



CBEN

Center for Biological and Environmental Nanotechnology

Voluntary Standards: From Terminology to Stewardship

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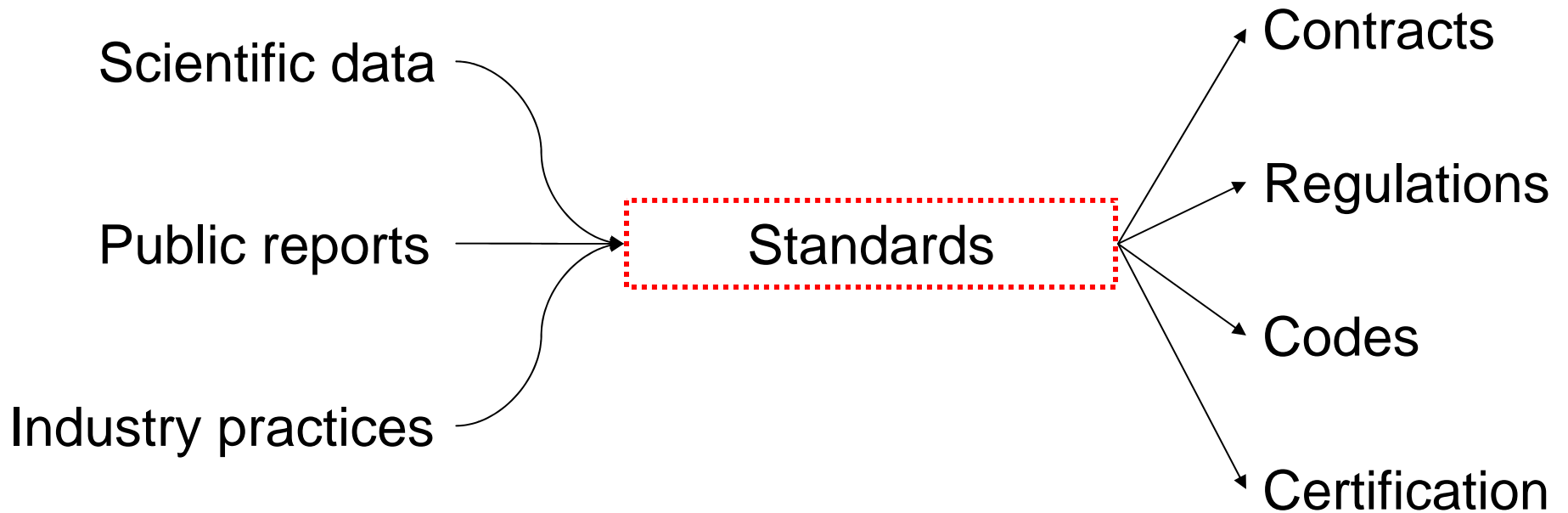
Rice University

Chair, ASTM Subcommittee E56.06 Nanotechnology Risk Management and Product Stewardship



CBEN's mission is to develop sustainable nanotechnologies that improve human health and the environment.

The Landscape for Standards



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.lodolphin.org/babel.html>

Confusion Abounds

 MSNBC.com

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.

← President of NanoVeritas, nanotech author

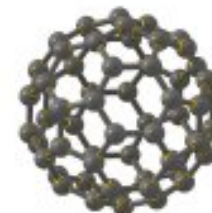
C₆₀ in Water: Nanocrystal Formation and Microbial Response

J. D. FORTNER,^{†,‡} D. Y. LYON,^{†,‡}
C. M. SAYES,^{‡,§} A. M. BOYD,^{‡,§}
J. C. FALKNER,[§] E. M. HOTZE,^{†,‡}
L. B. ALEMANY,[§] Y. J. TAO,^{||,‡} W. GUO,[§]
K. D. AUSMAN,[‡] V. L. COLVIN,^{‡,§} AND
J. B. HUGHES*,^{‡,‡}



Terminology and risk management

Material Safety Data Sheet
acc. to OSHA and ANSI ...



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.

Are nanomaterials 'new chemicals'?

