4750	0.5070	20.6838	−2.3610	0.8500	0.9232	21.601	−2.2635	0.9536	1.0396
16.4644	2.363	0.6785	0.7245	20.7838	1.8846	1.2131	1.3182	21.701	1.8068	1.3891	1.5150
16.5644	1.9673	0.9018	0.9633	20.8838	1.4103	2.0286	2.2052	21.801	1.3520	2.3162	2.5272
16.6644	1.1749	2.3058	2.4638	20.9838	0.9381	4.3451	4.7253	21.901	0.8993	4.8817	5.3288
16.7644	0.5858	6.3955	6.8370	21.0838	0.4681	9.7494	10.6077	22.001	0.4583	10.1232	11.0558
16.8644				21.1838				22.101			
16.9644	+0.5821	6.5507	7.0087	21.2838	+0.4657	9.7463	10.6130	22.201	+0.4473	10.4304	11.4007
17.0644	1.1611	2.4456	2.6176	21.3838	0.9214	4.6288	5.0421	22.301	0.8923	5.0593	5.5317
17.1644	1.7368	1.1762	1.2594	21.4838	1.3910	2.1713	2.3661	22.401	1.3354	2.4738	2.7058
17.2644	2.3091	0.7580	0.8119	21.5838	1.8505	1.3178	1.4366	22.501	1.7765	1.4699	1.6084
17.3644	2.8782	0.5735	0.6146	21.6838	2.3079	0.9478	1.0337	22.601	2.2158	1.0545	1.1544

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	1.0611	1.1612	23.516	−2.0839	1.1694	1.2849	28.5936	−1.7267	1.9138	2.1474
22.6159	1.7299	1.5254	1.6700	23.616	1.6636	1.7058	1.8751	28.6936	1.3791	2.9138	3.2708
22.7159	1.2938	2.6311	2.8817	23.716	1.2448	2.9394	3.2325	28.7936	1.0326	5.0116	5.6281
22.8159	0.8595	5.4175	5.9359	23.816	0.8278	5.9532	6.5497	28.8936	0.6874	9.1736	10.3071
22.9159	0.4270	10.9823	12.0393	23.916	0.4124	11.6775	12.8542	28.9936	0.3430	15.3079	17.2092
23.0159				24.016				29.0936			
23.1159	+0.4325	11.0544	12.1282	24.116	+0.4135	11.8249	13.0272	29.1936	+0.3421	15.4951	17.4343
23.2159	0.8597	5.5584	6.1003	24.216	0.824	6.1335	6.7592	29.2936	0.6831	9.4280	10.6106
23.3159	1.2851	2.7668	3.0377	24.316	1.2329	3.0991	3.4165	29.3936	1.0228	5.2267	5.8844
23.4159	1.7987	1.6424	1.8040	24.416	1.6401	1.8296	2.0178	29.4936	1.3616	3.1119	3.5048
23.5159	2.1306	1.1595	1.2741	24.516	2.0458	1.2757	1.4075	29.5936	1.6992	2.0801	2.3437

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	2.1304	2.4012	30.7617	−1.6128	2.3156	2.6217	31.878	−1.5598	2.5636	2.9161
29.7684	1.3276	3.2673	3.6840	30.8617	1.2889	3.5708	4.0447	31.978	1.2469	3.9200	4.4609
29.8684	0.9932	5.5104	6.2160	30.9617	0.9660	6.0742	6.8833	32.078	0.9350	6.6371	7.5564
29.9684	0.6599	10.0182	11.3066	31.0617	0.6441	10.6464	12.0704	32.178	0.6239	11.3533	12.9323
30.0684	0.3276	16.1824	18.2744	31.1617	0.3232	16.8084	19.0683	32.278	0.3138	17.5843	20.0422
30.1684				31.2617				32.378			
30.2684	+0.3338	16.2091	18.3197	31.3617	+0.3157	17.1188	19.4369	32.478	+0.3038	17.9429	20.4683
30.3684	0.6629	10.1297	11.4515	31.4617	0.6338	10.9970	12.4889	32.578	0.6113	11.7939	13.4568
30.4684	0.9911	5.7001	6.4461	31.5617	0.9509	6.4092	7.2812	32.678	0.9179	7.0318	8.0259
30.5684	1.3182	3.4342	3.8852	31.6617	1.2670	3.8270	4.3493	32.778	1.2236	4.1949	4.7898
30.6684	1.6444	2.2748	2.5746	31.7617	1.5882	2.4963	2.8381	32.878	1.5284	2.7933	3.1907

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	2.8197	3.2226	36.5187	−1.3653	3.7541	4.3543	38.9574	−1.2853	4.4983	5.2715
33.1057	1.2101	4.2497	4.8589	36.6187	1.0909	5.6942	6.6074	39.0574	1.0274	6.7749	7.9430
33.2057	0.9084	7.1985	8.2343	36.7187	0.8172	9.1898	10.6688	39.1574	0.7706	10.6266	12.4651
33.3057	0.6075	12.0404	13.7801	36.8187	0.5442	14.7241	17.1035	39.2574	0.5135	16.4062	19.2562
33.4057	0.3075	18.3071	20.9654	36.9187	0.2719	19.3627	22.5052	39.3574	0.2575	22.4441	26.3611
33.5057				37.0187				39.4574			
33.6057	+0.2899	18.7705	21.5145	37.1187	+0.2708	21.0055	24.4370	39.5574	+0.2528	22.7043	26.6897
33.7057	0.5875	12.7407	14.6063	37.2187	0.5411	15.0511	17.5132	39.6574	0.5072	16.8238	19.7802
33.8057	0.8841	7.7024	8.8330	37.3187	0.8108	9.4996	11.0565	39.7574	0.7609	11.0926	13.0450
33.9057	1.1800	4.6266	5.3077	37.4187	1.0797	6.0572	7.05255	39.8574	1.0139	7.0912	8.3425
34.0057	1.4809	3.0594	3.5112	37.5187	1.3480	4.0124	4.6736	39.9574	1.2664	4.7945	5.6426

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	5.2415	6.2083	44.055	−1.1395	6.3645	7.6225	46.7136	−1.0796	7.4350	9.0070
41.5642	0.9688	7.9676	9.4417	44.155	0.9104	9.4301	11.2995	46.8136	0.8628	10.8229	13.1178
41.6642	0.7265	12.2282	14.4981	44.255	0.6816	13.9686	16.7468	46.9136	0.6465	15.7367	19.0846
41.7642	0.4847	18.1582	21.5425	44.355	0.4534	20.0997	24.1135	47.0136	0.4306	21.9564	26.6463
41.8642	0.2434	24.1075	28.6210	44.455	0.2256	25.8894	31.0822	47.1136	0.2151	27.5149	33.4171
41.9642				44.555				47.2136			
42.0642	+0.2376	24.3756	28.9644	44.655	+0.2286	26.0177	31.2633	47.3136	+0.2145	27.8063	33.8008
42.1642	0.4773	18.6020	22.1070	44.755	0.4550	20.3664	24.4757	47.4136	0.4228	22.4420	27.2833
42.2642	0.7165	12.7112	15.1096	44.855	0.6809	14.3255	17.2191	47.5136	0.6426	16.1397	19.6244
42.3642	0.9552	8.4116	10.0020	44.955	0.9064	9.7622	11.7377	47.6136	0.8561	11.2231	13.6500
42.4642	1.1934	5.6073	6.6700	45.055	1.1324	6.6547	8.0043	47.7136	1.0691	7.7425	9.4201

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1042	−1.0796	13.0132	16.5698	59.6952	−0.7861	15.4598	19.8259
58.2042	0.8628	17.6024	22.4186	59.7952	0.6143	20.8415	26.7457
58.3042	0.6465	23.5599	30.0195	59.8952	0.4428	27.1833	34.9128
58.4042	0.4306	29.8317	38.0276	59.9952	0.2714	33.1220	42.5777
58.5042	0.2151	34.9048	44.5142	60.0952	0.1668	35.9253	46.2128
58.6042				60.1952			
58.7042	+0.2145	35.0444	44.7317	60.2952	+0.1727	35.9937	46.3422
58.8042	0.4228	29.9851	38.2908	60.3952	0.3432	28.7241	36.9775
58.9042	0.6426	23.8040	30.4110	60.4952	0.5133	24.9022	32.0636
59.0042	0.8561	17.8780	22.8503	60.5952	0.6832	18.9692	24.4274
59.1042	1.0691	13.3496	17.0700	60.6952	0.8528	14.1848	18.2709

