

THE POLICY AND POLITICS OF NANOMATERIALS

Jennifer Sass, Ph.D.

Senior Scientist, Natural Resources Defense Council (NRDC) and,
Professorial Lecturer, George Washington University (SEIU Local 500)

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EPA TOXIC SUBSTANCES CONTROL ACT

TSCA Chemical Approval – Carbon Nanotubes

In June 2013 EPA issued SNURs – Significant New Use Rules - for carbon nanotubes.

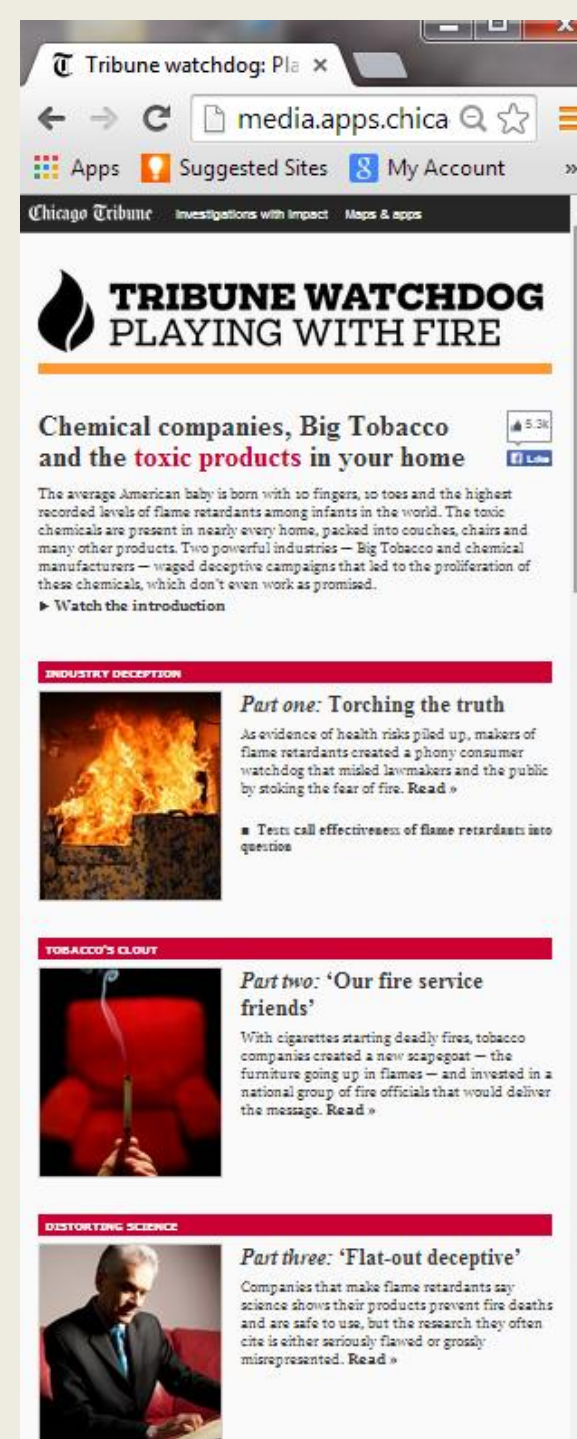
In its notice of the proposed rule, EPA noted concern for lung toxicity, fibrosis, cancer, mutagenicity, and immunotoxicity (Docket ID EPA-HQ-OPPT-2010-0279-0130)

**REGRETTABLE SUBSTITUTION –
flame retardants**

Chemical companies, Big Tobacco and the toxic products in your home

The average American baby is born with 10 fingers, 10 toes and the highest recorded levels of flame retardants among infants in the world. The toxic chemicals are present in nearly every home, packed into couches, chairs and many other products. Two powerful industries — Big Tobacco and chemical manufacturers — waged deceptive campaigns that led to the proliferation of these chemicals, which don't even work as promised. (2012)

<http://media.apps.chicagotribune.com/flame/s/index.html>



The screenshot shows a web browser window with the URL media.apps.chicagotribune.com/flame/s/index.html. The page features the Chicago Tribune logo and the headline "TRIBUNE WATCHDOG PLAYING WITH FIRE". The main article title is "Chemical companies, Big Tobacco and the toxic products in your home". Below the title is a sub-headline "INDUSTRY DECEPTION" and a section titled "Part one: Torching the truth". The text describes how evidence of health risks led to a phony consumer watchdog. Below this is another section titled "TOBACCO'S CLOUT" and "Part two: 'Our fire service friends'", which discusses how cigarette companies created a scapegoat for furniture fires. The final section is "DISTORTING SCIENCE" and "Part three: 'Flat-out deceptive'", which states that companies claim their products prevent fire deaths, but the research is often misrepresented. The page includes social media sharing icons and a "Watch the introduction" link.

