Moderated Podium Discussion

The Way Forward:

PFAS as a Blueprint for Emerging Contaminants

Scientific Strategy for Change

Science + Communication + Decision Makers
=Change

Arlene Blum, Ph.D.
Green Science Policy Institute &
Chemistry, University of California, Berkeley
1 December 2020

GREEN SCIENCE POLICY INSTITUTE

Scientific Research

Convene busness, govenrment, academia, NGOs

Communicate

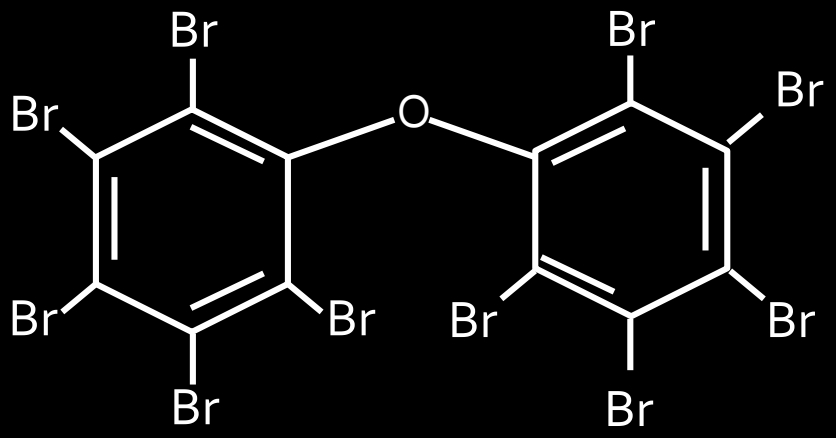
Government Policy & Business Purchasing Change

Six Classes Videos

www.SixClasses.org

Healthier products, healthier people in four minutes!

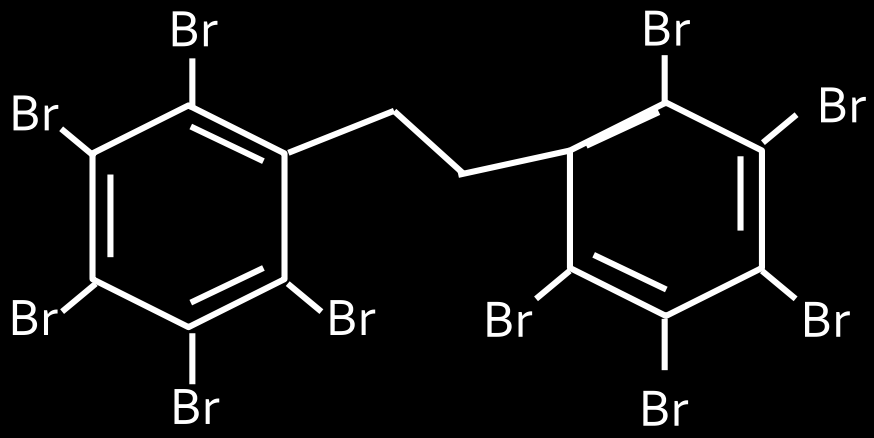
Regrettable Substitution



Decabromodiphenyl ether

Concerns:

- Persistence
- Bioaccumulation
- Toxicity



Decabromodiphenyl ethane

Concerns:

- Persistence
- Bioaccumulation
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Flame Retardant(FR) Standards

