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tition will continue the goal of the IChO in promoting the international exchange of pedagogical and scientific experiences in chemistry, while stimulating student interest in chemistry through independent and creative solving of chemical problems. It was truly an honor for the United States to host the 44th IChO, an experience that enhanced friendly interactions among young people with a passion and talent for chemistry and encouraged cooperation through international understanding.

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 www.icho2012.org

On the Description of Nanomaterials

by *Françoise Roure and John Rumble*

At the request of several groups involved in preparing standards for nanotechnology, the International Council for Science (ICSU) and CODATA organized a workshop addressing issues associated with developing systems for describing materials on the nanoscale (called nanomaterials for short).

The subject of describing nanomaterials is of great importance as nanotechnology progresses and becomes commercialized. Many recognized systems exist for naming and describing “traditional” materials—from chemicals to metals and alloys to polymers to biological species. The distinctive characteristics of nanomaterials and the broad interest in them, from researchers to regulators to the general public, makes it imperative to develop a robust system to describe them accurately—meaning a system that will allow complete specification of each unique nanomaterial as well as determination that two nanomaterials are the same (equivalency).

The **ICSU-CODATA workshop** was held on 23–24 February 2012 in Paris, with additional local support from the French government. Attendees included 51 representatives of 10 international scientific unions, the ISO Technical Committee 229 on Nanotechnology, industry, government, and academia, national standards development organizations, and the OECD.

Major Conclusions

1. The workshop reinforced the fact that materials with dimensions on the nanoscale (approx-

mately 1 nm to 100 nm) have structure, properties, and interactions that can be quite different from macroscopic materials.

2. Materials on the nanoscale are of interest to and involve many diverse scientific disciplines, with each discipline bringing many perspectives, some of which are unique to their discipline.
3. A wide variety of applications and technologies will take advantage of materials on the nanoscale in the future and these diverse uses will require different types and amounts of data.
4. Standards for describing materials on the nanoscale must be developed with the inclusion of perspectives from different scientific disciplines and different user communities.

The workshop acknowledged a shared interest across disciplines and user communities for accessing and using information about materials on the nanoscale. It strongly supported the position that a discipline-independent description system was necessary as an enabler for many purposes, including informed interactions and decisions among and by stakeholders communities that must be based on meaningful scientific knowledge. Such a system would allow responsible research and innovation in novel materials in many areas, including bio-nano engineered materials.

The workshop pointed out the negative consequences of a “business as usual” scenario, in which the development of a nanomaterials description system proceeds almost exclusively emphasizing only environmental, health, and safety (EHS) uses. In that scenario, the needs of other scientific disciplines and user communities would not be met in a timely fashion.

Consequently, the workshop defined some principles for guiding the development of a robust and high impact description system. Such a project should have:

- a well-defined governance for a project open to international cooperation researchers in many disciplines, perhaps through crowd sourcing
- consideration of multi-lingual needs
- early inclusion of general public and consumer needs
- early inclusion of engineering and technological needs
- early inclusion of public authority needs

The resulting system should possess the following characteristics:

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- establishment of the uniqueness of a specific nanomaterial and equivalency of two nanomaterials
- accessibility and extensions to meet specific needs or those of interest groups
- open access of the core characterization set, generic ontologies, and data sets for use by all
- interoperable informatic formats
- strong curation and high scientific quality
- capability to respond to and include new knowledge and technology, that is, be dynamic
- provision of a level playing field by international cooperation in research on nanometrology

Recommendations

The workshop strongly endorsed a vigorous effort to facilitate the development of a robust description system for materials on the nanoscale. To this end, the workshop made the following recommendations:

1. A two-phase, pre-normative project should be started as soon as possible. The first phase is to determine the requirements for a description system for materials on the nanoscale that takes into account the needs of as many scientific and technical disciplines and user communities as possible.
2. The second phase would develop a potential list of minimum characteristics that meet as many of the requirements defined in 1 above as possible.
3. The International Scientific Unions, and similar bodies for disciplines without an union, provide an ideal mechanism for bringing together the scientific knowledge necessary to complete the projects in points 1 and 2 successfully.
4. The results of these projects should be presented to international standards development organizations such as ISO TC229 on Nanotechnology to facilitate the development of standards on description systems for materials on the nanoscale.
5. CODATA as an official ICSU committee is ideally placed to bring together different scientific knowledge through its access to International Scientific Unions.
6. VAMAS (Versailles Project on Advanced Materials and Standards), has ties to international standards development organizations such as ISO, and is ideally placed to provide strong leadership on pre-normalization research.
7. Consequently, CODATA and VAMAS should form a joint working group with the specific

goal of developing a pre-normative White Paper presenting the requirements for a robust description system for materials at the nanoscale based on the needs of all scientific and technical disciplines on an international and multi-lingual basis.

8. The joint CODATA-VAMAS working group should seek funding from a variety of international and national funding agencies, as well as consider partial funding from industry.
9. Work should commence as soon as approval from CODATA and VAMAS is obtained.

The agenda of the meeting is available at <www.codata.org/Nanomaterials/Index-agenda-Nanomaterial.html>.

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 www.codata.org

What's in a Name? Possibly Death and Taxes!

*by Richard M. Hartshorn
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"In this world nothing can be said to be certain, except death and taxes."

—Benjamin Franklin, 13 November 1789

It may appear something of a leap from this statement to nomenclature, but nomenclature can be tied to both of Benjamin Franklin's certainties . . . In the absence of nomenclature, the inability to identify a compound and consequently to find and examine material safety data sheets could lead to an accident, or perhaps prevent selection of appropriate treatment or clean-up procedures in the event of a mishap.

Alternatively, having an appropriate name for a compound can be vital to taxation and application of duties. Without a name it is impossible to decide whether a duty should be applied and at what level it might be appropriate (e.g., for a pharmaceutical or a commercial commodity). An extra complication in this case is one of language—different names are used in different languages, and means must be available for translation. This was developed in the article "Customs, Chemistry, and IUPAC: An Old Story" (March-April 2009 *CI*).