(f) $C_{16}H_{14}O_3$–Polycarbonate

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	1.1169	1.1921	20.6838	−2.3610	1.9880	2.1593	21.601	−2.2635	2.2251	2.4259
16.4644	2.3630	1.5871	1.6946	20.7838	1.8846	2.8022	3.0449	21.701	1.8068	3.1593	3.4458
16.5644	1.9673	2.0904	2.2328	20.8838	1.4103	4.5725	4.9706	21.801	1.3520	5.1959	5.6695
16.6644	1.1749	5.1046	5.4547	20.9838	0.9381	9.4856	10.3164	21.901	0.8993	10.6151	11.5884
16.7644	0.5858	13.6273	14.5703	21.0838	0.4681	20.6652	22.4921	22.001	0.4583	21.3461	23.3212
16.8644				21.1838				22.101			
16.9644	+0.5821	13.9573	14.9352	21.2838	+0.4657	20.5445	22.3789	22.201	+0.4473	21.9724	24.0258
17.0644	1.1611	5.4153	5.7961	21.3838	0.9214	10.0873	10.9888	22.301	0.8923	10.9923	12.0199
17.1644	1.7368	2.7006	2.8916	21.4838	1.3910	4.8874	5.3259	22.401	1.3354	5.5427	6.0628
17.2644	2.3091	1.7706	1.8966	21.5838	1.8505	3.0404	3.3145	22.501	1.7765	3.3848	3.7038
17.3644	2.8782	1.3217	1.4164	21.6838	2.3079	2.2140	2.4146	22.601	2.2158	2.4577	2.6904

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	2.4712	2.7043	23.516	−2.0839	2.7178	2.9864	28.5936	−1.7267	4.3903	4.9262
22.6159	1.7299	3.4987	3.8303	23.616	1.6636	3.8995	4.2867	28.6936	1.3791	6.5542	7.3576
22.7159	1.2938	5.8751	6.4346	23.716	1.2448	6.5469	7.2001	28.7936	1.0326	11.0051	12.3602
22.8159	0.8595	11.7534	12.8796	23.816	0.8278	12.8972	14.1915	28.8936	0.6874	19.6825	22.1216
22.9159	0.4270	23.0997	25.3339	23.916	0.4124	24.5358	27.0215	28.9936	0.3430	32.0031	36.0086
23.0159				24.016				29.0936			
23.1159	+0.4325	23.2601	25.5310	24.116	+0.4135	24.8460	27.3861	29.1936	+0.3421	32.3680	36.4505
23.2159	0.8597	12.0600	13.2373	24.216	0.8240	13.2783	14.6350	29.2936	0.6831	20.2218	22.7661
23.3159	1.2851	6.1776	6.7827	24.316	1.2329	6.8976	7.6045	29.3936	1.0228	11.4726	12.9176
23.4159	1.7987	3.7622	4.1323	24.416	1.6401	4.1787	4.6087	29.4936	1.3616	6.9908	7.8738
23.5159	2.1306	2.6976	2.9642	24.516	2.0458	2.9638	3.2701	29.5936	1.6992	4.7648	5.3688

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	4.8703	5.4894	30.7617	−1.6128	5.2829	5.9815	31.878	−1.5598	5.8276	6.6291
29.7684	1.3276	7.3145	8.2480	30.8617	1.2889	7.9745	9.0332	31.978	1.2469	8.7315	9.9371
29.8684	0.9932	12.0686	13.6152	30.9617	0.9660	13.2911	15.0638	32.078	0.9350	14.4684	16.4754
29.9684	0.6599	21.4735	24.2445	31.0617	0.6441	22.7794	25.8379	32.178	0.6239	24.2415	27.6268
30.0684	0.3276	33.7907	38.1951	31.1617	0.3232	35.0967	39.8562	32.278	0.3138	36.6776	41.8517
30.1684				31.2617				32.378			
30.2684	+0.3338	33.8627	38.3087	31.3617	0.3157	35.7088	40.5874	32.478	0.3038	37.4223	42.7398
30.3684	0.6629	21.6906	24.5307	31.4617	0.6338	23.5016	26.7026	32.578	0.6113	25.1712	28.7359
30.4684	0.9911	12.4888	14.1251	31.5617	0.9509	13.9922	15.8984	32.678	0.9179	15.3104	17.4783
30.5684	1.3182	7.6850	8.6946	31.6617	1.2670	8.5415	9.7079	32.778	1.2236	9.3320	10.6561
30.6684	1.6444	5.1944	5.8791	31.7617	1.5882	5.6864	6.4653	32.878	1.5284	6.3364	7.2381

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	6.3898	7.3031	36.5187	−1.3653	8.4293	9.7776	38.9574	−1.2853	10.0436	11.7711
33.1057	1.2101	9.4473	10.8026	36.6187	1.0909	12.5454	14.5596	39.0574	1.0274	14.8695	17.4369
33.2057	0.9084	15.6627	17.9202	36.7187	0.8172	19.8709	23.0769	39.1574	0.7706	22.9260	26.9050
33.3057	0.6075	25.6838	29.4113	36.8187	0.5442	31.2549	36.3365	39.2574	0.5135	34.7464	40.8254
33.4057	0.3075	38.1795	43.7773	36.9187	0.2719	43.3387	50.4569	39.3574	0.2575	46.6485	54.8930
33.5057				37.0187				39.4574			
33.6057	+0.2899	39.1020	44.8761	37.1187	+0.2708	43.6517	50.8659	39.5574	+0.2528	47.1739	55.5616
33.7057	0.5875	27.1792	31.1787	37.2187	0.5411	31.9405	37.1981	39.6574	0.5072	35.6180	41.9236
33.8057	0.8841	16.7328	19.1934	37.3187	0.8108	20.5532	23.9305	39.7574	0.7609	23.9209	28.1456
33.9057	1.1800	10.2538	11.7644	37.4187	1.0797	13.3470	15.5426	39.8574	1.0139	15.5320	18.2760
34.0057	1.4809	6.9215	7.9439	37.5187	1.3480	8.9905	10.4727	39.9574	1.2664	10.6919	12.5844

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	11.6595	13.8119	44.055	−1.1395	14.0817	16.8680	46.7136	−1.0796	16.3776	19.8452
41.5642	0.9688	17.4070	20.6330	44.155	0.9104	20.5224	24.5999	46.8136	0.8628	23.4804	28.4735
41.6642	0.7265	26.3234	31.2290	44.255	0.6816	29.9965	35.9917	46.9136	0.6465	33.6572	40.8596
41.7642	0.4847	38.3749	45.5862	44.355	0.4534	42.3632	50.9041	47.0136	0.4306	46.1924	56.1668
41.8642	0.2434	50.0599	59.5625	44.455	0.2256	53.7226	64.6627	47.1136	0.2151	57.1013	69.5525
41.9642				44.555				47.2136			
42.0642	+0.2376	50.5998	60.2601	44.655	+0.2286	53.9761	65.0258	47.3136	+0.2145	57.6478	70.2841
42.1642	0.4773	39.2881	46.7546	44.755	0.4550	42.9268	51.6729	47.4136	0.4228	47.1882	57.4831
42.2642	0.7165	27.3233	32.5003	44.855	0.6809	30.7162	36.9521	47.5136	0.6426	34.5307	42.0316
42.3642	0.9552	18.3698	21.8495	44.955	0.9064	21.2377	25.5458	47.6136	0.8561	24.3385	29.6175
42.4642	1.1934	12.4515	14.8134	45.055	1.1324	14.7030	17.6883	47.7136	1.0691	17.0160	20.7085

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	28.2730	36.0337	59.6952	−0.7861	33.3765	42.8487
58.2402	0.8628	37.8347	48.2787	59.7952	0.6143	44.4931	57.2064
58.3402	0.6465	49.9817	63.8903	59.8952	0.4428	57.2411	73.7474
58.4402	0.4306	62.4335	79.9795	59.9952	0.2714	68.9078	88.9795
58.5402	0.2151	72.2613	92.7611	60.0952	0.1668	74.2927	96.0674
58.6402				60.1952			
58.7402	+0.2145	72.6083	93.2953	60.2952	+0.1727	74.4496	96.3591
58.8402	0.4228	62.7549	80.5382	60.3952	0.3432	64.9742	83.9952
58.9402	0.6426	50.4904	64.7166	60.4952	0.5133	52.7440	68.0937
59.0402	0.8561	38.4329	49.2189	60.5952	0.6832	40.6931	52.4861
59.1402	1.0691	29.0057	37.1335	60.6952	0.8528	30.7566	39.6521

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

(g) $C_{43}H_{38}O_7$–Bakelite

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	2.9206	3.1171	20.6838	−2.3610	5.1892	5.6364	21.601	−2.2635	5.8045	6.3284
16.4644	2.3630	4.1432	4.4237	20.7838	1.8846	7.2953	7.9275	21.701	1.8068	8.2275	8.9742
16.5644	1.9673	5.4447	5.8158	20.8838	1.4103	11.8899	12.9267	21.801	1.352	13.5183	14.7528
16.6644	1.1749	13.2961	14.2103	20.9838	0.9381	24.7984	26.9845	21.901	0.8993	27.7746	30.3421
16.7644	0.5858	35.8639	38.3887	21.0838	0.4681	54.5151	59.4924	22.001	0.4583	56.2988	61.6831
16.8644				21.1838				22.101			
16.9644	+0.5821	36.7349	39.3555	21.2838	+0.4657	54.1762	59.1688	22.201	+0.4473	57.9616	63.5699
17.0644	1.1611	14.1117	15.1066	21.3838	0.9214	26.3832	28.7590	22.301	0.8923	28.7640	31.4764
17.1644	1.7368	7.0261	7.5233	21.4838	1.3910	12.7112	13.8537	22.401	1.3354	14.4225	15.7787
17.2644	2.3091	4.6202	4.9491	21.5838	1.8505	7.9142	8.6283	22.501	1.7765	8.8076	9.6384
17.3644	2.8782	3.4580	3.7056	21.6838	2.3079	5.7772	6.3008	22.601	2.2158	6.4093	7.0165

