



Public Release Date: November 16, 2010

Contact: Steve Gibb

Steve.Gibb@noblis.org

703.610.2441

Society for Risk Analysis

University Analysis Suggests Limiting Exposure to Carbon Nanotubes

UC Berkeley Researcher Finds Potential Adverse Health Effects Merit Caution

Washington, D.C. – While offering great promise in a host of new applications, carbon nanotubes (CNTs) could be harmful to humans and a new risk review suggests that product designers and others should provisionally treat CNTs “as if” they are hazardous.

Carbon nanotubes are extremely small, with a diameter measured in nanometers. A nanometer is one-billionth of a meter, or about one eighty-thousandth the thickness of a human hair. CNTs are very versatile and come in several forms, conferring great strength while also being very light.

Because environmental and health information on CNTs is incomplete and sometimes conflicting, an “anticipatory governance” approach to the technology is needed, according to Mark Philbrick, post-doctoral researcher at the Center of Integrated Nanomechanical Systems at the University of California, Berkeley. Anticipatory governance is an approach designed to support decision makers where there is uncertainty about safety, a common situation when managing emerging technologies.

The research was funded by the National Science Foundation and the conclusions are detailed in Philbrick's article “An Anticipatory Governance Approach to Carbon Nanotubes,” in the November issue of the journal *Risk Analysis* published by the Society for Risk Analysis. The entire November issue is devoted to risk analysis articles related to nanotechnology.

An anticipatory approach is particularly important until the toxicity and behavior of CNTs in the environment are better understood, especially as they can remain airborne for extended periods, and share some characteristics with asbestos. While a few rodent studies have found similarities between the health effects of inhaling both substances, there is not enough data to draw firm conclusions.

The article notes the promise held out by CNTs is immense: some types conduct electricity and heat better than copper, others are stronger than steel while weighing less than aluminum, and yet others could be used in targeted drug delivery. These properties could find uses in aircraft frames, sensors, and electrical transmission. Nevertheless, treating them “as if” they are

hazardous is a prudent course of action given uncertainty about their potential health consequences, the author said.

Given the “conflicted character of the data,” how “relevant actors” should respond is the central question Philbrick asks in developing strategies for utilizing CNTs. He asserts that treating carbon nanotubes “as if” they are hazardous implies limiting exposure throughout product life-cycles. This means implementing strong engineering controls for CNT research and manufacturing, avoiding applications where the CNTs would be routinely released to the environment, and planning for recycling at the end of a product’s useful life. The article also argues that “the anticipatory governance approach is particularly important as innovation rates in nanotechnologies exceed our capacity to assess human and environmental consequences of these innovations, especially when deployed at commercial scales ... it helps identify uncertainties in our knowledge and focuses future research to address those gaps.”

Risk Analysis: An International Journal is published by the nonprofit Society for Risk Analysis (SRA). SRA is a multidisciplinary, interdisciplinary, scholarly, international society that provides an open forum for all those who are interested in risk analysis. Risk analysis is broadly defined to include risk assessment, risk characterization, risk communication, risk management, and policy relating to risk, in the context of risks of concern to individuals, to public and private sector organizations, and to society at a local, regional, national, or global level. www.sra.org

Contact: Steve Gibb, 703.610.2441 Steve.Gibb@noblis.org or Lisa Pellegrin, 571.327.4868 or Lisa.Pellegrin@noblis.org to arrange an interview with the author(s). Note to editors: The complete study is available upon request from Lisa Pellegrin/Steve Gibb or here: <http://onlinelibrary.wiley.com/doi/10.1111/j.1539-6924.2010.01445.x/full>

The Special November issue of *Risk Analysis: An International Journal* also contains the following other articles on nanotechnology:

Perspective

Exposure Assessment Approaches for Engineered Nanomaterials
Linda C. Abbott, and Andrew D. Maynard

Nanotechnology Risk Communication Past and Prologue
Ann Bostrom and Ragnar E. Lofstedt

Perspective

The Uncertainty of Nanotoxicology: Report of a Society for Risk Analysis Workshop
Richard A. Canady

Perspective

Nanotechnology, Risk, and Oversight: Learning Lessons from Related Emerging Technologies
Jennifer Kuzma and Susanna Priest

Responsible Innovation: A Pilot Study with the UK Engineering and Physical Sciences Research Council
Richard Owen

Comparative Study of Predictive Computational Models for Nanoparticle-Induced Cytotoxicity
Christie Sayes and Ivan Ivanov

Perspective

Nano Risk Analysis: Advancing the Science for Nanomaterials Risk Management
Jo Anne Shatkin, Linda Carolyn Abbott et. al.

Perspective

Risk Characterization for Nanotechnology
Richard A. Williams, Kristen M. Kulinowski, et. al