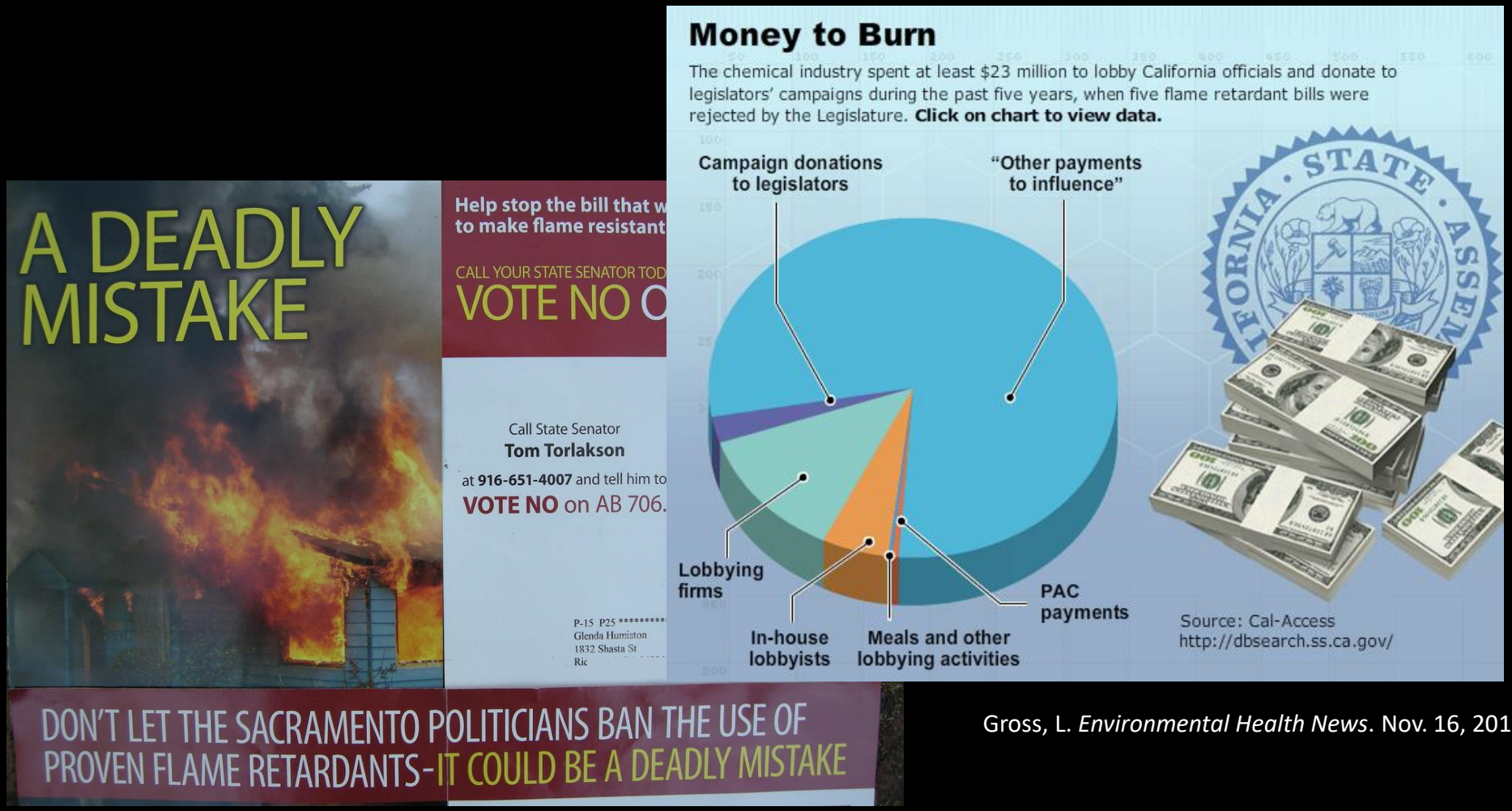
California Technical Bulletin 117

- Required foam to withstand a small open flame for 12 seconds

- No overall fire safety benefit
  - fires start in fabric not filling
  - FRs make fires more smoky & toxic

- Smolder standard for fabric can
  - stop most fires before reaching foam
  - increase fire safety without the need for flame retardants

$23.2 million flame retardant industry lobbying against fire safety without flame retardants



Gross, L. *Environmental Health News*. Nov. 16, 2011

Funded by Californians for Fire Safety

Albemarle, Chemtura (purchased byLanxess), Israel Chemicals LTD (ICL)

Environmental Science & Technology

ARTICLE

pubs.acs.org/est

Identification of Flame Retardants in Polyurethane Foam Collected from Baby Products