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	6.4430	7.0510	23.516	−2.0839	7.0826	7.7828	28.5936	−1.7267	11.4218	12.8177
22.6159	1.7299	9.1022	9.9655	23.616	1.6636	10.1425	11.1504	28.6936	1.3791	17.0489	19.1438
22.7159	1.2938	15.2925	16.7526	23.716	1.2448	17.0460	18.7514	28.7936	1.0326	28.7247	32.2862
22.8159	0.8595	30.7707	33.7476	23.816	0.8278	33.7848	37.2134	28.8936	0.6874	51.6949	58.2443
22.9159	0.4270	60.9532	67.0727	23.916	0.4124	64.7567	71.5883	28.9936	0.3430	84.5436	95.7569
23.0159				24.016				29.0936			
23.1159	+0.4325	61.3724	67.5932	24.116	+0.4135	65.5753	72.5613	29.1936	+0.3421	85.5076	96.9471
23.2159	0.8597	31.5732	34.6865	24.216	0.8240	34.7830	38.3788	29.2936	0.6831	53.1160	59.9548
23.3159	1.2851	16.0804	17.6595	24.316	1.2329	17.9605	19.8068	29.3936	1.0228	29.9474	33.7471
23.4159	1.7987	9.7868	10.7505	24.416	1.6401	10.8677	11.9872	29.4936	1.3616	18.1869	20.4904
23.5159	2.1306	7.0321	7.7273	24.516	2.0458	7.7227	8.5212	29.5936	1.6992	12.3946	13.9677

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	12.6675	14.2797	30.7617	−1.6128	13.7379	15.5574	31.878	−1.5598	15.1544	17.2424
29.7684	1.3276	19.0350	21.4712	30.8617	1.2889	20.7556	23.5206	31.978	1.2469	22.7338	25.8849
29.8684	0.9932	31.5124	35.5846	30.9617	0.9660	34.7364	39.4133	32.078	0.9350	37.8319	43.1369
29.9684	0.6599	56.4381	63.9093	31.0617	0.6441	59.8859	68.1537	32.178	0.6239	63.7489	72.9282
30.0684	0.3276	89.2861	101.6758	31.1617	0.3232	92.7391	106.1671	32.278	0.3138	96.9282	111.5833
30.1684				31.2617				32.378			
30.2684	+0.3338	89.4685	101.9727	31.3617	+0.3157	94.3658	108.1564	32.478	+0.3038	98.9100	114.0098
30.3684	0.6629	56.9990	64.6568	31.4617	0.6338	61.7917	70.4582	32.578	0.6113	66.2061	75.8930
30.4684	0.9911	32.6149	36.9245	31.5617	0.9509	36.5769	41.6117	32.678	0.9179	40.0460	45.7849
30.5684	1.3182	19.9993	22.6351	31.6617	1.2670	22.2362	25.2844	32.778	1.2236	24.3005	27.7638
30.6684	1.6444	13.5096	15.2928	31.7617	1.5882	14.7872	16.8159	32.878	1.5284	16.4778	18.8275

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	16.6168	18.9965	36.5187	−1.3653	21.9286	25.4476	38.9574	−1.2853	26.1434	30.6602
33.1057	1.2101	24.6023	28.1476	36.6187	1.0909	32.7108	38.0010	39.0574	1.0274	38.8135	45.5808
33.2057	0.9084	40.9746	46.9541	36.7187	0.8172	52.0522	60.6065	39.1574	0.7706	60.1146	70.7936
33.3057	0.6075	67.5594	77.6970	36.8187	0.5442	82.3142	96.3190	39.2574	0.5135	91.5565	108.4502
33.4057	0.3075	100.9062	116.8194	36.9187	0.2719	144.5843	135.0986	39.3574	0.2575	123.3532	147.3187
33.5057				37.0187				39.4574			
33.6057	+0.2899	103.3633	119.8322	37.1187	+0.2708	115.4141	136.2229	39.5574	+0.2528	124.7488	149.1729
33.7057	0.5875	71.4583	82.3687	37.2187	0.5411	84.1256	98.6395	39.6574	0.5072	93.8636	111.4276
33.8057	0.8841	43.7921	50.3226	37.3187	0.8108	53.8483	62.8705	39.7574	0.7609	62.7412	74.1027
33.9057	1.1800	26.7129	30.6686	37.4187	1.0797	34.8193	40.5939	39.8574	1.0139	40.5732	47.8170
34.0057	1.4809	17.9995	20.6647	37.5187	1.3480	23.3924	27.2635	39.9574	1.2664	27.8344	32.7855

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	30.3567	35.9926	44.055	−1.1395	36.7024	44.0227	46.7136	−1.0796	42.7262	51.8662
41.5642	0.9688	45.4788	54.0155	44.155	0.9104	53.6855	64.5344	46.8136	0.8628	61.4730	74.8255
41.6642	0.7265	69.0854	82.3417	44.255	0.6816	78.7940	95.1220	46.9136	0.6465	88.4738	108.2487
41.7642	0.4847	101.1660	121.3865	44.355	0.4534	111.7364	135.9360	47.0136	0.4306	121.8840	150.4304
41.8642	0.2434	132.3927	160.2665	44.455	0.2256	142.1020	174.5204	47.1136	0.2151	151.0455	188.2750
41.9642				44.555				47.2136			
42.0642	+0.2376	133.8268	162.2154	44.655	+0.2286	142.7695	175.5335	47.3136	+0.2145	152.5003	190.3572
42.1642	0.4773	103.5863	124.5763	44.755	0.4550	113.2255	138.0411	47.4136	0.4228	124.5250	154.0786
42.2642	0.7165	71.7248	85.7441	44.855	0.6809	80.6885	97.6960	47.5136	0.6426	90.7765	111.4106
42.3642	0.9552	48.0098	57.2324	44.955	0.9064	55.5615	67.0357	47.6136	0.8561	63.7267	77.8636
42.4642	1.1934	32.4310	38.6223	45.055	1.1324	38.3319	46.1815	47.7136	1.0691	44.3871	54.1249

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	74.0074	94.8635	59.6952	−0.7861	87.4888	113.2281
58.2402	0.8628	99.3465	128.0908	59.7952	0.6143	117.0184	152.6557
58.3402	0.6465	131.6800	171.4370	59.8952	0.4428	151.0096	199.3572
58.4402	0.4306	164.9258	217.4917	59.9952	0.2714	182.1882	243.8309
58.5402	0.2151	191.2187	255.2998	60.0952	0.1668	196.6004	265.0964
58.6402				60.1952			
58.7402	+0.2145	192.1385	256.8813	60.2952	+0.1727	197.0094	265.9507
58.8402	0.4228	165.7631	219.0728	60.3952	0.3432	171.6441	229.0477
58.9402	0.6426	133.0318	173.7446	60.4952	0.5133	138.9758	183.1638
59.0402	0.8561	100.9128	130.6277	60.5952	0.6832	106.8901	139.5506
59.1402	1.0691	75.9247	97.7899	60.6952	0.8528	80.5331	104.5417

(h) $C_{55}H_{102}O_6$–Fat (Adipose tissue)

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	3.5241	3.7612	20.6838	−2.3610	6.2798	6.8211	21.601	−2.2635	7.0290	7.6636
16.4644	2.3630	5.0132	5.3526	20.7838	1.8846	8.8768	9.6463	21.701	1.8068	10.2259	11.1543
16.5644	1.9673	6.6117	7.0624	20.8838	1.4103	14.7977	16.0893	21.801	1.3520	16.9406	18.4897
16.6644	1.1749	16.9686	18.1373	20.9838	0.9381	32.7353	35.6387	21.901	0.8993	36.8813	40.3156
16.7644	0.5858	50.0007	53.5874	21.0838	0.4681	77.3488	84.6772	22.001	0.4583	80.1801	88.1498
16.8644				21.1838				22.101			
16.9644	+0.5821	51.2363	54.9632	21.2838	+0.4657	77.1191	84.4920	22.201	+0.4473	82.7091	91.0446
17.0644	1.1611	18.0512	19.3264	21.3838	0.9214	34.9171	38.0821	22.301	0.8923	38.2470	41.8815
17.1644	1.7368	8.5908	9.1990	21.4838	1.391	15.8502	17.2765	22.401	1.3354	18.1063	19.8114
17.2644	2.3091	5.5935	5.9917	21.5838	1.8505	9.6370	10.5068	22.501	1.7765	10.7524	11.7672
17.3644	2.8782	4.2980	4.6057	21.6838	2.3079	6.9944	7.6285	22.601	2.2158	7.76496	8.5007

