

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.

US team maps chemical landscape using ECHA data

Source: [Chemical Watch, February 12, 2016](#)

A team from Johns Hopkins University in the US has used REACH safety data on 10,000 chemicals to create a database that it hopes will make read-across more accessible to non-experts.

"We have made publicly available REACH data computable," says study leader Thomas Hartung, from the university's Bloomberg School of Public Health. The team used Echa datasets to extract in vitro and in vivo data from 816,000 research studies of 10,000 chemicals registered under REACH between 2008 and 2014.

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See original article in *Altex*, "[Global Analysis of Publicly Available Safety Data for 9,801 Substances Registered under REACH from 2008-2014](#)".

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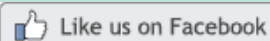
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Esterification Using a Green Catalyst

[Source: ACS Sustainable Chemistry & Engineering, February 3, 2016](#)

Authors: Namrata V. Patil and Anil N. Netravali

In this study, a biobased thermoset resin was developed from a nonedible starch source obtained from mango processing industrial waste. Mango seed starch (MSS) was extracted from defatted mango seed kernels and cross-linked using a "green" cross-linker/catalyst system, 1,2,3,4-butane tetracarboxylic acid (BTCA)/sodium propionate (NaP), to obtain the thermoset resin. The tensile properties of the cross-linked MSS were found to be adequate to replace edible starch based thermoset resins, e.g., potato or corn or proteins such as soy. The cross-linking or the esterification reaction proceeds faster and at lower temperature in the presence of a suitable catalyst. Sodium hypophosphite (SHP), a widely used catalyst for esterification using poly(carboxylic acid)s and hydroxyl groups of starch or cellulose, contains phosphorus and the effluents containing SHP, i.e., phosphorus, are toxic to humans and can adversely affect the fauna in water. Also, SHP decomposes to toxic phosphine gas when heated. The results of the present study indicate that sodium propionate (NaP), used as a nonphosphorus green catalyst, is as effective and efficient as SHP. The cross-linking of starch was confirmed directly using ATR-FTIR spectra and the degree of substitution (DS) values obtained by chemical titrations as well as indirectly through an increase in the tensile properties. Higher modulus and strength and lower degree of swelling in water of films cross-linked using NaP confirmed that NaP acts as a better catalyst than the conventional SHP.

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EPA Awards Grants to 38 Student Teams for Innovative Sustainable Projects

[Source: U.S. Environmental Protection Agency, February 16, 2016](#)

WASHINGTON -- Today, the U.S. Environmental Protection Agency (EPA) announced 38 People, Prosperity and the Planet (P3) grants to university student teams for proposed projects to develop new, sustainable products and strategies. Each team will receive up to \$15,000 for their proposals.

"This year's P3 teams have created innovative research projects that tackle some of our most pressing environmental and public health challenges," said Dr. Thomas A. Burke, EPA's Science Advisor and Deputy Assistant Administrator of EPA's Office of Research and Development. "These students have the opportunity to bring their exciting new ideas for innovation in sustainability to life, by expanding their learning experience beyond the classroom."

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See more information about the 2015/2016 P3 Grant Recipients [here](#).

Flint Residents May Have Been Drinking PFCs In Addition To Lead

[Source: The Intercept, February 17, 2016](#)

Author: Sharon Lerner

Residents of Flint, Michigan, who drank lead in their water may also have been exposed to perfluorinated compounds, or PFCs, according to a report from the Michigan Department of Community Health.

The May 2015 report showed elevated levels of PFCs in the Flint River -- including PFOA,

also known as C8, the chemical that spread into drinking water around a DuPont plant in West Virginia and led to a landmark class-action lawsuit. In addition to C8 and PFOS, a similar molecule that's also based on a chain of eight carbon atoms, scientists found 11 other PFCs in the Flint River -- more than in any of the other water sources tested around the state.

In 2014, in an effort to save money, Flint switched the source of its drinking water from Lake Huron to the Flint River, a change that resulted in residents being exposed to lead levels high enough to cause irreversible brain damage in children.

The Michigan report was based on tests of surface water and fish for PFCs in 13 sites around the state. According to Jennifer Eisner, a public information officer for the Michigan Department of Health and Human Services, the report was not designed to evaluate drinking water. Eisner referred questions about the dangers the PFCs posed to people drinking water from the Flint River to the Department of Environmental Quality, which did not return our phone calls.

[Read more...](#)

See from the Massachusetts Water Resources Authority (MWRA), "[What's Happening in Flint's Water System and How is MWRA Different?](#)" and from WBUR, "[How Do You Fix The Water Problems In Flint?](#)".

Find additional information in the background articles listed for the recent Harvard T.H. Chan School of Public Health webcast, "[Chemical Exposures and the Brain: The Flint Water Crisis and More](#)".

US committee considers chemicals for EPA low-dose review

[Source: Chemical Watch, February 18, 2016](#)

Author: Catherine Cooney

An independent committee of experts in the US has considered using phthalates, the dioxin TCDD and bisphenol A as case studies in a systematic review process for assessing low-dose effects associated with endocrine disrupting chemicals.

The National Research Council's Low Dose Committee was established following a request from the EPA for guidance on how to assess low-dose toxicity for chemicals affecting the oestrogen, androgen or thyroid pathways. It will select two or more case studies to illustrate a "systematic" review that integrates data from epidemiological as well as toxicological studies.

The studies should help answer the question of whether the EPA's current assessment practices -- in terms of low-dose toxicity effects -- need to be rethought or recast. At a workshop on 3 February the committee heard the views of three panels of experts on each of the chemicals.