Heather M. Stapleton,*[,†] Susan Klosterhaus,[‡] Alex Keller,[†] P. Lee Ferguson,[†] Saskia van Bergen,[§] Ellen Cooper,[†] Thomas F. Webster,[∥] and Arlene Blum[⊥]

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Supporting Information

ABSTRACT: With the phase-out of PentaBDE in 2004, alternative flame retardants are being used in polyurethane foam to meet flammability standards. However, insufficient information is available on the identity of the flame retardants currently in use. Baby products containing polyurethane foam must meet California state furniture flammability standards, which likely affects the use of flame retardants in baby products throughout the U.S. However, it is unclear which products contain flame retardants and at what concentrations. In this study we surveyed baby products containing polyurethane foam to investigate how often flame retardants were used in these products. Information on when the products were purchased and whether they contained a label indicating that the product meets requirements for a California flammability standard were recorded. When possible, we identified the flame retardants being used and their concentrations in the foam. Foam samples collected from 101 commonly used baby products were analyzed. Eighty samples contained an identifiable flame retardant additive, and all but one of these was either chlorinated or brominated. The most common flame retardant detected was tris(1,3-dichloroisopropyl) phosphate (TDCPP; detection frequency 36%), followed by components typically found in the Firemaster550 commercial mixture (detection frequency 17%). Five samples contained PBDE congeners commonly associated with PentaBDE, suggesting products with PentaBDE are still in-use. Two chlorinated organophosphate flame retardants not previously documented in the environment were also identified, one of which is commercially sold as V6 (detection frequency 15%) and contains tris(2-chloroethyl) phosphate (TCEP) as an impurity. As an addition to this study, we used a portable X-ray fluorescence (XRF) analyzer to estimate the bromine and chlorine content of the foam and investigate whether XRF is a useful method for predicting the presence of halogenated flame retardant additives in these products. A significant correlation was observed for bromine; however, there was no significant relationship observed for chlorine. To the authors knowledge, this is the first study to report on flame retardants in baby products. In addition, we have

Environmental Science & Technology

Article

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Novel and High Volume Use Flame Retardants in US Couches Reflective of the 2005 PentaBDE Phase Out