PBDE's

Found in the blood and breast milk of most Americans

Found in wildlife at the North Pole, which are traditional food sources

Women with higher levels of flame retardants in their [blood take longer to get pregnant](#) and have [smaller babies](#). Children exposed in the womb have altered brain development resulting in [delayed physical development](#), [lower IQs and attention problems](#). Other studies have linked flame retardants to [male infertility](#), [male birth defects](#), and [early puberty in girls](#). A recent study in animals has linked flame retardants to [autism](#) and [obesity](#).

<http://blogs.scientificamerican.com/WSS/post.php?blog=49&post=5618>

EPA Uses TSCA – Toxic Substances Control Act to Target decaBDE

- In December 2009 largest U.S producers of importers of decaBDE announced phase-out by 2013
- In 2012 EPA used TSCA to issue a SNUR (TSCA Section 5) requiring manufacturers or importers to notify EPA at least 90 days in advance for decaBDE; issued a Test Rule under TSCA Section 4 requiring human health and ecological studies on decaBDE
- Creates a market space for alternatives....

CHEMICAL FLAME RETARDANTS

Toxic chemicals were added to furniture foam as a requirement to a 1975 California flammability standard (TB117) that required furniture to resist an open flame.

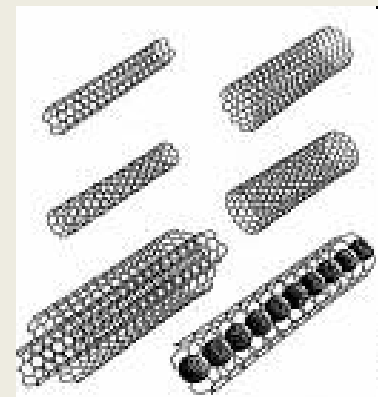
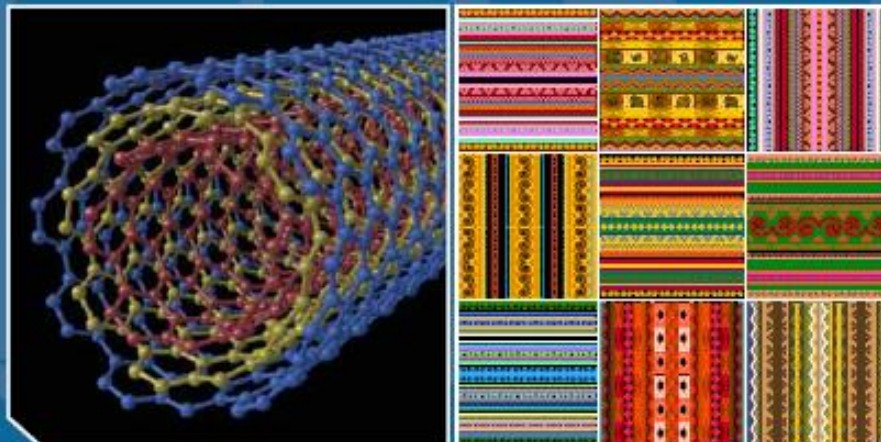
In Feb 2013— effective beginning 2014 – furniture only has to resist smoldering (not an open flame). This can be met without chemicals.



