HealthFacts

Nanoparticles in everyday home products may have lasting and irreversible health impacts.

Nanotechnology's Invisible Threat:

Small Science, Big Consequences

From mascara to tennis balls to baby wipes, tiny nanoparticles are hidden in many of the products we use every day. But nanotechnologies are still new, and there are big unanswered questions about their potentially harmful effects on our health and the environment. Current regulations fail to guarantee consumers that these new technologies are safe to use. That's why NRDC is pushing the government to move quickly to catch up to the technology and ensure the safety of our consumer products.

"The potential danger to human beings and the environment is literally incalculable if we don't understand how nanotechnology can interact with our bodies and our world."

REP. S. BOEHLERT (R-NY)
SEPTEMBER 2006

The Potential Health Risks

Nanotechnologies involve manipulating ultrafine particles in a size range of 1 to 100 nanometers; the head of a pin is comparatively large at about 1 million nanometers across. Nanoparticles are increasingly finding uses as ingredients in commercial products. But the very qualities that make nanoparticles commercially desirable can also render them more toxic than their normal-sized counterparts. Because they are so small, nanoparticles are extremely mobile; they are able to enter the lungs, pass through cell membranes, and possibly penetrate the skin. Once inside the body, they seem to have unlimited access to all tissues and organs, including the brain and likely also the fetal circulation, and may cause cell damage that we don't yet understand. Studies of ultrafine air pollution have shown that inhalation of nano-sized particles increases the risk of asthma attacks and of death from heart attacks, strokes, and respiratory disease.

Until we know the risks of nanomaterials, these products remain potentially dangerous to consumers. They also pose a potential hazard to the workers who are exposed to them during product development, production, use, and disposal. To this end, labor unions and environmental justice advocates have joined together to call on the EPA to move quickly to fully disclose hazards and take protective action to prevent harm to workers and their families from nanomaterials.[1]

NRDC
THE EARTH'S BEST DEFENSE

www.nrdc.org/policy

Health Facts

Nanotechnology's Invisible Threat

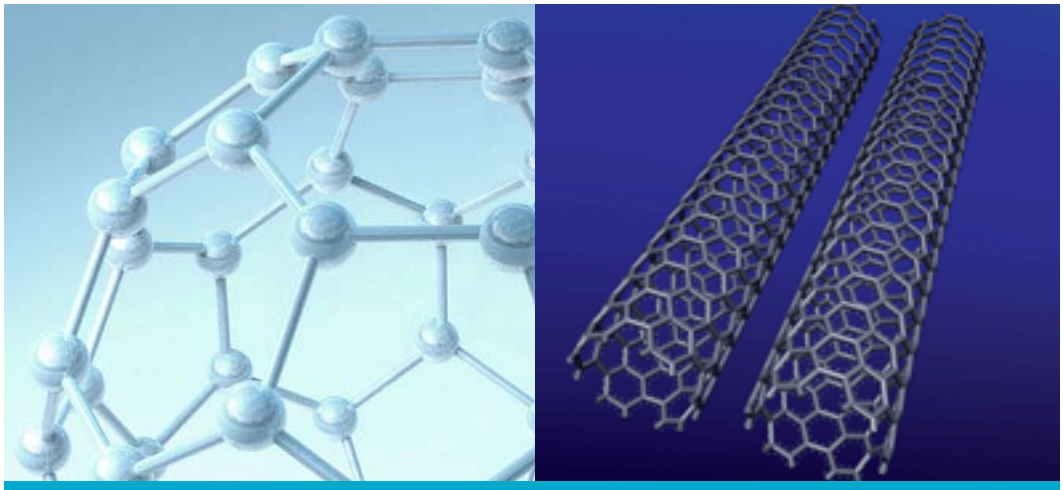

Image courtesy of Accelrys, www.accelrys.com

Carbon-based nanomaterials such as buckyballs (above left) and nanotubes (above right) may cause damage to the brain, the lungs, and the cardiovascular and immune systems.

What to Look for on the Label

The words "nano" and "ultrafine" on a list of ingredients indicate that a product contains nanomaterials, and is potentially unsafe.

Where Are Nanomaterials Found?

Despite serious questions about the health hazards of nanoparticles, more and more companies are entering the nanotechnology field. Hundreds of products are manufactured using nanomaterials, including[2]:

- Behr Premium Plus Kitchen and Bath Paint
- Blue Lizard Baby Sunscreen
- Dockers® Go Khaki® slacks
- FresherLonger™ Miracle Food Storage
- TX Express Laptop Computer
- Turtle Wax® F21™ Super Protectant Wax
- Nanover™ Wet Wipes
- First Response® Home Pregnancy Test
- Cosmetic and personal care products from L'Oréal, Dior, and Lancome, among other brands

The Nanotechnology Boom

Nanotechnologies are very likely the future of chemistry. Despite the as-yet-unknown effects of nanotechnologies on human health, manufacturers are already incorporating nano-scale particles into hundreds of consumer products. Products as diverse as suntan lotion, house paint, and stain-proof clothing already contain nanoparticles. Future nano-engineering techniques are likely to produce hybrid combinations of nano-sized chemical-biological and chemical-mechanical substances.

Demand Regulation of Potentially Harmful Substances

It is crucial that regulation of these nanosubstances advance as quickly as the technologies that are generating them. But the current approach to chemical regulation is slow, costly, and has failed to prevent deadly chemical exposures. NRDC has developed a four-part framework for how nanomaterials should be regulated to protect consumers who use these products and the workers who manufacture them.

- **Prohibit the untested or unsafe use of nanomaterials.** This places the burden on industry to provide assurances of safety, rather than on regulators to prove harm.
- **Act on early warnings to protect communities and workers.** Health-protective regulations should be set if there is any evidence of risk, even if uncertainty remains regarding the nature and magnitude of the harm.[3]
- **Conduct full life-cycle environment, health, and safety (EHS) impact assessments before putting nanotechnologies on the market; assess nanomaterials as new substances, since their unique physical properties impart unique hazard profiles.** Independent testing is urgently needed to understand the hazards of nanomaterial exposure across the lifecycle of a product. The results of these tests should be made available to the public.
- **Facilitate full and meaningful participation by public and workers in nanotechnologies development and control; consider the social and ethical impacts of nanotechnologies.** The potential of nanotechnologies to transform the global social, economic, and political landscape means we must move the decision-making out of corporate boardrooms and into the public realm.

1 Comments on risk management practices for nanomaterials, especially as it relates to exposure of workers. K. Burns, Docket ID Number EPA-HQ-OPPT-2004-0122, October 27, 2006.

2 See www.nanotechproject.org for a more complete consumer inventory.

3 The Louisville Charter for Safer Chemicals, www.louisvillecharter.org

NRDC
THE EARTH'S BEST DEFENSE

© Natural Resources Defense Council Dec 2006

Printed on recycled paper