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	7.8094	8.5464	23.516	−2.0839	8.5880	9.4373	28.5936	−1.7267	13.9693	15.6777
22.6159	1.7299	11.1336	12.1902	23.616	1.6636	12.4401	13.6771	28.6936	1.3791	21.3066	23.9289
22.7159	1.2938	19.2878	21.1324	23.716	1.2448	21.5866	23.7503	28.7936	1.0326	37.3332	41.9877
22.8159	0.8595	41.0727	45.0814	23.816	0.8278	45.2743	49.9167	28.8936	0.6874	70.8437	80.0218
22.9159	0.4270	87.2402	96.3944	23.916	0.4124	92.8849	103.1686	28.9936	0.3430	122.4940	139.9331
23.0159				24.016				29.0936			
23.1159	+0.4325	87.7758	97.0760	24.116	+0.4135	94.0550	104.5788	29.1936	+0.3421	124.0056	141.8373
23.2159	0.8597	42.1410	46.3343	24.216	0.8240	46.6423	51.5166	29.2936	0.6831	72.8461	82.4467
23.3159	1.2851	20.2910	22.2872	24.316	1.2329	22.7684	25.1141	29.3936	1.0228	38.9530	43.9247
23.4159	1.7987	11.9811	13.1615	24.416	1.6401	13.3394	14.7144	29.4936	1.3616	22.7707	25.6600
23.5159	2.1306	8.5269	9.3701	24.516	2.0458	9.3681	10.3370	29.5936	1.6992	15.1753	17.1027

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	15.5371	17.5161	30.7617	−1.6128	16.8759	19.1130	31.878	−1.5598	18.6890	21.2668
29.7684	1.3276	23.9255	26.9938	30.8617	1.2889	26.1840	29.6803	31.978	1.2469	28.7868	32.7881
29.8684	0.9932	41.1416	46.4932	30.9617	0.9662	45.5960	51.7842	32.078	0.9350	49.9527	57.0235
29.9684	0.6599	77.6946	88.2525	31.0617	0.6441	82.6915	94.4424	32.178	0.6239	88.3452	101.4812
30.0684	0.3276	129.6600	149.0900	31.1617	0.3232	134.7022	155.8360	32.278	0.3138	141.0457	164.2721
30.1684				31.2617				32.378			
30.2684	+0.3338	129.8015	149.3842	31.3617	+0.3157	137.2745	159.0706	32.478	+0.3038	144.0059	168.0212
30.3684	0.6629	78.4762	89.3016	31.4617	0.6338	85.4720	97.8323	32.578	0.6113	91.8590	105.7701
30.4684	0.9911	42.5936	48.2609	31.5617	0.9509	48.1467	54.8326	32.678	0.9179	53.0214	60.6999
30.5684	1.3182	25.1535	28.4757	31.6617	1.2670	28.1091	31.9726	32.778	1.2236	30.8282	35.2356
30.6684	1.6444	16.5822	18.7729	31.7617	1.5882	18.1943	20.6933	32.878	1.5284	20.3690	23.2772

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	20.5623	23.5109	36.5187	−1.3653	27.4431	31.8567	38.9574	−1.2853	32.9890	38.7061
33.1057	1.2101	31.2423	35.7590	36.6187	1.0909	42.0990	48.9456	39.0574	1.0274	50.4879	59.3602
33.2057	0.9084	54.3315	62.3473	36.7187	0.8172	69.8775	81.5587	39.1574	0.7706	81.2739	96.0355
33.3057	0.6075	93.8303	108.4162	36.8187	0.5442	115.6048	136.2796	39.2574	0.5135	129.2159	154.5151
33.4057	0.3075	146.8981	172.2402	36.9187	0.2719	167.5572	200.5494	39.3574	0.2575	180.7094	220.2091
33.5057				37.0187				39.4574			
33.6057	+0.2899	150.7764	177.1692	37.1187	+0.2708	168.9501	202.9017	39.5574	+0.2528	182.8612	223.2315
33.7057	0.5875	99.3832	115.1636	37.2187	0.5411	118.2219	139.7003	39.6574	0.5072	132.5886	158.9835
33.8057	0.8841	58.2729	67.0718	37.3187	0.8108	72.3057	84.6407	39.7574	0.7609	84.9511	100.7082
33.9057	1.1800	34.0746	39.1398	37.4187	1.0797	45.0216	52.5359	39.8574	1.0139	52.9233	62.4534
34.0057	1.4809	22.3126	25.6214	37.5187	1.3480	29.3680	34.2396	39.9574	1.2664	35.1858	41.4663

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	38.5217	45.7026	44.055	−1.1395	47.0810	56.5277	46.7136	−1.0796	55.2517	67.1671
41.5642	0.9688	59.6841	71.0079	44.155	0.9104	71.1566	85.7514	46.8136	0.8628	82.0421	100.2071
41.6642	0.7265	94.0463	112.6154	44.255	0.6816	108.0963	131.3277	46.9136	0.6465	122.1493	150.7033
41.7642	0.4847	143.4294	174.1655	44.355	0.4534	159.2568	196.6981	47.0136	0.4306	174.3790	219.2494
41.8642	0.2434	194.2786	240.8244	44.455	0.2256	208.9383	263.8842	47.1136	0.2151	221.9845	285.7221
41.9642				44.555				47.2136			
42.0642	+0.2376	196.4999	244.0467	44.655	+0.2286	209.8619	265.4144	47.3136	+0.2145	224.4652	289.5750
42.1642	0.4773	147.0454	179.0877	44.755	0.4550	161.3864	199.8424	47.4136	0.4228	178.3527	225.0274
42.2642	0.7165	97.8491	117.5709	44.855	0.6809	110.7476	134.9914	47.5136	0.6426	125.3633	155.2226
42.3642	0.9552	63.1432	75.4177	44.955	0.9064	73.6991	89.1605	47.6136	0.8561	85.1298	104.4039
42.4642	1.1934	41.2605	49.1737	45.055	1.1324	49.2430	59.3925	47.7136	1.0691	57.4680	70.1848

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	98.6212	127.0763	59.6952	−0.7861	117.9720	153.8735
58.2402	0.8628	135.8560	177.0404	59.7952	0.6143	162.2978	215.1229
58.3402	0.6465	185.5344	246.8065	59.8952	0.4428	215.6524	293.4886
58.4402	0.4306	238.8343	327.2877	59.9952	0.2714	266.4341	374.7284
58.5402	0.2151	282.6281	399.4589	60.0952	0.1668	290.6980	416.6412
58.6402				60.1952			
58.7402	+0.2145	283.7691	401.8165	60.2952	+0.1727	291.1869	417.9187
58.8402	0.4228	239.9444	329.6650	60.3952	0.3432	248.6893	346.1825
58.9402	0.6426	187.4451	250.2676	60.4952	0.5133	196.1214	264.8793
59.0402	0.8561	137.9441	180.5424	60.5952	0.6832	146.5813	193.8067
59.1402	1.0691	101.1820	131.0437	60.6952	0.8528	107.6181	140.5918

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

(i) $H_8O_{26}P_9Ca_6$–Bone

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	5.5307	5.9029	20.6838	−2.3610	9.5897	10.4169	21.601	−2.2635	10.6993	11.6661
16.4644	2.3630	7.6525	8.1710	20.7838	1.8846	13.2630	14.4141	21.701	1.8068	14.6766	16.0109
16.5644	1.9673	9.9511	10.6302	20.8838	1.4103	20.0548	21.8094	21.801	1.3520	22.1855	24.2194
16.6644	1.1749	20.4264	21.8361	20.9838	0.9381	33.1542	36.0958	21.901	0.8993	35.9947	39.3437
16.7644	0.5858	37.9547	40.6331	21.0838	0.4681	53.1788	58.0253	22.001	0.4583	55.8576	61.1965
16.8644				21.1838				22.101			
16.9644	+0.5821	38.7678	41.5399	21.2838	+0.4657	54.0749	59.0575	22.201	+0.4473	57.1074	62.6265
17.0644	1.1611	21.4142	22.9302	21.3838	0.9214	34.5205	37.6484	22.301	0.8923	37.1869	40.7172
17.1644	1.7368	12.5914	13.4841	21.4838	1.3910	21.2509	23.1680	22.401	1.3354	23.4994	25.7184
17.2644	2.3091	8.5263	9.1337	21.5838	1.8505	14.3614	15.6594	22.501	1.7765	15.8732	17.3737
17.3644	2.8782	6.3773	6.8341	21.6838	2.3079	10.6610	11.6282	22.601	2.2158	11.8022	12.9216

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	11.8458	12.9649	23.516	−2.0839	13.0154	14.3040	28.5936	−1.7267	20.5089	23.0226
22.6159	1.7299	16.2953	17.8444	23.616	1.6636	17.9917	19.7843	28.6936	1.3791	28.2803	31.7726
22.7159	1.2938	24.4830	26.8309	23.716	1.2448	26.8315	29.5292	28.7936	1.0326	40.6370	45.7161
22.8159	0.8595	39.0638	42.8692	23.816	0.8278	42.0248	46.3202	28.8936	0.6874	58.6256	66.1077
22.9159	0.4270	59.6772	65.6579	23.916	0.4124	63.0723	69.7103	28.9936	0.3430	80.8704	91.5362
23.0159				24.016				29.0936			
23.1159	+0.4325	60.1996	66.2916	24.116	+0.4135	63.8189	70.6008	29.1936	+0.3421	81.9781	92.8857
23.2159	0.8597	40.0884	44.0696	24.216	0.8240	43.2485	47.7527	29.2936	0.6831	60.0654	67.8567
23.3159	1.2851	25.6803	28.2141	24.316	1.2329	28.1539	31.0634	29.3936	1.0228	42.2240	47.6269
23.4159	1.7987	17.4705	19.1950	24.416	1.6401	19.2389	21.2264	29.4936	1.3616	29.9521	33.7665
23.5159	2.1306	12.9432	14.2246	24.516	2.0458	14.1494	15.6148	29.5936	1.6992	22.1028	24.9169

