

This is the bi-weekly bulletin of the TURI Library at the University of Massachusetts Lowell. Greenlist Bulletin provides previews of recent publications and websites relevant to reducing the use of toxic chemicals by industries, businesses, communities, individuals and government. You are welcome to send a message to mary@turi.org if you would like more information on any of the articles listed here, or if this email is not displaying properly.

Use of a modified GreenScreen™ tool to conduct a screening-level comparative hazard assessment of conventional silver and two forms of nanosilver

Source: Environmental Health, 2016

Authors: Jennifer Sass, Lauren Heine, and Nina Hwang

Increased concern for potential health and environmental impacts of chemicals, including nanomaterials, in consumer products is driving demand for greater transparency regarding potential risks. Chemical hazard assessment is a powerful tool to inform product design, development and procurement and has been integrated into alternative assessment frameworks. The extent to which assessment methods originally designed for conventionally-sized materials can be used for nanomaterials, which have size-dependent physical and chemical properties, has not been well established. We contracted with a certified GreenScreen™ profiler to conduct three GreenScreen™ hazard assessments, for conventional silver and two forms of nanosilver. ...

An existing method for chemical hazard assessment and communication can be used -- with minor adaptations -- to compare hazards across conventional and nano forms of a substance. The differences in data gaps and in hazard profiles support the argument that each silver form should be considered unique and subjected to hazard assessment to inform regulatory decisions and decisions about product

In This Issue

Use of a modified GreenScreen tool to conduct a screening-level comparative hazard assessment of conventional silver and two forms of nanosilver

DecaBDE restrictions decision published in Official Journal

A non-estrogenic alternative to Bisphenol A at last?

Sublethal and Reproductive Effects of Acute and Chronic Exposure to Flowback and Produced Water from Hydraulic Fracturing on the Water Flea *Daphnia magna*

Tailoring Soft Polymer Networks Based on Sugars and Fatty Acids toward Pressure Sensitive Adhesive Applications

Gore to drop waterproofing PFCs

US EPA establishes Science Advisory Committee on Chemicals

From Perchloroethylene Dry Cleaning to Professional Wet Cleaning: Making the Health and Business Case for Reducing Toxics

Disinfection By-Product Exposures and the Risk of Specific Cardiac Birth Defects

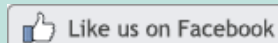
Tracing the chemistry of household dust

Join Our Mailing List

Quick Links

[Greenlist Bulletin Archives](#)

[TURI Website](#)



design and development. A critical limitation of hazard assessments for nanomaterials is the lack of nano-specific hazard data -- where data are available, we demonstrate that existing hazard assessment systems can work. The work is relevant for risk assessors and regulators. We recommend that regulatory agencies and others require more robust data sets on each novel nanomaterial before granting market approval.

[Read more...](#)

DecaBDE restrictions decision published in Official Journal

Source: [ECHA Weekly, February 2017](#)

New restrictions on the use of the flame retardant decaBDE have been published in the Official Journal and Annex XVII to the REACH Regulation has been amended accordingly. The restrictions will apply from 2 March 2019.

[Read more...](#)

See [link](#) to the Official Journal. See related article from Chemsec, "[New restriction rules in the EU for toxic flame retardant decaBDE](#)".

Also see from ECHA, "[More clarity for read-across assessment](#)", "[Enhanced completeness check delivers its first results](#)", and "[Last call to pre-register your low volume chemicals](#)".

A non-estrogenic alternative to Bisphenol A at last?

Source: [Environmental Defense Fund, January 23, 2017](#)

Author: Sarah Vogel

Last week a new study was published showing promising results for a non-estrogenic alternative to polymers based on bisphenol A (BPA) used to line the inside of food cans. The paper, in *Environmental Science & Technology (ES&T)*, evaluated the estrogenicity of an alternative to BPA -- tetramethyl bisphenol F (TMBPF) -- and its final polymer product developed by Valspar, a major paint and resin company. The authors found that, unlike BPA and some of its analogs that have been used as substitutes, TMBPF exhibited no signs of estrogenicity.

This was an unusual paper on a number of fronts -- how the material was selected, how it was evaluated and by whom. In this post I'm going to explore who was involved, what testing was done and what this might mean for the BPA alternatives market.

But first a bit of context because you may be asking, aren't there already non-BPA-based polymer alternatives for use in food cans? What about those cans that say "BPA-free"? The reality is that despite serious, decades-long concerns about the estrogenicity of BPA, the chemical continues to be widely used to make linings of food cans due to the considerable versatility of the material, which has made it challenging for alternatives to penetrate the market. There are a few alternatives available but none have offered a total replacement of BPA-based coatings used in nearly all food cans today.

