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 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.

WELCOME

Participation from all relevant parties directly impacted by voluntary consensus standards is integral to ensuring the development of well-balanced and comprehensive documents. Nanotechnology standards is no exception to this rule. Input from groups such as consumer organizations and other NGOs is not only welcome, but necessary as such experts provide unique perspectives and insight that is different from a researcher or industry participant.

Our guest columnist this issue provides such a perspective. As a nanotoxicologist representing the People for the Ethical Treatment of Animals (PETA), Dr. Sharma focuses on the utilization of test methods that limits the impact on animals and the environment. She is one of the many voices providing thoughtful and science-based perspectives to establish robust and well-validated test methods and guidelines for nanomaterials.

GUEST COLUMNIST: Monita Sharma, Ph.D.

The importance of standards in nanotoxicology
By Monita Sharma, Ph.D

In the field of nanotechnology, novel products and materials are being developed at a fast pace. Safe incorporation of nanomaterials into consumer products requires an understanding of nanomaterial properties and of the methods that can be used to test those materials for their effects on human health and the environment. A decade of nanomaterial research has shown that robust *in vitro* methods are critical to assess the large numbers and functionalizations of nanomaterials in a timely manner, and standardized protocols are necessary for generating high-quality, reproducible data.

Several committees, including the International Organization for Standardization's (ISO) Technical Committee (TC) 229 on Nanotechnologies, ASTM International's Committee E56 (Nanotechnology), the Organisation for Economic Co-operation and Development's (OECD) Working Party on Manufactured Nanomaterials (WPMN), and the International Electrotechnical Commission Technical Committee 113, address the need for standards and guidance documents for testing nanomaterials. These organizations provide an opportunity for scientists from different sectors and disciplines to contribute their expertise to the development of standards. Such collaborations play a pivotal role in internationally harmonizing nanomaterial testing.

Participating in the standards-development process helps me to fulfill the goal of my organization to promote the development and global implementation of robust, reliable, human-relevant nonanimal test methods. For example, my membership on the ISO Technical Advisory Group to ISO/TC 229 Nanotechnologies provided the opportunity to identify the need for and lead the development of a standard on *in vitro* methods to assess inhalation toxicity. Leading the development of this standard is particularly relevant to my expertise as I co-organized a workshop last year on the development of *in vitro* systems to assess inhalation toxicity. The development of this and similar standard methods and approaches is important to my organization because it leads to the generation of reproducible data that enables inter-laboratory comparison of results, thereby increasing the confidence in the methods and aiding in a better understanding of nanomaterial effects. Furthermore, regulatory decision-making based on data generated using globally accepted standards can reduce the cost, labor, and animal use associated with a requirement to repeat testing in different geographical regions.

Dr. Sharma received her doctorate in Biomedical Sciences with a focus on Nanotoxicology from Wright State University in 2013. Her thesis project, conducted in collaboration with Wright Patterson Air Force Base, focused on characterization and toxicity testing of nanomaterials. As the Nanotoxicology Specialist at PETA US (a member of the PETA International Science Consortium Ltd. (www.piscltd.org.uk)), she researches and promotes human-relevant nonanimal methods to assess nanotoxicity. Dr. Sharma is a member of the ANSI-Accredited Technical Advisory Group to the International Organization for Standardization (ISO) on Nanotechnology (TAG 229); participates on the OECD Working Party for Manufactured Nanomaterials (WPMN); and is involved in writing/leading standards and guidelines for nanomaterial testing. She co-organized an international workshop that focused on generating recommendations on the design of an *in vitro* system to assess the inhalation toxicity of nanomaterials, and co-manages that project. She is a member of the Society of Toxicology and the author of several nano-related publications (including peer-reviewed articles, editorials, and book chapters).

NEWS & INFORMATION

ASTM E56 Committee on Nanotechnology

ASTM Committee E56 Leadership Update

In December 2015, ASTM Committee E56 on Nanotechnology held the required biennial election of officers. A slate of officers was selected by the E56 Nominating Committee, approved at the November E56 Main Committee Meeting, and sent out for voting by the entire E56 committee. As a result of the December ballot, the elected Committee E56 officers for the 2016- 2017 term are:

Chairman: Stacey Harper, Oregon State University
Vice-Chairman: Debbie Kaiser, National Institute of Standards & Technology
Membership Secretary: Aleksandr Stefaniak, National Institute for Occupational Safety and Health
Secretary: Tony Thornton, Micromeritics
Member-At-Large: Nicolas Joy, A2LA
Member-At-Large: Lawrence Murphy, Cabot Corporation, Inc.
Member-At-Large: Anil Patri, U.S. Food and Drug Administration
Member-At-Large: Ryan Spray, Exponent
Member-At-Large: Katherine Tyner, U.S. Food and Drug Administration
Member-At-Large: Shan Zou, National Research Council Canada

During the November Committee E56 meeting in Tampa, committee members presented outgoing Chairman Debbie Kaiser with an Award of Appreciation for her 6 years of service as E56 Chairman. The committee is thankful for Debbie's leadership, dedication, and enthusiasm for nanotechnology standards development. Throughout her years as Chairman, Debbie has enthusiastically promoted the work of Committee E56, encouraging new memberships and liaisons to the committee, and championing the use of E56 standards. We look forward to continuing to benefit from Debbie's leadership and expertise as the committee's Vice-Chairman.

