ANSI-NSP Newsletter

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The ANSI-NSP Newsletter provides information on nanotechnology standards and related topics of interest. Stakeholders are encouraged to submit information to the ANSI-NSP that they feel would be of interest to the larger ANSI-NSP Community.

While ANSI will be providing some of the content to be included in this newsletter, this is to be a community-driven project, with developers and organizations providing updates on any documents published or upcoming meetings that may be of interest to the ANSI-NSP. If you do have any information you would like to share, please feel free to forward it to hbenko@ansi.org.

For further information and updates on the Panel, please visit the ANSI-NSP Website.

www.ansi.org/wsweek

WELCOME

As seen by the recent request from the OSTP for Nanotechnology-Inspired Grand Challenges for the Next Decade, nanotechnology is still big news. Standards can play an important role in this space by facilitating effective communication between not only decision makers such as regulatory agencies and business leaders, but also various scientific disciplines and the public sector.

ANSI's Nanotechnology Standards Panel (ANSI-NSP) was established in 2004 at the behest of then OSTP Director John Marburger, who noted that: "As new materials, structures, devices and systems are developed that derive their properties and function due to their nanoscale dimensions it will become increasingly important to the researchers, manufacturers, regulators and other stakeholders to have an agreed upon nomenclature with which to communicate."

As Guest Columnist Martha Marrapese's piece below highlights, nanotechnology terminology standards can foster communication between businesses and regulators by establishing a common lexicon. We support and applaud the efforts of the various standardization organizations that are developing documents which are of benefit to the overall nanotechnology community.

GUEST COLUMNIST: Martha Marrapese

ISO/TC 229 Standards Can Help EPA Regulate Nanotechnology

By Martha Marrapese, Keller and Heckman LLP[1]

Among the life and death struggles in *National Geographic's* Great Migrations series, the story of the monarch butterfly captures the imagination. It takes five entire *generations* of these butterflies to make the annual trip from Canada to the Oyamel forest in Mexico and back. In relative terms, it's like a journey begun by our great-great grandparents.

Chief among their challenges is declining milkweed habitat, upon which monarch breeding depends. According to a report in *Science*[2], our success eradicating milkweed is one reason why the number of migrating monarchs has hit an all-time low. In response, Americans are planting milkweed gardens. The milkweed species that is being widely planted in the southern United States, *Asclepias curassavica*, doesn't die back in the winter like native milkweed does. It provides a year-round habitat for the monarchs to lay their eggs, so it eliminates their need to return to Mexico. This paradise comes at a price: milkweed hosts parasites that weaken the monarchs. Monarchs that stay stateside for the winter are 5 to 9 times more likely to be infected with parasites than migrating butterflies.[3] As it turns out, native milkweed and their standard migration pattern is essential to prevent too many sick monarchs from passing parasites on to successive generations.

What do lessons from the North American migration pattern of a butterfly have to do with nanomaterials? In general, standardized approaches foster predictable and healthy business and regulatory patterns. As a practical matter, government agencies are drawing from the information in standards developed by ISO Technical Committee 229 on Nanotechnologies to develop a coordinated regulatory approach for nanomaterials in the US and Canada. ISO/TC 229 standards are the result of ten years of public-private consultation at the international level. ANSI is a vital contributor to this important body of work through the administration of Working Group 3 for the Health, Safety and Environmental Aspects of Nanotechnologies. ISO/TC 229 guidelines on physicochemical characterization and

[1] Ms. Marrapese is the immediate past Chair of the Pesticide, Chemical Regulation and Right-to-Know Committee (PCRRTK) of the American Bar Association (ABA) Section on Energy, Environment and Resources (SEER). Through SEER, under Ms. Marrapese's leadership PCRRTK issued a series of legal briefing papers on TSCA Reform. A recipient of the American National Standards Institute (ANSI), Next Generation Leadership and Service Award, Ms. Marrapese served as a U.S. delegate to the International Standards Organization (ISO) TC-229 Committee on Nanotechnologies from 2005-2013 and chaired Working Group 1 Nomenclature and Terminology, for the U.S. Technical Advisory Group (TAG) to TC-229.
[2] January 13, 2015, http://news.sciencemag.org/biology/2015/01/plan-save-monarch-butterflies-backfires.
[3] Dara A. Satterfield, John C. Maerz, Sonia Altizer. Loss of migratory behaviour increases infection risk for a butterfly host. http://rspb.royalsocietypublishing.org/content/282/1801/20141734.

