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The Right Tools for the Job: Evaluating Frameworks for Chemical Alternatives Assessment

Source: Environmental Health Perspectives, March 2016

Author: Carrie Arnold

With the rise in green chemistry and growing concern over worker and consumer protection, businesses and regulatory agencies are increasingly looking to identify alternative chemicals for use in products and manufacturing processes. Alternatives assessment involves comparing the advantages and disadvantages of potential substitutes for toxic chemicals, and numerous agencies, nonprofits, and businesses have developed frameworks to help them conduct these analyses. In this issue of *EHP*, investigators review nearly two dozen of alternatives assessment frameworks to identify what's working and what needs improvement in this rapidly advancing field.

As governments around the world begin to require alternatives assessments for chemicals of high concern, the need for more robust decision-making capabilities is becoming apparent, says first author Molly Jacobs, a project manager at the Lowell Center for Sustainable Production. To determine the factors common to a high-quality alternatives assessment framework, as well as identify areas that require more work, Jacobs and colleagues identified 20 frameworks that have been published since 1990 and evaluated six core areas: hazard assessment, exposure characterization, life cycle impacts, technical feasibility assessment, economic

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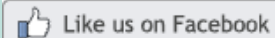
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feasibility assessment, and decision-making processes for reaching conclusions about alternatives.



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See related articles in *EHP*, "[Alternatives Assessment Frameworks: Research Needs for the Informed Substitution of Hazardous Chemicals](#)" and "[The Value of Alternatives Assessment](#)".

EPA Issues Draft Risk Assessment for Chemical used in Spray Adhesives, Dry Cleaning and Degreasing/Assessment indicates risks to workers and consumers

[Source: U.S. Environmental Protection Agency, March 3, 2016](#)

WASHINGTON -- [Today], the U. S. Environmental Protection Agency (EPA) released for public comment and peer review a draft risk assessment for 1-Bromopropane (1-BP) used in spray adhesives, dry cleaning (including spot cleaners) applications, and degreasing uses.

"This draft assessment will provide workers and consumers with critical information about the risks associated with using 1-BP in these applications," said Jim Jones assistant administrator for the office of chemical safety and pollution prevention. "Public and scientific peer review is an integral piece to ensure we use the best available science in evaluating this chemical."

The draft assessment of 1-BP, also known as n-propyl bromide, was conducted as part of EPA's Toxic Substances Control Act (TSCA) Chemical Work Plan assessment effort. The chemical showed acute risks to women of childbearing age from adverse developmental effects. Other non-cancer and cancer health risks were identified for workers with repeated and chronic exposures, including neurotoxicity, kidney, liver, and reproductive toxicity, and lung cancer.

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See TSCA Work Plan Chemical Risk Assessment PEER REVIEW DRAFT, "[1-Bromopropane: \(n-Propyl Bromide\) Spray Adhesives, Dry Cleaning, and Degreasing Uses](#)".

Also see recent article in *The Lancet Oncology*, where the International Agency for Research on Cancer (IARC) lists nPB as a Group 2B, "[Carcinogenicity of some industrial chemicals](#)".

The Year Ahead in Chemicals Regulation

[Source: JDSupra Business Advisor, March 1, 2016](#)

[Authors: Hannah Chanoine, Bob Nicksin, Eric Rothenberg](#)

Companies that manufacture and distribute chemical products across the value chain in the U.S. need to be aware of several legal developments with the potential to impact their business in the year ahead. ...

Both the California Office of Environmental Health Hazard Assessment ("OEHHA"), which implements Proposition 65, and the Office of the Attorney General, which oversees enforcement of the law, have circulated proposed regulatory amendments that, if approved, will change the way businesses comply with Proposition 65 and with the way

that it is enforced.

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Also see from the *Cape Cod Times*, "[Toxic substance reform could cut chronic diseases](#)".

Chemical Safety Bill Could Help Protect Monsanto Against Legal Claims

[Source: *The New York Times*, February 29, 2016](#)

Author: Eric Lipton

WASHINGTON -- Facing hundreds of millions of dollars in lawsuits, the giant biotechnology company Monsanto last year received a legislative gift from the House of Representatives, a one-paragraph addition to a sweeping chemical safety bill that could help shield it from legal liability for a toxic chemical only it made.

Monsanto insists it did not ask for the addition. House aides deny it is a gift at all. But the provision would benefit the only manufacturer in the United States of now-banned polychlorinated biphenyls, chemicals known as PCBs, a mainstay of Monsanto sales for decades. The PCB provision is one of several sticking points that negotiators must finesse before Congress can pass a law to revamp the way thousands of chemicals are regulated in the United States.

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Chemical regulation is economically beneficial for many companies

[Source: ChemSec, February 23, 2016](#)

By studying several aspects of chemical regulation and substitution it is clear that the economic benefits outweigh the drawbacks. This is the main conclusion in ChemSec's latest publication, *The Bigger Picture*, released [today].

Looking at a number of business cases, the publication shows that the business world is bursting with innovative solutions to chemical issues. It features companies that made it a part of their DNA to offer not only safer, but also better products using non-hazardous chemicals.

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Access report, [The bigger picture: Assessing economic aspects of chemicals substitution](#).