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	22.4639	25.3323	30.7617	−1.6128	24.2309	27.4520	31.878	−1.5598	26.3819	30.0321
29.7684	1.3276	30.8592	34.8309	30.8617	1.2889	33.2553	37.7130	31.978	1.2469	35.8090	40.8066
29.8684	0.9932	43.8482	49.5643	30.9617	0.9660	46.8753	53.2439	32.078	0.9350	50.1706	57.2737
29.9684	0.6599	62.4563	70.7791	31.0617	0.6441	65.7253	74.8591	32.178	0.6239	69.3387	79.3877
30.0684	0.3276	85.0569	96.7819	31.1617	0.3232	88.3066	101.0039	32.278	0.3138	92.1604	105.9894
30.1684				31.2617				32.378			
30.2684	+0.3338	85.3573	97.2107	31.3617	+0.3157	89.8074	102.8370	32.478	+0.3038	93.7714	107.9688
30.3684	0.6629	63.5191	72.1144	31.4617	0.6338	67.5962	77.1402	32.578	0.6113	71.4434	81.9614
30.4684	0.9911	45.1825	51.2070	31.5617	0.9509	49.0086	55.8193	32.678	0.9179	52.5750	60.1859
30.5684	1.3182	32.2253	36.4977	31.6617	1.2670	35.2614	40.1278	32.778	1.2236	37.9712	43.4232
30.6684	1.6444	23.8693	27.0313	31.7617	1.5882	25.9489	29.5240	32.878	1.5284	28.4492	32.5252

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	28.5487	32.6566	36.5187	−1.3653	35.9502	41.7570	38.9574	−1.2853	41.7509	49.0226
33.1057	1.2101	38.3151	43.8780	36.6187	1.0909	48.0913	55.9462	39.0574	1.0274	54.7995	64.4624
33.2057	0.9084	53.4629	61.3443	36.7187	0.8172	64.7421	75.5065	39.1574	0.7706	72.2041	85.1843
33.3057	0.6075	72.7898	83.7794	36.8187	0.5442	85.2521	99.8117	39.2574	0.5135	93.2622	110.5100
33.4057	0.3075	95.7570	110.7340	36.9187	0.2719	108.7119	128.9854	39.3574	0.2575	117.0769	139.5820
33.5057				37.0187				39.4574			
33.6057	+0.2899	97.9826	113.4578	37.1187	+0.2708	109.8213	129.4375	39.5574	+0.2528	118.4470	141.3892
33.7057	0.5875	77.3576	89.2553	37.2187	0.5411	86.9331	101.9864	39.6574	0.5072	95.2610	113.1205
33.8057	0.8841	56.2972	64.7816	37.3187	0.8108	66.5917	77.8826	39.7574	0.7609	74.5843	88.2529
33.9057	1.1800	40.9443	47.0574	37.4187	1.0797	50.3706	58.8112	39.8574	1.0139	56.4591	66.6551
34.0057	1.4809	30.7263	35.3001	37.5187	1.3480	38.2814	44.6616	39.9574	1.2664	44.1388	52.0590

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	47.5029	56.4076	44.055	−1.1395	54.8863	65.9595	46.7136	−1.0796	61.7409	75.1220
41.5642	0.9688	62.0683	73.8689	44.155	0.9104	70.1567	84.5327	46.8136	0.8628	78.0398	95.2474
41.6642	0.7265	80.3322	95.9305	44.255	0.6816	88.9984	107.6540	46.9136	0.6465	97.5224	119.5556
41.7642	0.4847	101.5897	121.9066	44.355	0.4534	110.6434	134.5678	47.0136	0.4306	119.3493	147.1957
41.8642	0.2434	125.6475	151.7949	44.455	0.2256	135.0656	165.4992	47.1136	0.2151	143.8206	178.8147
41.9642				44.555				47.2136			
42.0642	+0.2376	127.1396	153.7981	44.655	+0.2286	135.6862	166.4381	47.3136	+0.2145	145.0330	180.5569
42.1642	0.4773	103.7202	124.7413	44.755	0.4550	111.9546	136.4460	47.4136	0.4228	121.6579	150.4053
42.2642	0.7165	82.8464	99.2349	44.855	0.6809	90.9730	110.3741	47.5136	0.6426	99.8680	122.8187
42.3642	0.9552	64.7943	77.4085	44.955	0.9064	72.3780	87.5425	47.6136	0.8561	80.5039	98.6419
42.4642	1.1934	50.1048	59.7694	45.055	1.1324	56.9713	68.7788	47.7136	1.0691	64.0130	78.2508

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	94.5662	121.7337	59.6952	−0.7861	106.2389	138.1160
58.2402	0.8628	113.5708	146.9802	59.7952	0.6143	126.6339	165.6845
58.3402	0.6465	134.8368	175.7311	59.8952	0.4428	148.7124	196.1538
58.4402	0.4306	157.7926	207.4820	59.9952	0.2714	172.8485	230.3524
58.5402	0.2151	182.8296	243.1243	60.0952	0.1668	188.1059	252.5768
58.6402				60.1952			
58.7402	+0.2145	183.0645	243.6878	60.2952	+0.1727	188.3652	253.1915
58.8402	0.4228	159.0285	209.5923	60.3952	0.3432	164.1525	218.3489
58.9402	0.6426	136.0498	177.8668	60.4952	0.5133	141.6380	186.8485
59.0402	0.8561	115.5642	150.1836	60.5952	0.6832	121.5959	159.4193
59.1402	1.0691	97.0789	125.6030	60.6952	0.8528	101.6800	132.6281

(j) $[Ca_3(PO_4)_2]_3Ca(OH)_2$–Calcium hydroxyapatite

Mo $K\alpha$				Ag $K\alpha$				Cd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
16.3644	−2.9622	4.0384	4.3101	20.6838	−2.3610	6.6565	7.2303	21.601	−2.2635	7.3535	8.0174
16.4644	2.3630	5.3181	5.6782	20.7838	1.8846	8.8377	9.6038	21.701	1.8068	9.7994	10.6890
16.5644	1.9673	6.6757	7.1308	20.8838	1.4103	12.8178	13.9358	21.801	1.3520	14.1166	15.4060
16.6644	1.1749	12.8004	13.6803	20.9838	0.9381	20.4491	22.2477	21.901	0.8993	22.1705	24.2129
16.7644	0.5858	23.5876	25.2293	21.0838	0.4681	33.8796	36.9025	22.001	0.4583	35.7199	39.0585
16.8644				21.1838				22.101			
16.9644	+0.5821	24.0923	25.7906	21.2838	+0.4657	34.5200	37.6326	22.201	+0.4473	36.5647	40.0177
17.0644	1.1611	13.4544	14.4027	21.3838	0.9214	21.2717	23.1813	22.301	0.8923	22.9094	25.0618
17.1644	1.7368	8.2900	8.8769	21.4838	1.3910	13.5664	14.7862	22.401	1.3354	14.9329	16.3374
17.2644	2.3091	5.8861	6.3051	21.5838	1.8505	9.5471	10.4088	22.501	1.7765	10.4899	11.4798
17.3644	2.8782	4.6525	4.9857	21.6838	2.3079	7.3604	8.0277	22.601	2.2158	8.0758	8.8411

In $K\alpha$				Sn $K\alpha$				Cs $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
22.5159	−2.1698	8.0719	8.8338	23.516	−2.0839	8.8046	9.6754	28.5936	−1.7267	13.5349	15.1899
22.6159	1.7299	10.7235	11.7411	23.616	1.6636	11.7695	12.9396	28.6936	1.3791	18.0308	20.2471
22.7159	1.2938	15.5144	16.9958	23.716	1.2448	16.9392	18.6338	28.7936	1.0326	25.1898	28.3073
22.8159	0.8595	24.0139	26.3270	23.816	0.8278	25.8283	28.4352	28.8936	0.6874	36.0918	40.6044
22.9159	0.4270	38.5504	42.3213	23.916	0.4124	40.9518	45.1518	28.9936	0.3430	54.3114	61.2362
23.0159				24.016				29.0936			
23.1159	+0.4325	38.8300	42.6642	24.116	+0.4135	41.4093	45.6956	29.1936	+0.3421	55.1681	62.2602
23.2159	0.8597	24.6483	27.0677	24.216	0.8240	26.5773	29.3092	29.2936	0.6831	36.9899	41.6870
23.3159	1.2851	16.2579	17.8546	24.316	1.2329	17.7609	19.5865	29.3936	1.0228	26.1578	29.4699
23.4159	1.7987	11.4746	12.6049	24.416	1.6401	12.5734	13.8692	29.4936	1.3616	19.0714	21.4877
23.5159	2.1306	8.8245	9.6972	24.516	2.0458	9.5449	10.5322	29.5936	1.6992	14.5067	16.3488