characterization of dispersion stability (ISO/TR 13014:2012 and ISO/TR 13097:2013, respectively) have been referenced by USEPA. These guidelines, together with related protocol development efforts by the Organization for Economic Cooperation and Development (OECD), will help generate reliable physical-chemical data in due course.

A common system for naming nanomaterials, particularly carbon nanotubes facilitates market understanding and therefore is desirable for their commercialization. ISO's Technical Report on Nomenclature for Nanomaterials (ISO/TR 14786:2013) evaluates needs in this area and make specific recommendations. It is a launching point for public-private partnerships in this area. In addition, tools for businesses are provided to characterize the potential risks associated with commercial materials in ISO/TC 13121:2013. ISO's consensus vocabulary also is being consulted and is fostering mutual understanding. As noted in the definitions of nanoscale and nanotechnology (TS 80004-2) with respect to the length range from approximately 1 nm to 100 nm, properties that are *not* extrapolations from a larger size are predominantly exhibited in this size range. As typically noted by ISO, for such properties the size limits are considered approximate. Nevertheless, the point remains that the defining properties of interest associated with nanomaterials are size- and structure-dependent, and distinct from those associated with individual atoms or molecules or with bulk materials.

Overall, the consensus standards developed for nanotechnologies are helping to ensure that information provided by stakeholders, and resulting regulatory policies, are a good fit with the technology for generations to come.

NEWS & INFORMATION

IEC TC 113 Anticipates Publications for Nano-electrotechnology Standardization

IEC TC 113 is anticipating the publication of the following IEC Technical Specifications. All IEC documents are available for purchase via ANSI's Webstore:

IEC/TS 62844 Ed. 1, *Guidelines for quality and risk assessment for nano-enabled electrotechnical products*

IEC/TS 62607-3-2 Ed. 1, *Nanomanufacturing - Key control characteristics - Part 3-2: Luminescent nanoparticles - Determination of mass of quantum dot dispersion*

IEC/TS 62607-4-1 Ed. 2, *Nanomanufacturing - Key control characteristics - Part 4-1: Cathode nanomaterials for lithium ion batteries - Electrochemical characterisation, 2-electrode cell method*

IEC/TS 62607-4-3 Ed. 1, *Nanomanufacturing - Key control characteristics - Part 4-3: Nano-enabled electrical energy storage - Contact and coating resistivity measurements for nanomaterials*

ISO/TC 229 Publication of Revised Terminology for Nano-Objects

ISO recently published a revision of the first document to come out of ISO/TC 229: *Nanotechnologies – Vocabulary – Part 2: Nano-objects*.

Previously published as ISO/TS 27687: *Nanotechnologies – Terms and definitions for nano-*

objects: Nanoparticle, nanofibre and nanoplate, this document establishes definitions for those terms relative to particles with nanoscale dimensions. Key terms defined in this ISO TS include: nanoscale; nano-object; primary particle; constituent particle; core-shell particle.

Definitions for the terms in this Technical Specification, including those noted above, can be reviewed using the ISO Online Browsing Platform (https://www.iso.org/obp/ui/).

The American National Standards Institute's Nanotechnology Standards Panel (ANSI-NSP) serves as the cross-sector coordinating body for the purposes of facilitating the development of standards in the area of nanotechnology, including, but not limited to: nomenclature/terminology; health, safety and environmental aspects; materials properties; and testing, measurement, and characterization procedures.

For more information about the NSP, please contact hbenko@ansi.org