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New toluene diisocyanate (TDI) occupational exposure limits adopted by the ACGIH

[Source: Covestro, February 4, 2016](#)

Pittsburgh, February 2, 2016 -- The American Conference of Governmental Industrial Hygienists (ACGIH®) has adopted new time-weighted average (TWA) and short-term exposure limit (STEL) Threshold Limit Values (TLVs®) for Toluene-2,4 or 2,6-diisocyanate or as a mixture (TDI). These adopted values lower the 8-hour TWA from 5

parts per billion (ppb) to 1 ppb and the 15-min STEL from 20 ppb to 5 ppb. ACGIH also adopted a biological exposure index (BEI®) of 5 µg/g creatinine.

ACGIH® is a private, not-for-profit, nongovernmental corporation that publishes guidelines known as TLVs® and BEIs®. ACGIH® acknowledges that these guidelines are not regulatory 'standards.' The Occupational Safety and Health Administration (OSHA) does have a standard, or a US regulatory exposure limit for TDI, which is set at 20 ppb (Ceiling limit for 2,4-TDI). This OSHA exposure limit is the only US regulatory occupational exposure limit for TDI.

[Read more...](#)

See press release from ACGIH "[ACGIH® BOARD RATIFIES 2016 TLVs® AND BEIs®](#)".

A Clever Way To Avoid Toxic Chemicals In Everyday Products

Source: [The Huffington Post, February 18, 2016](#)

Author: Casey Williams

Everyday consumer products could be exposing Americans to a raft of toxic substances.

Detox Me, a new mobile app from the nonprofit Silent Spring Institute, helps users limit their exposure to these substances by recommending which products to buy and which to walk away from.

The app, which officially launched in January, also lets shoppers scan product barcodes to look up information about items they're about to purchase.

"We were trying to figure out where chemicals are in people's lives, what ends up in their bodies and what they can do to intervene and reduce their exposure," Dr. Jessica Helm, a postdoctoral fellow at the Silent Spring Institute and the designer of Detox Me, told *The Huffington Post*.

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See Washington State Department of Health's, [Prenatal Care for Environmental Chemicals](#).

Also see information on Vermont's [Chemical Disclosure Program for Children's Products](#).

Removing harmful metals from wastewater with crab shells

Source: [Chemical Engineering, February 1, 2016](#)

Author: Paul Grad

Copper and cadmium exist naturally in the environment, but human activity can increase their concentrations to a point where they become a health hazard. Conventional wastewater treatment to remove those metals includes chemical precipitation, coagulation, flocculation, ion exchange, membrane filtration, activated carbon, and the use of carbon nanotubes. However, naturally occurring biosorbents can clean up contaminated water at the same efficiency, and with little impact on the environment and on human health.

Crab shells from *Scylla serrata* (mud crab) proved to be a good biosorbent for removing copper and cadmium from industrial wastewater by researchers from the Universiti Putra Malaysia (Serdang, Malaysia; [www.upm.edu.my](#)). The researchers chose crab shells due to their abundance and ready availability as waste products. The crushed crab shells were able to remove up to 94.7% of copper (5 mg/L initial concentration), and 85.1% of

cadmium (1 mg/L initial concentration). The conditions (pH = 6, T = 25°C) closely matched the wastewater effluent characteristics from industrial mining and metal refining.

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Cytocompatibility studies of a biomimetic copolymer with simplified structure and high-strength adhesion

Source: [Journal of Biomedical Materials Research Part A, January 20, 2016](#)

Authors: M. Jane Brennan, Heather J. Meredith, Courtney L. Jenkins, Jonathan J. Wilker, and Julie C. Liu

The development of adhesives suitable for biomedical applications has been challenging given that these materials must exhibit sufficient adhesion strengths and biocompatibility. Biomimetic materials inspired by mussel adhesive proteins appear to contain many of the necessary characteristics for biomedical adhesives. In particular, poly[(3,4-dihydroxystyrene)-co-styrene] has been shown to be a high strength adhesive material with bonding comparable to or even greater than several commercial glues. Herein, a thorough study on the cytocompatibility of this copolymer provides insights on the suitability of a mussel-mimicking adhesive for applications development. The cytotoxicity of poly[(3,4-dihydroxystyrene)-co-styrene] was evaluated through assessment of the viability, proliferation rate, and morphology of NIH/3T3 fibroblasts when cultured with copolymer extracts or directly in contact with the adhesive. After 1 and 3 days of culture, both the copolymer alone and copolymer cross-linked with periodate exhibited minimal effects on cell viability. Likewise, cells cultured on the copolymer displayed proliferation rates and morphologies similar to cells on the poly-L-lysine control. These results indicate that poly[(3,4-dihydroxystyrene)-co-styrene] is highly cytocompatible and therefore a promising material for use where biological contact is important.

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See press release from Purdue University, "[Mussel-mimicking adhesive polymer shown to be non-toxic to cells](#)".

Also see from the *Journal of the American Chemical Society*, "[Polymer Composition and Substrate Influences on the Adhesive Bonding of a Biomimetic, Cross-Linking Polymer](#)".

This CEO Wants You To Know Your Essential Oil Air Freshener Has Hundreds of Chemicals In It

Source: [The Huffington Post, February 11, 2016](#)

Author: Alexander C. Kaufman

Avoiding products with long lists of unpronounceable ingredients in favor of natural components has been common sense for health-conscious shoppers for years....

The family owned company [SC Johnson] on Thursday became the first major player in the household chemicals industry to list 100 percent of the ingredients used to create fragrance in one of its lines of scented products, the Glade Fresh Citrus Blossoms collection of wax melts and air fresheners. That includes the chemicals ordinarily glossed over with catch-all phrases like "natural ingredients" or "essential oil."

Its goal, in part, is to create a new standard of transparency that would challenge upstart competitors, who sell themselves as greener alternatives, to disclose every single component in their fragrances.

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