TABLE 7. FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials in the energy region from 17.44 to 68.18 keV; scattering angle $(\theta)=90°$—Continued

Ba $K\alpha$				La $K\alpha$				Ce $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
29.6684	−1.6629	14.6992	16.5710	30.7617	−1.6128	15.7922	17.8850	31.878	−1.5598	17.1035	19.4614
29.7684	1.3276	19.5890	22.0966	30.8617	1.2889	21.0576	23.8631	31.978	1.2469	22.6118	25.7459
29.8684	0.9932	27.1230	30.6194	30.9617	0.9660	28.9370	32.8200	32.078	0.935	30.9421	35.2627
29.9684	0.6599	38.5465	43.5690	31.0617	0.6441	40.5985	46.1061	32.178	0.6239	42.9104	48.9699
30.0684	0.3276	57.6216	65.2863	31.1617	0.3232	59.8711	68.1652	32.278	0.3138	62.8102	71.8751
30.1684				31.2617				32.378			
30.2684	+0.3338	57.6188	65.3376	31.3617	+0.3157	61.1949	69.7429	32.478	+0.3038	64.2412	73.5890
30.3684	0.6629	39.1834	44.3651	31.4617	0.6338	41.7819	47.5344	32.578	0.6113	44.1927	50.5240
30.4684	0.9911	27.9319	31.6130	31.5617	0.9509	30.2621	34.4119	32.678	0.9179	32.4073	37.0291
30.5684	1.3182	20.3145	22.9921	31.6617	1.2670	22.2945	25.3508	32.778	1.2236	23.9396	27.3509
30.6684	1.6444	15.5983	17.6585	31.7617	1.5882	16.8760	19.1930	32.878	1.5284	18.3851	21.0083

Pr $K\alpha$				Sm $K\alpha$				Gd $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
33.0057	−1.5125	18.4069	21.0445	36.5187	−1.3653	22.6559	26.2925	38.9574	−1.2853	26.4320	30.9992
33.1057	1.2101	24.1585	27.6392	36.6187	1.0909	29.8254	34.6420	39.0574	1.0274	33.9677	39.8742
33.2057	0.9084	32.9431	37.7260	36.7187	0.8172	39.7763	46.2550	39.1574	0.7706	44.3629	52.1469
33.3057	0.6075	45.0765	51.6964	36.8187	0.5442	53.3581	62.1628	39.2574	0.5135	58.6713	69.1099
33.4057	0.3075	65.4734	75.3067	36.9187	0.2719	73.1803	85.5314	39.3574	0.2575	82.8263	97.9818
33.5057				37.0187				39.4574			
33.6057	+0.2899	67.6929	77.9506	37.1187	+0.2708	77.1852	90.3497	39.5574	+0.2528	84.0660	99.5567
33.7057	0.5875	47.0760	54.0911	37.2187	0.5411	54.4454	63.5453	39.6574	0.5072	59.9870	70.7926
33.8057	0.8841	34.6614	39.7989	37.3187	0.8108	40.9472	47.7426	39.7574	0.7609	45.8300	54.0170
33.9057	1.1800	25.7576	29.5702	37.4187	1.0797	31.3466	36.5358	39.8574	1.0139	35.3805	41.6786
34.0057	1.4809	19.7620	22.6899	37.5187	1.3480	24.3663	28.3997	39.9574	1.2664	27.9073	32.8716

Dy $K\alpha$				Er $K\alpha$				Yb $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
41.4642	−1.2118	29.8433	35.3826	44.055	−1.1395	34.2277	41.0460	46.7136	−1.0796	38.3926	46.5866
41.5642	0.9688	38.3061	45.4655	44.155	0.9104	43.2331	51.9093	46.8136	0.8628	48.0134	58.3422
41.6642	0.7265	49.3493	58.6621	44.255	0.6816	54.8163	65.9315	46.9136	0.6465	60.2311	73.3327
41.7642	0.4847	64.3829	76.7148	44.355	0.4534	70.8044	85.3957	47.0136	0.4306	77.0362	94.0869
41.8642	0.2434	89.6359	107.3270	44.455	0.2256	97.5172	118.2785	47.1136	0.2151	104.3755	128.2770
41.9642				44.555				47.2136			
42.0642	+0.2376	91.0944	109.2002	44.655	+0.2286	97.8171	118.7532	47.3136	+0.2145	105.4498	129.7450
42.1642	0.4773	65.9238	78.7036	44.755	0.4550	71.6693	86.6004	47.4136	0.4228	78.7057	96.3225
42.2642	0.7165	50.9385	60.7177	44.855	0.6809	56.0415	67.5899	47.5136	0.6426	61.6679	75.2928
42.3642	0.9552	39.9771	47.6183	44.955	0.9064	44.5941	53.7352	47.6136	0.8561	49.5070	60.3758
42.4642	1.1934	31.5244	37.5401	45.055	1.1324	35.6175	42.9014	47.7136	1.0691	39.4601	48.0938

Pt $K\alpha$				Au $K\alpha$			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
58.1402	−1.0796	58.2537	74.4798	59.6952	−0.7861	65.2499	84.0925
58.2402	0.8628	69.8542	89.5140	59.7952	0.6143	78.3109	101.2045
58.3402	0.6465	84.6758	108.8613	59.8952	0.4428	95.6133	124.0825
58.4402	0.4306	105.7472	136.6871	59.9952	0.2714	121.0741	158.2802
58.5402	0.2151	136.4438	178.0833	60.0952	0.1668	140.7723	185.3117
58.6402				60.1952			
58.7402	+0.2145	136.1998	177.9109	60.2952	+0.1727	140.5751	185.2075
58.8402	0.4228	106.4233	137.8325	60.3952	0.3432	110.2224	143.9016
58.9402	0.6426	85.6773	110.4673	60.4952	0.5133	89.0298	115.6751
59.0402	0.8561	71.0956	91.4492	60.5952	0.6832	75.7702	98.2240
59.1402	1.0691	59.7657	76.7697	60.6952	0.8528	62.5423	80.9286

TABLE 8. Gaussian fit of FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials at 59.54 keV for few biological materials (a.u.=atomic units); scattering angle (θ)=90°

H_2O: Water				C_2H_4: Polyethylene				$C_5H_8O_2$: Lucite			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
44.6951	−18.4206	0.0034	0.0041	44.6951	−18.4206	0.0001	0.0001	44.6951	−18.4206	0.0072	0.0086
45.6951	16.2433	0.0024	0.0029	45.6951	16.2433	0.0010	0.0012	45.6951	16.2433	0.0073	0.0088
46.6951	14.0988	0.0034	0.0041	46.6951	14.0988	0.0024	0.0029	46.6951	14.0988	0.0129	0.0156
47.6951	11.9872	0.0072	0.0087	47.6951	11.9872	0.0053	0.0064	47.6951	11.9872	0.0277	0.0337
48.6951	9.9084	0.0115	0.0140	48.6951	9.9084	0.0144	0.0176	48.6951	9.9084	0.0592	0.0723
49.6951	7.8622	0.0264	0.0324	49.6951	7.8622	0.0243	0.0298	49.6951	7.8622	0.1137	0.1395
50.6951	5.8485	0.0621	0.0765	50.6951	5.8485	0.0709	0.0874	50.6951	5.8485	0.3015	0.3715
51.6951	3.8670	0.1535	0.1900	51.6951	3.8670	0.2191	0.2712	51.6951	3.8670	0.8441	1.0448
52.6951	1.9176	0.5484	0.6818	52.6951	1.9176	0.6585	0.8186	52.6951	1.9176	2.6916	3.3462
53.6951				53.6951				53.6951			
54.6951	+1.8861	0.5988	0.7510	54.6951	+1.8861	0.7143	0.8959	54.6951	+1.8861	2.9234	3.6663
55.6951	3.7411	0.1854	0.2336	55.6951	3.7411	0.2666	0.3359	55.6951	3.7411	1.0197	1.2844
56.6951	5.5651	0.0828	0.1048	56.6951	5.5651	0.0992	0.1256	56.6951	5.5651	0.4140	0.5238
57.6951	7.3587	0.0405	0.0515	57.6951	7.3587	0.0387	0.0492	57.6951	7.3587	0.1780	0.2262

