Voluntary Standards: From Terminology to Stewardship

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CBEN’s mission is to develop sustainable nanotechnologies that improve human health and the environment.
The Landscape for Standards

Scientific data
Public reports
Industry practices

Standards

Contracts
Regulations
Codes
Certification

A “standard” will clarify and summarize information, and provide draft policies for agencies.
Need for Standards

- Terminology
- Metrology
- Product quality
- Intellectual property
- Environmental health & safety
Terminology: Nano’s Tower of Babel

- Researchers
  - “… helps put new discoveries in the context of previous ones and helps knit together the science of the field.” Tom Mallouk in 4/11/05 C&EN

- Regulators
  - new name = regulation? (WWIC)

- Investors
  - Intellectual property
  - Venture capital

http://www.ldolphin.org/babel.html
Confusion Abounds

Risk in Carbon Nanotubes?
Nanotech's "wonder" materials might also carry a substantial downside.

By Jack Uldrich
Motley Fool
Updated: 1:24 p.m. ET May 12, 2005

Carbon nanotubes are super-thin materials that, among other things, have an amazing strength-to-weight ratio making them up to 100 times stronger than steel and are wonderful conductors of electricity. ... 

From this perspective, the future sounds almost unlimited for carbon nanotubes, right?

Well, not so fast. A new report issued in the American Chemical Society's journal, Environmental Science & Technology, says that researchers at Rice University are now raising serious questions about how carbon nanotubes might behave in the natural environment. Specifically, the researchers now have some evidence that challenges the long-standing conventional wisdom that carbon nanotubes don't dissolve in water.

C_{60} in Water: Nanocrystal Formation and Microbial Response

8. Physical and chemical properties:
   - Solubility in / Miscibility with Water: Insoluble

11 Toxicological information
   - Subacute to chronic toxicity:
     *Elemental carbon/carbon black is mainly a nuisance dust.* It is irritating to the eyes and may cause conjunctivitis, cornea damage, and inflammation of the eyelids.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

14. Ecological hazards

National regulations
This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only.

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Are nanomaterials ‘new chemicals’?

- Public pressure: Call from environmental groups
- Data: Nano ≠ bulk for biological effects
- Logic: Nano is different for good uses ....

YES
Why Voluntary Standards?

- Infrastructure: staff, online draft development and balloting
- Timely and relevant
- Consensus based
- Inclusive
ASTM E56 Committee on Nanotechnology

Subcommittees

- E56.01 Terminology & Nomenclature*
- E56.02 Characterization
- E56.03 Environmental & Occupational Health and Safety
- E56.04 International Law & IP
- E56.05 Liaison & International Cooperation
- E56.06 Risk Management/Product Stewardship

*Cooperative agreements with IEEE, ASME, NSF Int’l, AIST (Japan)
Get Involved!

- Subcommittees are forming task groups to draft standards documents

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Other Relevant Standards Bodies

- Accredits US standard developing organizations (SDO’s)
- Serves as US member to ISO
- Created Nanotech Standards Panel to coordinate US activity
- www.ansi.org/nsp

- Composed of natl stds institute of 151 countries
- Develops and accredits stds
- Forming new technical committee on nanotech (TC 229)
Addressing nanomaterial risk in an innovative and proactive manner

http://icon.rice.edu
CBEN initiates ICON to create new focus

2001 – 2004 CBEN established itself as a world leader in nanotechnology risk, both in the technical arena and in the policy arena.

2004 – CBEN transforms its position and organization to reflect need for partnership and international scope.
ICON’s Mission

The mission of the International Council on Nanotechnology (ICON) is to assess, communicate and reduce the environmental and health risks of nanotechnology.

- **Research**: Nanotechnology and risk
- **Policy**: Standards and product stewardship
- **Communication**: Public engagement and information

COMING SOON: EHS Database of research literature
Who and What is ICON?

Stakeholder groups
- Research
- Commercialization
- Gov/Regulation/Law
- Public Oversight
CBEN Open House & ICON Meeting

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