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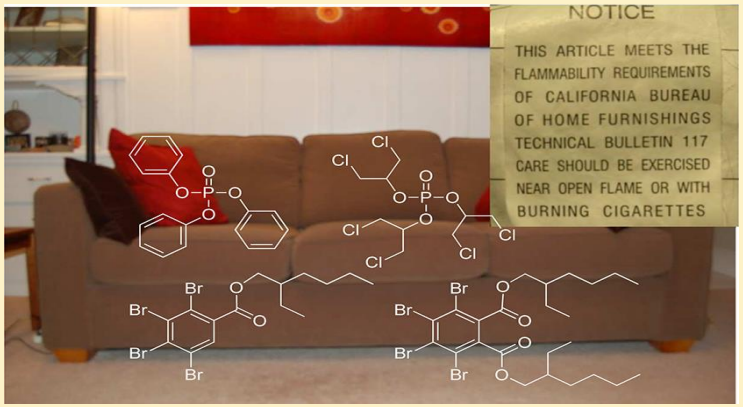
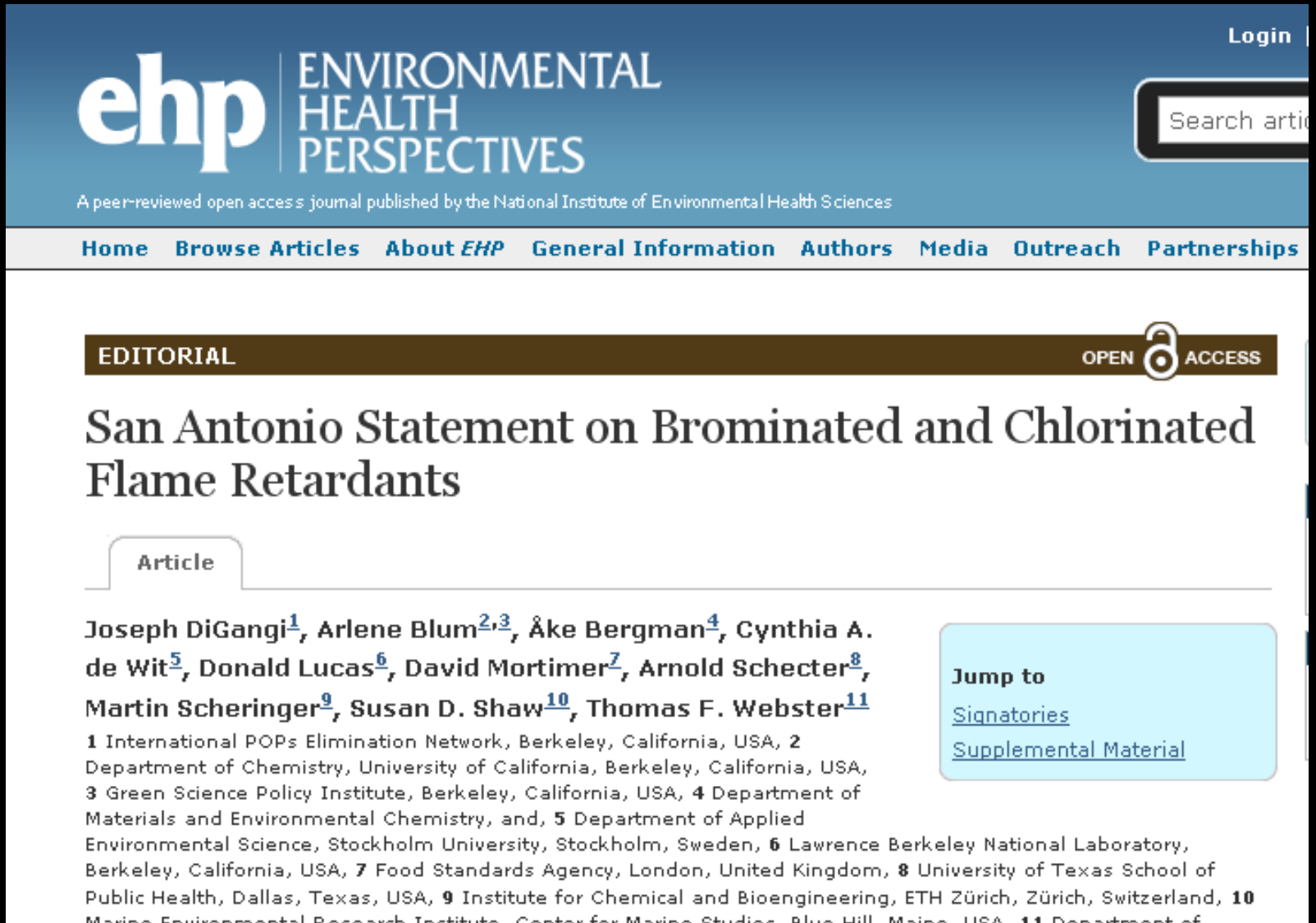
Supporting Information