C_8H_8: Polystyrene				$C_6H_{11}NO$: Nylon				$C_{16}H_{14}O_3$: Polycarbonate			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
44.6951	−18.4206	0.0006	0.0007	44.6951	−18.4206	0.0042	0.0050	44.6951	−18.4206	0.0115	0.0138
45.6951	16.2433	0.0040	0.0048	45.6951	16.2433	0.0063	0.0076	45.6951	16.2433	0.0153	0.0185
46.6951	14.0988	0.0096	0.0117	46.6951	14.0988	0.0128	0.0155	46.6951	14.0988	0.0297	0.0359
47.6951	11.9872	0.0213	0.0259	47.6951	11.9872	0.0279	0.0339	47.6951	11.9872	0.0643	0.0782
48.6951	9.9084	0.0578	0.0706	48.6951	9.9084	0.0666	0.0814	48.6951	9.9084	0.1503	0.1836
49.6951	7.8622	0.0972	0.1192	49.6951	7.8622	0.1183	0.1451	49.6951	7.8622	0.2738	0.3360
50.6951	5.8485	0.2836	0.3496	50.6951	5.8485	0.3237	0.3989	50.6951	5.8485	0.7536	0.9288
51.6951	3.8670	0.8622	1.0672	51.6951	3.8670	0.9326	1.1544	51.6951	3.8670	2.1707	2.6868
52.6951	1.9176	2.5653	3.1891	52.6951	1.9176	2.8949	3.5990	52.6951	1.9176	6.7072	8.3387
53.6951				53.6951				53.6951			
54.6951	+1.8861	2.7771	3.4828	54.6951	+1.8861	3.1481	3.9481	54.6951	+1.8861	7.2706	9.1186
55.6951	3.7411	1.0428	1.3135	55.6951	3.7411	1.1284	1.4214	55.6951	3.7411	2.6181	3.2978
56.6951	5.5651	0.3971	0.5025	56.6951	5.5651	0.4475	0.5661	56.6951	5.5651	1.0430	1.3196
57.6951	7.3587	0.1551	0.1971	57.6951	7.3587	0.1867	0.2372	57.6951	7.3587	0.4319	0.5489

$C_{43}H_{38}O_7$: Bakelite				$C_{55}H_{102}O_6$: Fat (Adipose tissue)				$H_8O_{26}P_9Ca_6$: Bone			
Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB	Energy (keV)	P_Z (a.u.)	FWHM $J(P_Z)$	FWHM CB
44.6951	−18.4206	0.0274	0.0329	44.6951	−18.4206	0.0249	0.0299	44.6951	−18.4206	0.2455	0.2948
45.6951	16.2433	0.0386	0.0466	45.6951	16.2433	0.0422	0.0509	45.6951	16.2433	0.3016	0.3638
46.6951	14.0988	0.0761	0.0922	46.6951	14.0988	0.0872	0.1056	46.6951	14.0988	0.4863	0.5890
47.6951	11.9872	0.1651	0.2009	47.6951	11.9872	0.1899	0.2311	47.6951	11.9872	0.8618	1.0484
48.6951	9.9084	0.3917	0.4786	48.6951	9.9084	0.4670	0.5705	48.6951	9.9084	1.4296	1.7466
49.6951	7.8622	0.7078	0.8685	49.6951	7.8622	0.8271	1.0149	49.6951	7.8622	2.4445	2.9996
50.6951	5.8485	1.9595	2.4149	50.6951	5.8485	2.3229	2.8628	50.6951	5.8485	5.0773	6.2575
51.6951	3.8670	5.6751	7.0247	51.6951	3.8670	6.9118	8.5557	51.6951	3.8670	11.4431	14.1661
52.6951	1.9176	17.4644	21.7192	52.6951	1.9176	21.2283	26.4047	52.6951	1.9176	31.2678	38.9167
53.6951				53.6951				53.6951			
54.6951	+1.8861	18.9285	23.7484	54.6951	+1.8861	23.0380	28.9103	54.6951	+1.8861	34.4316	43.2422
55.6951	3.7411	6.8465	8.6245	55.6951	3.7411	8.3870	10.5653	55.6951	3.7411	13.5669	17.0928
56.6951	5.5651	2.7151	3.4351	56.6951	5.5651	3.2280	4.0840	56.6951	5.5651	6.6335	8.3930
57.6951	7.3587	1.1178	1.4205	57.6951	7.3587	1.3101	1.6648	57.6951	7.3587	2.4283	3.0858

$[Ca_3(PO_4)_2]_3\ Ca(OH)_2$: Calcium hydroxyapatite			
Energy (keV)	P_Z (a.u.)	FWHM ($J(P_Z)$	FWHM CB
44.6951	−18.4206	0.2035	0.2444
45.6951	16.2433	0.3011	30.3632
46.6951	14.0988	0.4935	0.5978
47.6951	11.9872	0.8312	1.0112

TABLE 8. Gaussian fit of FWHM of $J(P_Z)$ and FWHM of Compton broadening (CB) for biological materials at 59.54 keV for few biological materials (a.u.=atomic units); scattering angle (θ)=90°—Continued

Energy (keV)	P_Z (a.u.)	FWHM ($J(P_Z)$)	FWHM CB
48.6951	9.9084	1.4551	1.7778
49.6951	7.8622	2.1722	2.6655
50.6951	5.8485	4.2533	5.2419
51.6951	3.8670	8.8653	10.9742
52.6951	1.9176	20.8849	25.9771
53.6951			
54.6951	+1.8861	22.9714	28.8267
55.6951	3.7411	10.4198	13.1267
56.6951	5.5651	5.4435	6.8871
57.6951	7.3587	3.6795	4.6758

TABLE 9. Total and individual shell Compton scattering cross sections for single atoms in the energy region from 0.005 to 0.5 MeV using Compton profile data of Biggs *et al.*[10] and comparison with Strom and Israel values[21] and XCOM (1987)

E (MeV)	H1 $S(1)$ Total (Biggs)	Strom and Israel	XCOM	σ_{Big}/σ_{SI}	σ_{Big}/XCOM
0.0050	0.5019	0.515	0.5187	0.9750	0.9676
0.0060	0.5409	0.547	0.5503	0.9890	0.9829
0.0080	0.5801	0.582	0.5840	0.9970	0.9933
0.0100	0.6070	0.598	0.5993	1.0200	1.0128
0.0150	0.6241	0.609	0.6095	1.0200	1.0240
0.0200	0.6205	0.606	0.6068	1.0200	1.0226
0.0300	0.6014	0.592	0.5924	1.0300	1.0304
0.0400	0.5916	0.576	0.5759	1.0300	1.0273
0.0500	0.5735	0.559	0.5597	1.0300	1.0247
0.0600	0.5561	0.554	0.5444	1.0200	1.0215
0.8000	0.5243	0.516	0.5166	1.0200	1.0149
0.1000	0.4959	0.492	0.4923	1.0100	1.0073
0.1500	0.4371	0.443	0.4435	0.9870	0.9856
0.2000	0.3916	0.406	0.4064	0.9650	0.9636
0.3000	0.3250	0.353	0.3535	0.9210	0.9194
0.4000	0.2793	0.317	0.3168	0.8810	0.8816
0.5000	0.2451	0.289	0.2893	0.8480	0.8472

E (MeV)	C $1S(2)$	C $2S(2)$	C $2P(2)$	Total (Biggs)	Strom and Israel	XCOM	σ_{Big}/σ_{SI}	σ_{Big}/XCOM
0.0500	0.0790	0.9737	1.0057	2.0584	2.09	1.984	0.9849	1.0513
0.0600	0.1337	1.0487	1.0857	2.2682	2.29	2.202	0.9905	1.0287
0.0800	0.2603	1.1230	1.1396	2.5231	2.55	2.497	0.9895	1.0157
0.0100	0.3972	1.1666	1.1686	2.7325	2.74	2.697	0.9973	1.0155
0.0150	0.6605	1.2008	1.1988	3.0611	3.03	3.012	1.0103	1.0163
0.0200	0.8160	1.1949	1.1973	3.2082	3.19	3.182	1.0057	1.0123
0.0300	0.9648	1.1714	1.1714	3.3078	3.30	3.300	1.0024	1.0068
0.0400	1.0072	1.1382	1.1386	3.2841	3.30	3.296	0.9952	1.0043
0.0500	1.0170	1.1047	1.1052	3.2269	3.25	3.250	0.9929	1.0029
0.0600	1.0100	1.0722	1.0726	3.1550	3.19	3.188	0.9890	1.0022
0.0800	0.9751	1.0118	1.0121	2.9991	3.05	3.054	0.9833	1.0102
0.1000	0.9354	0.9576	0.9578	0.2859	2.92	2.924	0.9763	1.0010
0.1500	0.8359	0.8449	0.8451	0.2529	2.65	2.647	0.9532	1.0006
0.2000	0.7525	0.7570	0.7569	2.2665	2.43	2.431	0.9327	1.0003
0.3000	0.6273	0.6287	0.6289	1.8850	2.12	2.118	0.8892	0.9999
0.4000	0.5389	0.5401	0.5397	1.6188	1.90	1.899	0.8520	0.9998
0.5000	0.4735	0.4739	0.4740	1.4215	1.73	1.735	0.8217	0.9995