<http://greensciencepolicy.org/topics/furniture/>

<http://www.ceh.org/campaigns/flame-retardants/faqs/>

**Comprehensive Environmental Assessment
Applied to:
Multiwalled Carbon Nanotube Flame-Retardant
Coatings in Upholstery Textiles—
A Case Study Presenting Priority
Research Gaps for Future Risk Assessments**



Exposure-Dose concerns for MWCNTs in textiles

- Workplace inhalation risks are greatest concern
- Particulate when inhaled
- Consumer exposures during use
- Released from finished products in particulate form, into dust
- Biopersistent – could remain in lungs for months after inhalation
- Bioavailability will depend on whether they are bound in a matrix, bundled, or free
- Increased concern for workers and children, based on their activity patterns

<http://cfpub.epa.gov/ncea/nano/recordisplay.cfm?deid=253010>

Human Health Concerns of MWCNTs in textiles

- Tox studies mainly dermal and inhalation exposures
- Skin and eye irritation
- Respiratory sensitization
- Respiratory/lung inflammation
- Immune function altered
- Genotox conflicting results
- tracheal installation studies report that MWCNTs behave like asbestos, pre-mesothelioma, lung fibrosis, lung inflammation; may be more toxic than asbestos!
- Size matters – long, straight tubes more toxic than shorter curly tubes.
- Shorter MWCNTs (1-2 microns) are more flame-retardant than longer ones (0.5-40 microns). Commercially available MWCNTs flame retardants are about 1.5 microns (Nanocyl).



EPA PESTICIDE REGULATION

NANOSILVER

NRDC won a lawsuit forcing the registration of a nanosilver pesticide – AGS-20 made by HeiQ - in textiles back to EPA to re-consider risk to toddlers (November 2013)

Unfortunately, even before the court finalized its decision, EPA had already proposed to conditionally approved another nanosilver pesticide product called Nanosilva, for textiles and plastics in late August, 2013

EPA has no long term toxicity testing data on nanosilver



http://switchboard.nrdc.org/blogs/jsass/court_rules_in_nrdcs_favor_to.html

http://switchboard.nrdc.org/blogs/jsass/greenscreen_hazard_assessment.html

Summer 2011: EPA is “particularly interested in nanoscale materials” in relation to its statutory obligation to determine whether the registration of a pesticide may cause unreasonable adverse effects on the environment



August 17, 2011

Docket number EPA-HQ-OPP-2010-0197
76 Federal Register 35383 (Friday, June 17, 2011)

**Comments from the
Natural Resources Defense Council (NRDC) and
Environmental Defense Fund (EDF)**

**Pesticides; Policies Concerning Products
Containing Nanoscale Materials;**

Document ID: EPA-HQ-OPP-2010-0197-0001

FDA- NANO IN FOOD

NANO SILICA

Fumed silica has been commercially available for decades and used as a flow agent in foods and powders. Synthetic amorphous silica is *Generally Recognized as Safe* (GRAS) when added directly or indirectly to food (FDA, 2010) and is approved for use as a food additive in the EU (EC, 2009).

FDA approved nano silica as a GRAS food additive, based on NO NEW DATA. Studies include:

- single-dose studies
- Studies from the 1950s – 1980s (pre-date Good Laboratory Practices, GLP)
- Unpublished and not publicly available
- Sponsored by manufacturer, Cab-O-Sil

<http://www.fda.gov/Food/IngredientsPackagingLabeling/GRAS/NoticeInventory/ucm225016.htm>