ABSTRACT: California's furniture flammability standard Technical Bulletin 117 (TB 117) is believed to be a major driver of chemical flame retardant (FR) use in residential furniture in the United States. With the phase-out of the polybrominated diphenyl ether (PBDE) FR mixture PentaBDE in 2005, alternative FRs are increasingly being used to meet TB 117; however, it was unclear which chemicals were being used and how frequently. To address this data gap, we collected and analyzed 102 samples of polyurethane foam from residential couches purchased in the United States from 1985 to 2010. Overall, we detected chemical flame retardants in 85% of the couches. In samples purchased prior to 2005 (n = 41) PBDEs associated with the PentaBDE mixture including BDEs 47, 99, and 100 (PentaBDE) were the most common FR detected (39%), followed by tris(1,3-dichloroisopropyl) phosphate (TDCPP; 24%), which is a suspected human carcinogen. In samples purchased in 2005 or later (n = 61) the most common FRs detected were TDCPP (52%) and components associated with the Firemaster550 (FM 550) mixture (18%). Since the 2005 phase-out of PentaBDE, the use of TDCPP increased significantly. In addition, a mixture of nonhalogenated organophosphate FRs that included triphenyl phosphate (TPP), tris(4-butylphenyl) phosphate (TBPP), and a mix of butylphenyl phosphate isomers were observed in 13% of the couch samples purchased in 2005 or later. Overall the prevalence of flame retardants (and PentaBDE) was higher in couches bought in California compared to elsewhere, although the difference was not quite significant (p = 0.054 for PentaBDE). The difference was greater before 2005 than after, suggesting that TB 117 is becoming a de facto standard across the U.S. We determined that the presence of a TB 117 label did predict the presence of a FR; however, lack of a label did not predict the absence of a flame retardant. Following the PentaBDE phase out, we also found an increased number of flame retardants on the market. Given these results, and the potential for human exposure to FRs, health studies should be conducted



Consensus Statement



ehp ENVIRONMENTAL HEALTH PERSPECTIVES

A peer-reviewed open access journal published by the National Institute of Environmental Health Sciences

EDITORIAL OPEN ACCESS

San Antonio Statement on Brominated and Chlorinated Flame Retardants

Article

Joseph DiGangi[1], Arlene Blum[2,3], Åke Bergman[4], Cynthia A. de Wit[5], Donald Lucas[6], David Mortimer[7], Arnold Schecter[8], Martin Scheringer[9], Susan D. Shaw[10], Thomas F. Webster[11]

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Jump to

Signatories

Supplemental Material

Industry Support

Elimination of Fire Retardants in Office Furniture

" …the risks associated with the use of these chemicals is greater than the hazard associated with the risk from furniture without fire retardants."

- Business & Institutional Furniture Manufacturer's Assoc.

BIFMA INTERNATIONAL

Communication

"A deceptive campaign by industry brought toxic flame retardants into our homes and into our bodies. And the chemicals don't even work as promised."

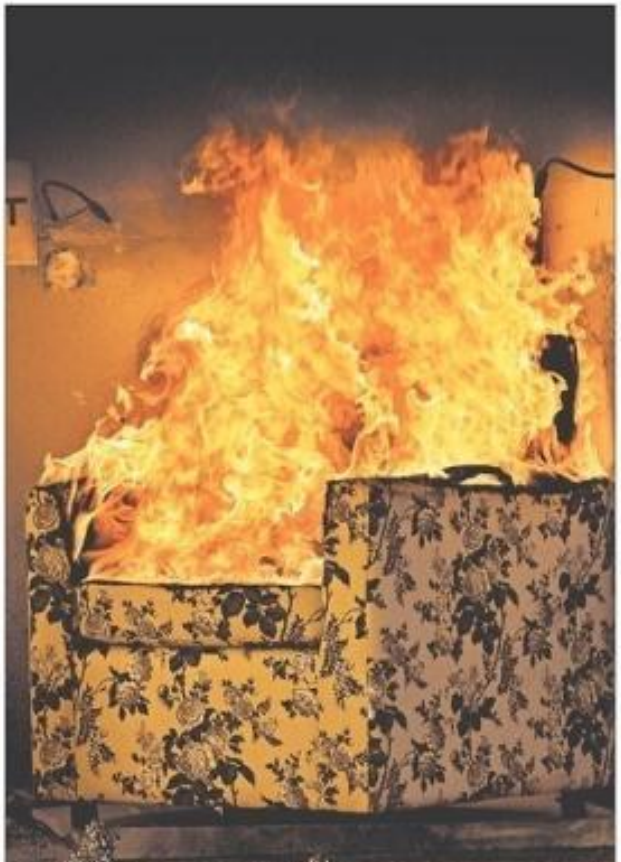
Chicago Tribune

QUESTIONS? CALL 1-800-TRIBUNE | SUNDAY, MAY 6, 2012 | BREAKING NEWS AT CHICAGOTRIBUNE.COM

TRIBUNE WATCHDOG

Playing with fire

A deceptive campaign by industry brought toxic flame retardants into our homes and into our bodies. And the chemicals don't even work as promised.



