Harmonized Protocol for the Proficiency Testing of Sampling of Environmental Matrices

If the measurement result is used to assess the properties and the characteristics of a wider batch of material, or a contaminated soil area, from which the samples analyzed are collected and prepared, the measurement process will include sampling, any sample preparation steps, and the analysis. When sampling is part of the measurement process, it should also be part of a general scheme of quality assurance (QA) within a laboratory. To this end, the external quality-control activities, commonly pursued by carrying out PTs, should be aimed also to give an external and independent assessment of the samplers' (operators') performances.

The IUPAC International Harmonized Protocol for the Proficiency Testing of Analytical Laboratories (M. Thompson et al., *Pure Appl. Chem.*, vol. 78, no. 1, pp. 145–196, 2006), updating a previous version of the protocol, is strictly focused on the analytical part of a chemical measurement process. This protocol, as well as other international references establishing guidance on this issue for wider fields of application, does not consider the sampling phase anyway.

Recent experiences on intercomparison exercise and collaborative trials on soil sampling suggest the need for a better definition of harmonized protocol for carrying out such activities. Scopes, fields of application, terminology, scheme, structure, organization, logistic aspects, and the fundamental tools for performing this kind of exercise should be discussed in the project and defined by the envisaged protocol.

Equivalence and/or analogies between reference materials (routinely distributed among the laboratories within chemical PTs schemes) and references used for sampling (soil reference sampling, reference sampling target, etc.) have even been debated in the past years. Moreover, these aspects also involve the requirements of such references to be properly used in sampling PTs.

Starting from the experience on soil sampling intercomparison exercise, the project will

1. generate general guidance for carrying out proficiency testing on sampling, and for integrating the protocols already published on proficiency testing for chemical analyses
2. include a simple example of application (where possible)

The protocol should indicate and tackle, for example, the following items:

- scope and field of application
- terminology to be used
- critical issues in the organization and design of PT on sampling
- requirements requested for the reference (assigned) values
- methods to be applied for performance assessment
- consideration of the interpretation of the results of the PT and the quality of the information obtained

The protocol will help the worldwide harmonization of comprehensive QA schemes, including proficiency testing on environmental sampling for specified matrices.

For more information, contact Task Group Chair Paolo de Zorzi <paolo.dezorzi@isprambiente.it>.

www.iupac.org/web/ins/2009-010-3-500

Chlorine-Free Syntheses for Green Chemistry (PAC special topic issue)

Because of their peculiar characteristics, halogens are widely used by all sectors of the chemical industry to produce solvents, catalysts, building blocks, additives, and drugs. In addition, halogens are contained in several commodities that we all use daily (e.g., chlorine is contained in PVC, one of the most widely used plastic materials). More than 20 million tonnes of chlorine and coproducts caustic soda and hydrogen are produced each year at about 80 plants across Europe, mostly (about 95 percent) via electrolysis-based techniques (chlor-alkali industry); the sector directly employs about 40 000 people in 20 countries (data: www.eurochlor.org).

Since the Industrial Revolution, the halogen chlorine has been "an iconic molecule" for industrial chemical production. Even though its production by the electrolysis of sodium chloride is really energy intensive, it still is used, since it allows the manufacture of chlorinated derivatives in a very easy way, because of its high energy and reactivity; for example, $AlCl_3$, $SnCl_4$, $TiCl_4$, $SiCl_4$, $ZnCl_2$, PCl_3, PCl_5, $POCl_3$, $COCl_2$, etc.

Thus, chlorinated derivatives have many applications. Examples of their use include plastics, solvents for dry cleaning and metal degreasing, textiles, agrochemicals and pharmaceuticals, insecticides, dyestuffs, household cleaning products, and disinfectants. Chlorine is used extensively in organic and inorganic chemistry as an oxidizing agent and as a leaving group in substitution and elimination reactions. In addition, chlorine compounds find use as intermediates in the production of a number of important commercial products that do not contain chlorine. Examples include polycarbonates, polyurethanes, silicones, polytetrafluoroethylene, carboxymethyl cellulose, and propylene oxide. Through a chain of chemical derivatives and relatively easily made compounds and intermediates, such molecules have utilized the intrinsic energy available through the use of chlorine primarily produced via electrolysis.

The substitution of compounds where "chlorine is used in the making" means that we will avoid such a primary energetic source; this, however, makes chemistry "without chlorine" considerably more difficult and illustrates why it has not been adopted before. The environmental constraints and the growing need for efficient energy usage force us to take advantage of available high technologies to develop a new chemical strategy. Because of the negative impacts of chlorine and other halogens on global environment and health (e.g., toxicity and ecotoxicity, ozone layer depletion, energy consumption, and climate change, etc.), significant contributions to alternative solutions may be provided by research devoted to the systematic substitution of halogens (whenever feasible), which adopt a holistic and proactive approach. The substitution of halogens requires a look at the whole picture, rather than approaching the problem through one elemental aspect of halogen usage at a time.

This special issue of the IUPAC journal *Pure and Applied Chemistry* (*PAC*) intends to contribute to these aims, and deals with the following topics: chlorine-free reagents, chlorine-free catalysts, phosgene replacement, chlorine-free solvents, thionyl chloride substitution, and metrics for chlorine-free reactions.

www.iupac.org/web/ins/2008-016-1-300

Provisional Recommendations

Provisional Recommendations are drafts of IUPAC recommendations on terminology, nomenclature, and symbols made widely available to allow interested parties to comment before the recommendations are finally revised and published in Pure and Applied Chemistry. Full text is available online.

Definitions of Terms Relating to Crystalline Polymers

The recommendations in this document concern the terminology relating to the structure of crystalline polymers and the processes of polymer crystallization. This document is a revision and expansion of IUPAC recommendations with the same title, published in 1989, *Pure Appl. Chem.*, vol. 61, no. 4, pp. 769–785.

Comments by 31 May 2011

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http://media.iupac.org/reports/provisional/abstract11/allegra_31052011.html

Terminology for Biorelated Polymers and Applications

The aim of the following recommendation is to provide a standard terminology that can be used across all fields of science involved with biorelated polymers, namely medicine, surgery, pharmacology, agriculture, packaging, biotechnology, and polymer waste management.

Comments by 31 May 2011

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http://media.iupac.org/reports/provisional/abstract11/vert_31052011.html