

FINAL REPORT ON ATOMIC ABSORPTION HARMONIZATION

1.- INTRODUCTION

In consideration of the activities towards chemical measurement harmonization developed by various INTI Centres, the Quality and Environment Management encouraged this harmonization for the purposes of ensuring consistent results in the measurements performed by different Technical Units at the Institute. This process operation has been stated in DP 07 “Harmonization of Measurement, Calibration and Test Procedures,” revision 1.

Quality and Environment Manager Dr. Hector Laiz, established the priorities to define the subjects for the chemical measurement harmonization process:

- 1° - Those measurements which INTI has stated as CMCs and are performed by more than one Centre.
- 2° - Those measurements that fall on a regulated area (e.g.: food, a subject that has been raised as a proposal and as a need by several Centres).
- 3° - Those measurements which belong in strategic plan lines, e.g. environment, health, etc.

A number of meetings were held to this end, which were attended by Centre Directors and Technical Heads of areas performing measurements using flame atomic absorption spectrometry: Chemistry, Concepcion del Uruguay, Cordoba, Mendoza and Rosario. At one such meeting, Lic. Liliana Valiente was appointed as atomic absorption harmonization coordinator, since INTI-Chemistry is the Centre that has this as stated CMC.

Lic. Liliana Valiente proposed starting with flame atomic absorption spectrometry of water samples and making an inter-laboratory comparison using a synthetic sample containing calcium, magnesium, potassium, iron and zinc.

It was also decided that at the end of this process, internal crossed audits would be performed, which took place in May 2012.

2.- INTER-LABORATORY COMPARISON

The inter-laboratory comparison between the involved Centres was completed in accordance with the time schedule devised in the programming meetings. Participating laboratories were Concepcion del Uruguay, Cordoba, Mendoza, Chemistry and Rosario, i.e. all those which measure water samples by atomic absorption.

The distributed sample, a synthetic solution containing calcium, magnesium, potassium, iron and zinc, was prepared by the INTI-Chemistry Centre's Chemical Metrology Program. A control sample and a reference value with its associated uncertainty were also provided.

The result of this inter-laboratory comparison was deemed very good, as all involved laboratories satisfactorily concurred, according to the parameters used for the evaluation, based on international standards (See attached report).

3.- CROSSED AUDITS

Crossed audits between Centres in Concepcion del Uruguay, Cordoba, Mendoza and Rosario were performed by INTI-Chemistry personnel. The purpose of the audits was to evaluate ISO 17025:2005 standard due implementation in its technical aspects (section 5 of the Standard) and certain management issues that horizontally apply to measurement execution (Document Control, Procurement, Agreement Review and Record Control) for the determination of Ca, Mg, K, Fe and Zn in water, by flame AAS.

In all cases, the audit was conducted by an auditor with expertise in the atomic absorption technique and an auditor evaluating certain management issues and other considerations on personnel training and qualifications.

The times and auditors involved were as follows:

- INTI-Cordoba: 8 May 2012 – auditors: Lic. Marisa Delbon and Lic. Mabel Puelles
- INTI-Rosario: 9 May 2012 – auditors: Lic. Pablo Alvarez and Lic. Lorena Iribarren
- INTI-Mendoza: 15 May 2012 – auditors: Lic. Marisa Delbon and Lic. Mabel Puelles
- INTI-Concepcion del Uruguay: 21 May 2012 – auditors: Lic. Marisa Delbon and Lic. Lorena Iribarren

Overall, only minor findings were spotted, that by no means compromised the quality of the results issued. The audit reports are attached to this general report.

A significant aspect of the crossed audits was the evaluation of uncertainty calculations for the pertinent analyte measurements. To this respect, Centres were requested to send their own uncertainty calculations to the auditors in advance, which were then assessed by Lic. Pablo Alvarez. By and large, calculations were correct and only a few comments sent by e-mail before the audits were in point. The correctness of those findings was then verified during the audits. Annex II of the inter-laboratory comparison report shows that the calculated uncertainties are of a magnitude that can likely be expected from this type of measurements.

4.- CONCLUSIONS

Based on the results of the crossed audits and the report on the inter-laboratory comparison between the involved Centres, this harmonization process can be considered a very successful one.

Lic. Liliana Valiente
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