For more information on Committee E56 on Nanotechnology, contact Kate Chalfin at kchalfin@astm.org or go to http://www.astm.org/COMMITTEE/E56.htm. The next Committee E56 meeting will take place at the Grand Hyatt San Antonio on May 2-3, 2016. For more information or to preregister for this meeting, go to http://www.astm.org/MEETINGS/nextmeeting.cgi?+++E56.

IEC TC 113 Anticipating an active 2016

IEC TC 113 anticipates an active 2016, including upcoming IEC/TC 113 Plenary and Working Group meetings in Lowell, Massachusetts, in May 2016. Below are items currently under consideration by this IEC Technical Committee:

Pending publication:

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

This TS, a USNC-led project, specifies a method for determining the mass of a sample of QD dispersion after the removal of impurities and surfactant ligands through heating at high temperatures.

IEC/TS 62844: Guidelines for quality and risk assessment for nano-enabled electrotechnical products

This TS provides a recommended methodology for identifying relevant parameters of nanomaterials and generic guidelines on implementation of quality assessment and environment/health/safety assessment for nano-enabled/nano-enhanced electrotechnical products.

In development:

IEC 62565-3-1: Nanomanufacturing - Material specifications - Part 3-1: Graphene - Blank detail specification

This standard, a USNC-led project, will establish a blank detail specification and format for listing essential electrical and certain other characteristics including optical, dimensional, and mechanical properties of single and few layer and functionalized graphene for use in electrotechnical applications. The third Committee Draft is planned after the TC 113/WG8 meeting in May 2016 in Boston.

IEC/TS 62565-4-2: Nanomanufacturing - Material specifications - Part 4-2: Luminescent nanomaterials - Detail specification for general lighting and display applications

This TS, a USNC-led project, specifies the essential general and optical requirements of monodisperse luminescent nanomaterials used in general lighting and display products to enable their reliable mass production and quality control during the manufacturing process. The first Committee Draft has been circulated and comments were resolved. A second CD will be circulated following the TC 113/WG10 meeting in May 2016 in Boston.

IEC/TS 62607-6-3: Nanomanufacturing - Key control characteristics - Part 6-3: Graphene - Characterization of graphene domains and defects

This newly approved work is for a TS that provides the evaluation method of determining graphene domains and defects in order to understand the effect of graphene domain size and distribution of defects on properties of graphene, and enhancing the performance of high speed, flexible, and transparent devices using CVD graphene. TC 113 is awaiting circulation of the first Committee Draft.

IEC/TS 62607-6-4: Nanomanufacturing - Key control characteristics - Part 6-4: Graphene - Conductance

measurements using resonant cavity

This TS, a USNC-led project, will establish a non-contact method for determining the surface conductance of 2D single-layer or multi-layer atomically thin nano-carbon graphene structures. The Draft Technical Specification is out for National Committee voting until March 18, 2016

IEC/TS 80004-9: Nanotechnologies - Vocabulary - Part 9: Nano-enabled electrotechnical products and systems

This TS provides terms and definitions for electrotechnical products and systems that are reliant on nanomaterials for their essential functionalities. It is intended to facilitate communications between organizations and individuals in industry and those who interact with them. TC 113 is awaiting the circulation of the Draft Technical Specification for National Committee voting.

ISO/TC 229 Publishes Terminology relative to quantum phenomena and nominates new TC Chair

ISO/TC 229 has published ISO/TS 80004-12, *Nanotechnologies – Vocabulary – Part 12: Quantum phenomena.* This ISO Technical Specification focuses on the relationship of terms in nanotechnology and quantum effects, which will be important for the identification of nano-enabled products and for the development of nanotechnology.

More information regarding the document above, or any published ISO Standards or other deliverables, can be reviewed after publication using the ISO Online Browsing Platform (https://www.iso.org/obp/ui/). All ISO published documents are available for purchase via ANSI's Webstore.

Dr. Simon Holland, Chair of this ISO Technical Committee from 2012 – 2015, has retired from this Committee. Dr. Denis Kolstov of the United Kingdom has been nominated to replace Dr. Holland in this leadership position. Committee experts thanked Dr. Holland for his leadership and work on this committee.

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