WORKPLACE RISKS

Occupational Handling of Nickel Nanoparticles: A Case Report

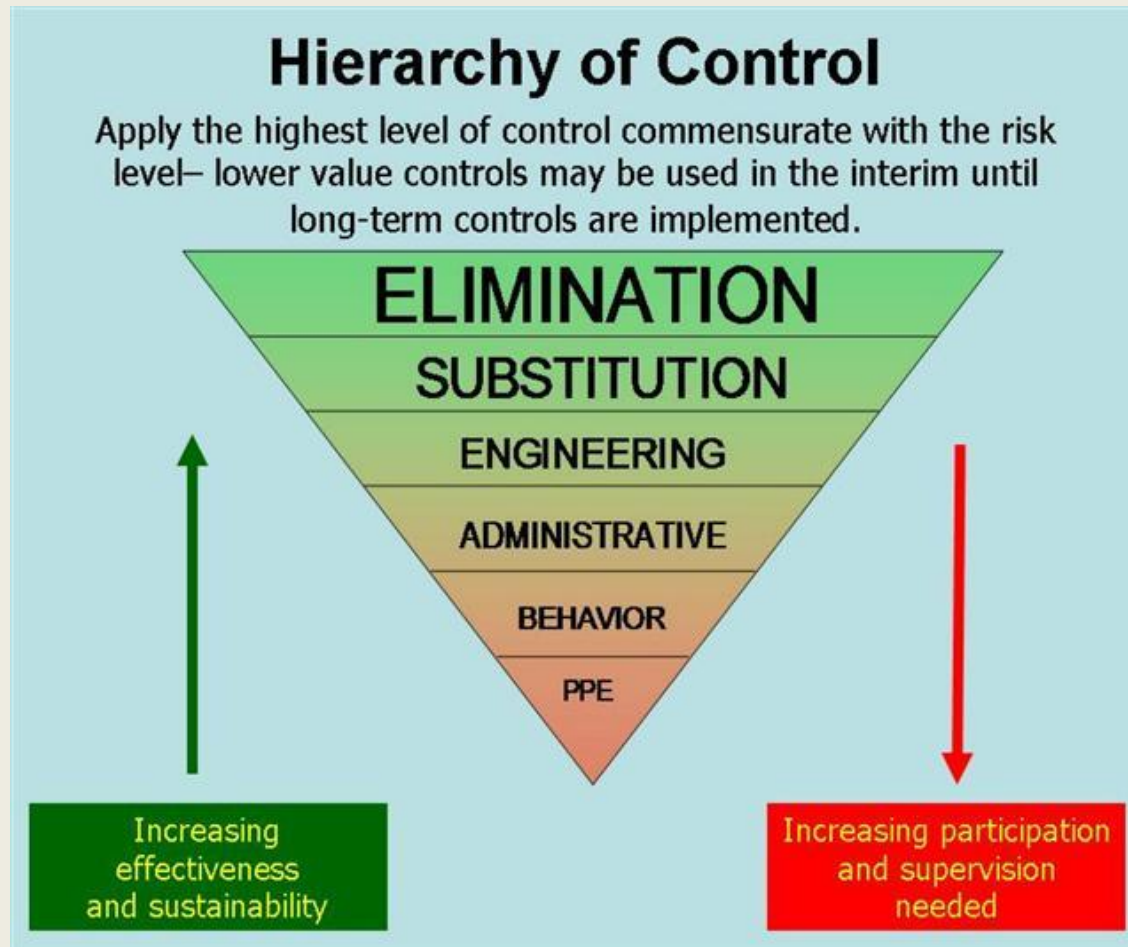
W. Shane Journey, PhD, MD^{1*} and Rose H. Goldman, MD, MPH^{2,3,4**}

A 26-year-old female chemist formulated polymers and coatings usually using silver ink particles. When she later began working with nickel nanoparticle powder weighed out and handled on a lab bench with no protective measures, she developed throat irritation, nasal congestion, "post nasal drip," facial flushing, and new skin reactions to her earrings and belt buckle which were temporally related to working with the nanoparticles. Subsequently she was found to have a positive reaction to nickel on the T.R.U.E. patch test, and a normal range FEV1 that increased by 16% post bronchodilator. It was difficult returning her to work even in other parts of the building due to recurrence of symptoms. This incident triggered the company to make plans for better control measures for working with nickel nanoparticles. In conclusion, a worker developed nickel sensitization when working with nanoparticle nickel powder in a setting without any special respiratory protection or control measures. Am. J. Ind. Med. © 2014 Wiley Periodicals, Inc.

KEY WORDS: *nanotoxicology; nanotechnology; nickel nanoparticles; occupational exposure; humans*

United We Bargain – Divided We Beg!

2014 – EPA expanded recommendations for protecting workers from carbon nanotubes



CONCLUSION

We know too little, and are learning it too late....

New chemicals – including nanomaterials – are commercialized without being adequately tested for potential health and environmental impacts, and without restrictions to prevent harm.

We need a chemical review and approval process that works!

An Agency Priority

“More than 30 years after Congress enacted the Toxic Substances Control Act, it is clear that we are not doing an adequate job of assessing and managing the risks of chemicals in consumer products, the workplace and the environment. It is now time to revise and strengthen EPA’s chemicals management and risk assessment programs.”



EPA Administrator, Lisa Jackson

Jan. 23, 2009