E (MeV)	N $1S(2)$	N $2S(2)$	N $2P(3)$	Total (Biggs)	Strom and Israel	XCOM	σ_{Big}/σ_{SI}	σ_{Big}/XCOM
0.0050	0.0284	0.9096	1.1019	2.0400	2.21	2.225	0.9231	0.9169
0.0060	0.0564	0.9904	1.5780	2.6249	2.49	2.494	1.0542	1.0525
0.0080	0.1443	1.0980	1.7095	2.9519	2.85	2.858	1.0358	1.0329
0.0100	0.2645	1.1459	1.7530	3.1635	3.09	3.093	1.0238	1.0228
0.0150	0.5428	1.1831	1.7097	3.5257	3.45	3.449	1.0219	1.0222
0.0200	0.7371	1.1949	1.7959	3.7379	3.65	3.645	1.0241	1.0255
0.0300	0.9162	1.1682	1.7572	3.8416	3.80	3.800	1.0109	1.0109
0.0400	0.9816	1.1382	1.7080	3.8378	3.81	3.811	1.0047	1.0044
0.0500	0.9951	1.1047	1.6578	3.7576	3.76	3.766	0.9994	0.9978
0.0600	0.9948	1.0722	1.6090	3.6761	3.70	3.700	0.9935	0.9935
0.8000	0.9691	1.0118	1.5182	3.4993	3.55	3.551	0.9857	0.9854
0.1000	0.9281	0.9576	1.4367	3.3225	3.40	3.403	0.9772	0.9763
0.1500	0.8325	0.8449	1.2676	2.9451	3.08	3.085	0.9562	0.9547
0.2000	0.7449	0.7570	1.1354	2.6425	2.83	2.834	0.9337	0.9324
0.3000	0.6225	0.6287	0.9433	2.1986	2.47	2.470	0.8901	0.8901
0.4000	0.5389	0.5401	0.8096	1.8887	2.21	2.215	0.8546	0.8527
0.5000	0.4735	0.4739	0.7111	1.6586	2.02	2.023	0.8211	0.8199

TABLE 9. Total and individual shell Compton scattering cross sections for single atoms in the energy region from 0.005 to 0.5 MeV using Compton profile data of Biggs *et al.*[10] and comparison with Strom and Israel values[21] and XCOM (1987)—Continued

E (MeV)	O $1S(2)$	O $2S(2)$	O $2P(4)$	Total (Biggs)	Strom and Israel	XCOM	σ_{Big}/σ_{SI}	σ_{Big}/XCOM
0.0500	0.0227	0.8110	1.8067	2.6404	2.32	2.323	1.1381	1.1366
0.0600	0.0454	0.8992	1.9061	2.8507	2.66	2.665	1.0717	1.0697
0.0800	0.1130	1.0219	2.0943	3.2292	3.14	3.139	1.0284	1.0287
0.0100	0.2024	1.1005	2.2272	3.5301	3.44	3.439	1.0262	1.0265
0.0150	0.4325	1.1504	2.3202	3.9031	3.87	3.864	1.0086	1.0101
0.0200	0.6165	1.1672	2.3497	4.1334	4.10	4.092	1.0081	1.0101
0.0300	0.8259	1.1595	2.3191	4.3045	4.29	4.286	1.0034	1.0043
0.0400	0.9154	1.1301	2.2622	4.3077	4.31	4.315	0.9995	0.9983
0.0500	0.9490	1.1008	2.1998	4.2496	4.27	4.275	0.9952	0.9941
0.0600	0.9602	1.0694	2.1374	4.1672	4.20	4.207	0.9921	0.9905
0.0800	0.9443	1.0102	2.0191	3.9736	4.04	4.044	0.9836	0.9826
0.1000	0.9142	0.9565	1.9118	3.7825	3.88	3.880	0.9749	0.9749
0.1500	0.8247	0.8445	1.6876	3.3568	3.52	3.521	0.9536	0.9534
0.2000	0.7460	0.7567	1.5121	3.0148	3.23	3.236	0.9334	0.9316
0.3000	0.6244	0.6287	1.2563	2.5094	2.82	2.821	0.8899	0.8895
0.4000	0.5375	0.5398	1.0784	2.1557	2.53	2.530	0.8521	0.8521
0.5000	0.4725	0.4740	0.9472	1.8937	2.31	2.312	0.8198	0.8191

E (MeV)	P $1S(2)$	P $2S(2)$	P $2P(6)$	P $3S(2)$	P $3P(3)$	Total	Strom and Israel	XCOM	σ_{Big}/σ_{SI}	σ_{Big}/XCOM
0.0050	0.0002	0.1016	0.9175	1.0104	1.5176	3.5473	3.53	3.538	1.0049	1.0026
0.0060	0.0007	0.1816	1.1655	1.0784	1.7229	4.1484	3.97	3.970	1.0449	1.0449
0.0080	0.0041	0.3657	1.5732	1.1446	1.7526	4.8402	4.71	4.698	1.0276	1.0303
0.0100	0.0125	0.5476	1.8862	1.1653	1.7911	5.4027	5.32	5.297	1.0155	1.0200
0.0150	0.0654	0.8218	2.4709	1.2024	1.8508	6.4113	6.35	6.342	1.0097	1.0109
0.0200	0.1571	0.9472	2.7935	1.1964	1.8437	6.9379	6.92	6.923	1.0026	1.0022
0.0300	0.3726	1.0291	3.0903	1.1719	1.8088	7.4727	7.44	7.439	1.0044	1.0045
0.0400	0.5409	1.0456	3.1536	1.1383	1.7577	7.6361	7.62	7.611	1.0021	1.0033
0.0500	0.6551	1.0403	3.1364	1.1047	1.7056	7.6421	7.65	7.637	0.9990	1.0007
0.0600	0.7242	1.0236	3.0923	1.0722	1.6561	7.5684	7.60	7.587	0.9958	0.9975
0.0800	0.7899	0.9829	2.9648	1.0118	1.5621	7.3115	7.39	7.384	0.9894	0.9902
0.1000	0.8058	0.9379	2.8308	0.9576	1.4787	7.0108	7.13	7.135	0.9833	0.9826
0.1500	0.7720	0.8344	2.5198	0.8449	1.3044	6.2755	6.53	6.531	0.9610	0.9609
0.2000	0.7150	0.7507	2.2627	0.7572	1.1683	5.6539	6.02	6.026	0.9392	0.9383
0.3000	0.6130	0.6247	1.8840	0.6287	0.8709	4.6213	5.27	5.270	0.8769	0.8769
0.4000	0.5300	0.5367	1.6182	0.5403	0.8334	4.0586	4.73	4.733	0.8581	0.8575
0.5000	0.4681	0.4718	1.4218	0.4739	0.7320	3.5676	4.32	4.328	0.8258	0.8243

E (MeV)	Ca $1S(2)$	Ca $2S(2)$	Ca $2P(6)$	Ca $3S(2)$	Ca $3P(6)$	Ca $4S(2)$	Total (Biggs)	Strom and Israel	XCOM	σ_{Big}/σ_{SI}	σ_{Big}/XCOM
0.0050	7.8E−06	0.0286	0.2805	0.6047	2.1806	0.8948	3.9892	4.53	4.522	0.8806	0.8822
0.0060	2.9E−05	0.0425	0.4515	0.7407	2.4923	1.0046	4.7316	5.14	5.139	0.9206	0.9207
0.0080	2.8E−04	0.1052	0.7900	0.8934	2.8845	1.1123	5.7857	6.12	6.105	0.9454	0.9477
0.0100	0.0013	0.2122	1.0870	0.9972	3.1204	1.1588	6.5589	6.83	6.814	0.9603	0.9626
0.0150	0.0128	0.5130	1.6963	1.0999	3.3635	1.1919	7.8774	8.05	8.028	0.9786	0.9812
0.0200	0.0458	0.7224	2.1169	1.1306	3.4373	1.1982	8.6512	8.82	8.801	0.9809	0.9830
0.0300	0.1685	0.8998	2.6256	1.1423	3.4409	1.1781	9.4552	9.59	9.576	0.9859	0.9874
0.0400	0.3174	0.9633	2.8418	1.1173	3.3664	1.1423	9.7485	9.87	9.853	0.9877	0.9894
0.0500	0.4439	0.9798	2.9123	1.0943	3.2799	1.1095	9.8197	9.94	9.922	0.9897	0.9897
0.0600	0.5396	0.9801	2.9310	1.0642	3.1960	1.0761	9.7870	9.91	9.889	0.9876	0.9897
0.0800	0.6543	0.9574	2.8688	1.0067	3.0231	1.0146	9.5249	9.69	9.677	0.9830	0.9843
0.1000	0.7047	0.9214	2.7600	0.9550	2.8646	0.9604	9.1661	9.39	9.388	0.9762	0.9764
0.1500	0.7189	0.8289	2.4866	0.8438	2.5308	0.8456	8.2566	8.64	8.641	0.9556	0.9555
0.2000	0.6829	0.7478	2.2462	0.7563	2.2686	0.7602	0.7420	7.99	7.994	0.9339	0.9335
0.3000	0.5961	0.6256	1.8768	0.6286	1.8853	0.6275	6.2399	7.00	7.007	0.8914	0.8905
0.4000	0.5216	0.5378	1.6159	0.5397	1.6184	0.5420	5.3754	6.30	6.299	0.8532	0.8534
0.5000	0.4629	0.4734	1.4204	0.4740	1.4217	0.4724	4.7248	5.76	5.763	0.8203	0.8199