BY PATRICIA CALLAHAN AND SAM ROE
Tribune reporters

Dr. David Heimbach knows how to tell a story.

Before California lawmakers last year, the noted burn surgeon drew gasps from the crowd as he described a 7-week-old baby girl who was burned in a fire started by a candle while she lay on a pillow that lacked flame retardant chemicals.

"Now this is a tiny little person, no bigger than my Italian greyhound at home," said Heimbach, gesturing to approximate the baby's size. "Half of her body was severely burned. She ultimately died after about three weeks of pain and misery in the hospital."

Heimbach's passionate testimony about the baby's death made the long-term health concerns about flame retardants voiced by doctors, environmentalists and even firefighters sound abstract and petty.

But there was a problem with his testimony. It wasn't true. Records show there was no dangerous pillow or candle fire. The baby he described didn't exist.

Neither did the 9-week-old patient who Heimbach told California legislators died in a candle fire in 2009. Nor did the 6-week-old patient who he told Alaska lawmakers was fatally burned in her crib in 2010.

Heimbach is not just a prominent burn doctor. He is a star witness for the manufacturers of flame retardants.

His testimony, the Tribune found, is part of a decades-long campaign of deception that has loaded the furniture and electronics in American homes with pounds of toxic chemicals linked to cancer, neurological deficits, developmental problems and impaired fertility.

The tactics started with Big Tobacco, which wanted to shift focus away from cigarettes as the cause of fire deaths, and continued as chemical companies worked to preserve a lucrative market for their products, according to a Tribune review of thousands of government, scientific and internal industry

stoked the public's fear of fire and helped organize and steer an association of top fire officials that spent more than a decade campaigning for their cause.

Today, scientists know that some flame retardants escape from household products and settle in dust. That's why toddlers, who play on the floor and put things in their mouths, generally have far higher levels of these chemicals in their bodies than their parents.

Blood levels of certain widely used flame retardants doubled in adults every two to five years between 1970 and 2004. More recent studies show levels haven't declined in the U.S. even though some of the chemicals have been pulled from the market. A typical American baby is born with the highest recorded concentrations of flame retardants among infants in the world.

People might be willing to accept the health risks if the

New California Standard

Increased fire safety without flame retardants!

Large Purchasers Move the Market

Material Buyers Club

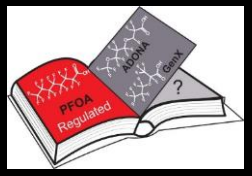
- Require transparency from manufacturers
- Utilize collective purchasing power to create a demand for healthier products and materials

Green Science Policy Science Communication

Study	Journal	Year	Downloads
Flame retardants in baby products	ES&T	2011	24,849
Novel and High Volume Flame Retardants in Couches	ES&T	2012	7,233
Highly fluorinated chemicals in U.S. drinking water	ES&T Letters	2016	49,736
Highly fluorinated chemicals in fast food	ES&T Letters	2017	29,278
Scientific Basis for Managing PFAS as a Chemical Class	ES&T Letters	2020	25,477

Green Science Policy Communications Strategy

- Collaborate with expert authors at multiple institutions.
- Select research topic to support policy in public interest.
- Publish open access.
- After acceptance, select a publication date for maximum impact (Two weeks or more in the future).
- Compose release in accessible language with a "hook".
- Query journalists & then share embargoed release & paper.
- Educate journalists & establish relationships.
- Hope it is not a big news day.
- Utilize paper to affect change.



A Never Ending Story of PFASs
Wang, et al. ES&T 2017, © 2017 ACS

Science + Communication
+ Government & Business =Change

A Healthier Future
With Less Chemicals of Concern

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