[Read more...](#)

See article from *Environmental Science & Technology*, "[Evidence of Absence: Estrogenicity Assessment of a New Food-Contact Coating and the Bisphenol Used in Its](#)

[Synthesis](#)".

Also see article in *Chemical Watch*, "[Common BPA alternative, BPS, crosses into placenta](#)".

Sublethal and Reproductive Effects of Acute and Chronic Exposure to Flowback and Produced Water from Hydraulic Fracturing on the Water Flea *Daphnia magna*

Source: *Environmental Science & Technology*, January 31, 2017

Authors: Tamzin A. Blewett, Perrine L. M. Delompré, Yuhe He, Erik J. Folkerts, Shannon L. Flynn, Daniel S. Alessi, and Greg G. Goss

Hydraulic fracturing is an industrial process allowing for the extraction of gas or oil. To fracture the rocks, a proprietary mix of chemicals is injected under high pressure, which later returns to the surface as flowback and produced water (FPW). FPW is a complex chemical mixture consisting of trace metals, organic compounds, and often, high levels of salts. FPW toxicity to the model freshwater crustacean *Daphnia magna* was characterized utilizing acute (48 h median lethal concentrations; LC₅₀) and chronic (21 day) exposures. A decrease in reproduction was observed, with a mean value of 18.5 neonates produced per replicate over a 21 day chronic exposure to 0.04% FPW, which was a significant decrease from the average of 64 neonates produced in the controls. The time to first brood was delayed in the highest FPW (0.04%) treatment. Neonates exhibited an LC₅₀ of 0.19% of full-strength FPW, making them more sensitive than adults, which displayed an LC₅₀ value of 0.75%. Quantitative PCR highlighted significant changes in expression of genes encoding xenobiotic metabolism (*cyp4*) and moulting (*cut*). This study is the first to characterize chronic FPW toxicity and will help with the development of environmental monitoring and risk assessment of FPW spills.

[Read more...](#)

Tailoring Soft Polymer Networks Based on Sugars and Fatty Acids toward Pressure Sensitive Adhesive Applications

Source: *ACS Sustainable Chemistry & Engineering*, February 1, 2017

Authors: Susana Torron, Daniel Hult, Torbjörn Pettersson, and Mats Johansson

The present work describes the synthesis and characterization of fully biobased soft polymer networks for pressure sensitive adhesives applications. The incorporation of different sugars into fatty-acid-based monomers made it possible to tailor the viscoelastic properties of the materials. Lipase catalysis allowed to afford monomers with varying hydroxyl content and epoxy-functionalities. Step-growth polymerization catalyzed by DBU resulted in soft-polyester networks through combination of the monomers with a biobased diacid. Rheological and adhesion studies were performed to elucidate the different viscoelastic and adhesive properties of the materials as a function of their composition.

[Read more...](#)

Gore to drop waterproofing PFCs

Source: *Chemical & Engineering News*, February 13, 2017

Author: Melody M. Bomgardner

Bowing to pressure from activist groups, Gore Fabrics says it is working to eliminate perfluorinated chemicals (PFCs) of environmental concern from its products. Gore

supplies water-resistant fabrics to many leading outdoor apparel makers, including Patagonia and The North Face.

High-performance outerwear is commonly coated with a PFC-based barrier to improve water resistance. But those coatings can wear off and escape into the environment.

Greenpeace and other environmental groups have targeted PFCs, a large family of chemicals, because they persist in the environment and have been found in arctic polar bears' livers and human blood. Some PFCs have been shown to have negative health effects.

Although it is not clear what proportion of PFCs found in the environment come from water-resistant clothing, Greenpeace has been campaigning since 2012 to get outdoor apparel makers to stop using the coatings and switch to alternatives.

[Read more...](#)

See from Environmental Working Group, "[Nonstick Chemicals: A Hydra-Headed Family of Toxic Compounds](#)".

Also see from *C&EN*, "[Dupont and Chemours settle PFOA suits](#)".

US EPA establishes Science Advisory Committee on Chemicals

Source: [Chemical Watch](#), February 13, 2017

Author: Kelly Franklin

The US EPA has named the 18 members that will make up its new Science Advisory Committee on Chemicals (SACC) under the recently reformed TSCA.

Formation of the committee was required within a year of the Lautenberg Chemical Safety Act's 22 June 2016 passage. By statute, its purpose is to provide "independent advice and expert consultation" with respect to the scientific and technical aspects of implementing the new TSCA.

These duties include reviewing risk assessments, models, tools, guidance documents, chemical category documents and other chemical assessment products, as appropriate.

The 18 panelists comprise nine from academia, three from state or federal government organisations, four from industry and two representing non-governmental organisations.