Meeting the Needs for Released Nanomaterials Required for Further Testing - The SUN Approach

[Source: *Environmental Science and Technology*, February 11, 2016](#)

Authors: Bernd Nowack, Alessio Boldrin, Alejandro Caballero, Steffen Foss Hansen, Fadri Gottschalk, Laura Heggelund, Michael Hennig, Aiga Mackevica, Hanna Maes, Jana Navratilova, Nicole Neubauer, Ruud Peters, Jerome Rose, Andreas Schäffer, Lorette Scifo, Stefan van Leeuwen, Frank von der Kammer, Wendel Wohlleben, Anne Wyrwoll, and Danail Hristozov

The analysis of the potential risks of engineered nanomaterials (ENM) has so far been almost exclusively focused on the pristine, as-produced particles. However, when considering a life-cycle perspective, it is clear that ENM released from genuine products

during manufacturing, use, and disposal is far more relevant. Research on the release of materials from nanoproducts is growing and the next necessary step is to investigate the behavior and effects of these released materials in the environment and on humans. Therefore, sufficient amounts of released materials need to be available for further testing. In addition, ENM-free reference materials are needed since many processes not only release ENM but also nanosized fragments from the ENM-containing matrix that may interfere with further tests. The SUN consortium (Project on "Sustainable Nanotechnologies", EU seventh Framework funding) uses methods to characterize and quantify nanomaterials released from composite samples that are exposed to environmental stressors. ...

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Expert panel agrees with draft NTP reports

[Source: National Toxicology Program, March 2016](#)

An expert scientific panel reviewed draft National Toxicology Program (NTP) technical reports on the carcinogenicity and toxicity of the flame retardant, antimony trioxide, and the metalworking fluid, TRIM VX. Jon Mirsalis, Ph.D., from SRI International in Menlo Park, California, chaired the meeting. ...

Antimony trioxide is the most commercially significant form of the metal antimony. It is used as a flame retardant in canvas, textiles, paper, and plastics, and as a catalyst in plastics manufacturing. The major source of human exposure is by inhalation during metal ore mining and smelting operations. Antimony trioxide dust and fumes have been shown to cause irritation of the respiratory tract and mucous membranes. It was nominated for NTP study by the Consumer Product Safety Commission and NIEHS, due to substantial human exposure in occupational settings. ...

TRIM VX is a metalworking fluid used as a lubricant and coolant, and for cleaning tools and parts during metal cutting, drilling, milling, and grinding. The National Institute for Occupational Safety and Health nominated such fluids for NTP study because of their high production volume, the large number of occupationally exposed workers, and the lack of carcinogenicity and toxicology data.

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EPA to require chemical companies to consider inherently safer technologies

[Source: Chemical & Engineering News, March 2, 2016](#)

[Author: Jyllian Kemsley](#)

EPA's proposal would, for the first time, require a subsection of companies, including refiners and chemical makers, to consider using alternative, safer technologies as they regularly update their [risk management plans], which is required at least every five years.

Consideration is all that would be required; implementation of safer technologies would not be, stresses Mathy Stanislaus, EPA assistant administrator for land and emergency management. EPA would have access to a company's assessment of safer technologies but the public would not, Stanislaus tells *C&EN*.

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High-throughput platform for predicting kidney toxicity is part of new international collaboration between Singapore researchers and US EPA to advance non-animal approaches to chemical safety testing

[Source: AltTox.org, February 22, 2016](#)

Researchers from the Institute of Bioengineering and Nanotechnology and the Bioinformatics Institute at the Agency for Science, Technology and Research (A*STAR) in Singapore have reported significant breakthroughs in the development of an animal-free approach for predicting the toxicity of drugs and other substances to the human kidney (i.e., nephrotoxicity).

The proximal tubule cells (PTCs) of the kidney are a major target of toxic injury. Researchers from A*STAR's Zink laboratory originally used embryonic stem cells to establish cultures of human PTCs for toxicity testing (Narayanan et al., 2013), but have now developed a more efficient method using reprogrammed induced pluripotent stem cells (iPSCs) (Kandasamy et al., 2015).

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Also see from *Chemical Watch*, "[US institute to develop non-animal test for respiratory sensitization](#)".

Two New England Small Businesses Awarded EPA Funding to Develop Environmental Technologies

[Source: U.S. Environmental Protection Agency, March 3, 2016](#)

BOSTON -- Two New England small businesses -- one in Connecticut and the other in Massachusetts -- were among eight companies nationwide awarded contracts by the U.S. Environmental Protection Agency to develop innovative technologies to protect the environment.

Precision Combustion, Inc. in North Haven, Conn. and Aspen Products Group in Marlborough, Mass. were each given \$300,000 by EPA to develop their projects. Both New England companies as well as the other six funded nationally have received smaller awards in the past from EPA to design the products. ...

Aspen Products Group will be designing a membrane or skin that removes contaminants arising from wastewater that are being found more frequently in drinking water supplies. A membrane that rejects these contaminants while producing drinking water would be developed in this project. The membrane produces water at five to 10 times the rate of other membranes, significantly reducing the energy consumption and cost. These "emerging contaminants" include pharmaceuticals, antibiotics, hormones, flame retardants, personal care products, and pesticides. The technology also has applications in the chemical, petroleum, pharmaceutical, food-processing and wastewater-treatment industries.

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