- Public pressure: Call from environmental groups
- Data: Nano \neq 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
- ASTM Staff Manager:
Pat A. Picariello
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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)





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ICONTM INTERNATIONAL COUNCIL
ON NANOTECHNOLOGY

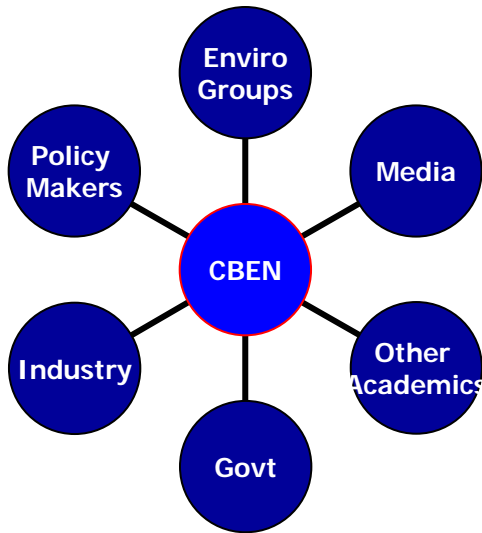
*Addressing nanomaterial risk in an
innovative and proactive manner*

<http://icon.rice.edu>

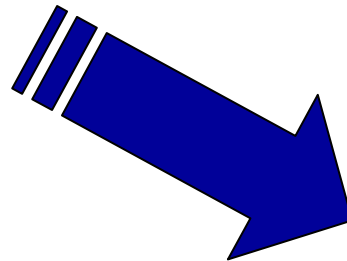


RICE

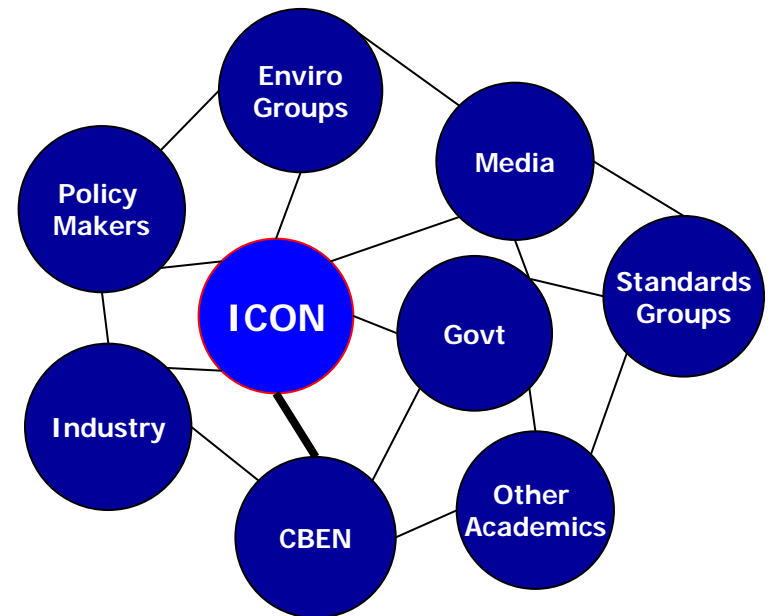
CBEN initiates ICON to create new focus



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

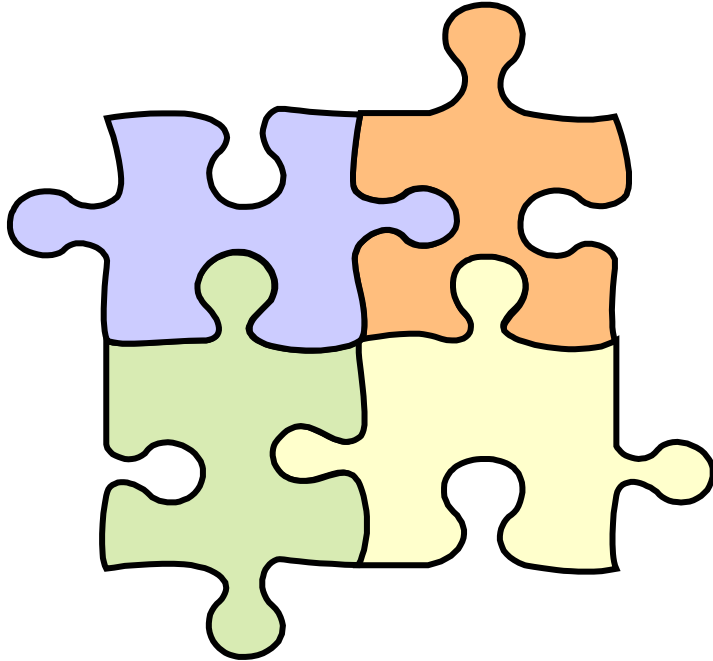
The mission of the International Council on Nanotechnology (ICON) is to assess, communicate and reduce the environmental and health risks of nanotechnology

- **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

June 20-21, 2005

Rice University

Houston, TX USA

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