[Read more...](#)

Also see from *Environmental Leader*, "[First Annual TSCA Report on Chemical Risk Evaluation Posted](#)". See U.S. EPA, "[2017 Annual Report on Risk Evaluations](#)".

From Perchloroethylene Dry Cleaning to Professional Wet Cleaning: Making the Health and Business Case for Reducing Toxics

Source: [Journal of Environmental Health](#), January/February 2017

Authors: Joy Onasch, Molly Jacobs, and Elyce Biddle

Increased regulatory oversight over the use of perchloroethylene (perc) in dry cleaning establishments due to health and environmental risks have prompted many dry cleaning facilities to seek substitutes. Among the most benign alternatives is professional wet cleaning. Yet, is wet cleaning viable from a business perspective? Using data from five dry cleaners that recently transitioned from perc to professional wet cleaning, this

performance reviews changes associated with cleaning performance, natural resource use, operations, labor, and associated costs. The financial assessment found that the average payback period related to the capital investments averaged 2.5 years and the average return on investment was 3.6 (using a discount rate of 5%). Higher financial returns were observed when cleaners kept their capital investments below \$50,000. The performance evaluation found that garments cleaned with the wet cleaning technology came out as well as or better than with perc, especially as the cleaner became more familiar with the wet cleaning process. This analysis affirms the business case for wet cleaning, adding to the body of evidence that professional wet cleaning is not only environmentally preferable, but that it is also technically and financially feasible.

[Read more...](#)

TURI's Note: See our page on [Professional Wet Cleaning](#) for case studies, grant opportunities and other information.

Disinfection By-Product Exposures and the Risk of Specific Cardiac Birth Defects

Source: Environmental Health Perspectives, February 2017

Authors: J. Michael Wright, Amanda Evans, John A. Kaufman, Zorimar Rivera-Núñez, and Michael G. Narotsky

Background: Epidemiological studies suggest that women exposed to disinfection by-products (DBPs) have an increased risk of delivering babies with cardiovascular defects (CVDs).

Objective: We examined nine CVDs in relation to categorical DBP exposures including bromoform, chloroform, dibromochloromethane (DBCM), bromodichloromethane (BDCM), monobromoacetic acid (MBAA), dichloroacetic acid (DCAA), trichloroacetic acid (TCAA), and summary DBP measures (HAA5, THMBr, THM4, and DBP9).

Methods: We calculated adjusted odds ratios (aORs) in a case-control study of birth defects in Massachusetts with complete quarterly 1999-2004 trihalomethane (THM) and haloacetic acid (HAA) data. We randomly matched 10 controls each to 904 CVD cases based on week of conception. Weight-averaged aggregate first-trimester DBP exposures were assigned to individuals based on residence at birth. ...

Conclusions: To our knowledge, this is the first birth defect study to develop multi-DBP adjusted regression models as well as the first CVD study to evaluate HAA exposures and the second to evaluate bromoform exposures. Our findings, therefore, inform exposure specificity for the consistent associations previously reported between THM4 and CVDs including VSDs.

[Read more...](#)

Tracing the chemistry of household dust

Source: Chemical & Engineering News, February 7, 2017

Author: Janet Pelley

As sure as the sun rises, houses collect dust. It gathers on our knickknacks and dirties the carpets. More than just dirt, house dust is a mix of sloughed-off skin cells, hair, clothing fibers, bacteria, dust mites, bits of dead bugs, soil particles, pollen, and microscopic specks of plastic. It's our detritus and, it turns out, has a lot to reveal about our lifestyle.

For one thing, dust is far from inert. Those shed hairs and old skin cells can soak up a

constellation of contaminants originating from consumer products that we bring into our homes. Other environmental contaminants can be tracked indoors on the soles of our shoes. So in addition to fluffy hair and garden dirt, dust can hold a witch's brew of persistent organic pollutants, metals, endocrine disruptors, and more.

Not only does dust hold a long memory of the contaminants introduced to a house, but it's also a continual source of exposure for the residents. Dust gets resuspended when it's disturbed and will recirculate throughout the house, picking up substances before returning once more to the floor. "Year over year, dust accumulates in the home," says Miriam L. Diamond, an environmental chemist at the University of Toronto. Even after regular cleaning, it still accretes because homes are tightly sealed environments, and the dust gets entrenched in carpets and crevices. Dust from an old house may retain legacy pollutants such as DDT that were banned almost half a century ago, she says.

[Read more...](#)

*Greenlist Bulletin is compiled by:
Mary Butow
Research and Reference Specialist
Toxics Use Reduction Institute
University of Massachusetts Lowell
600 Suffolk Street, Wannalancit Mills Suite 501
Lowell, MA 01854-2866
978-934-4365
978-934-3050 (fax)
mary@turi.org*