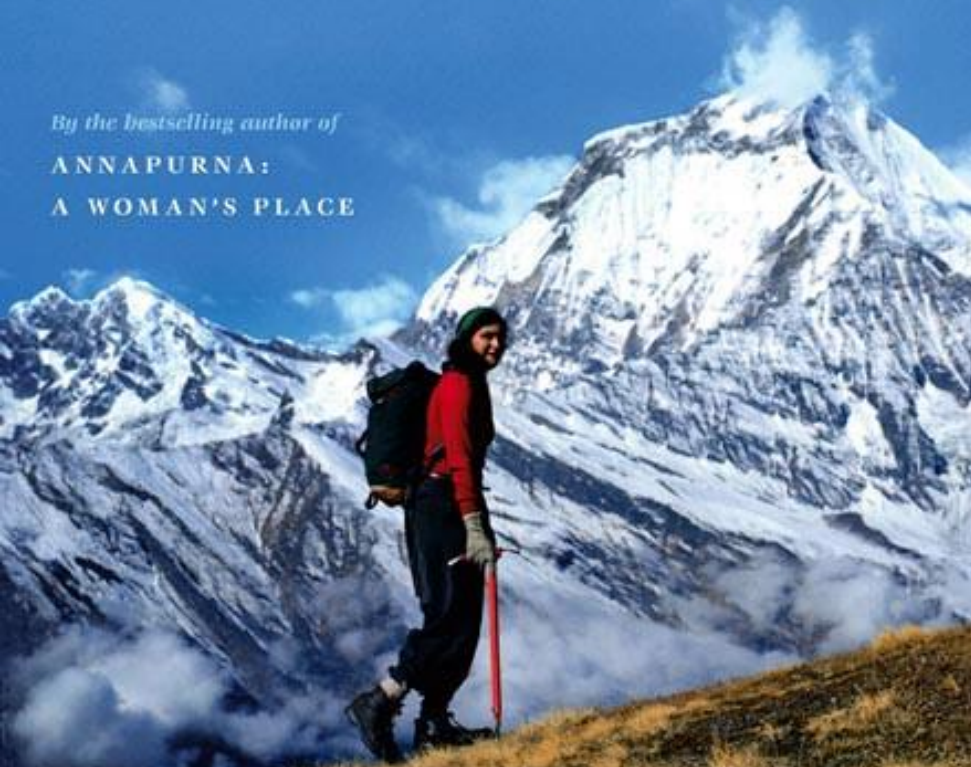


Arlene Blum

BREAKING TRAIL

A Climbing Life

By the bestselling author of
ANNAPURNA:
A WOMAN'S PLACE



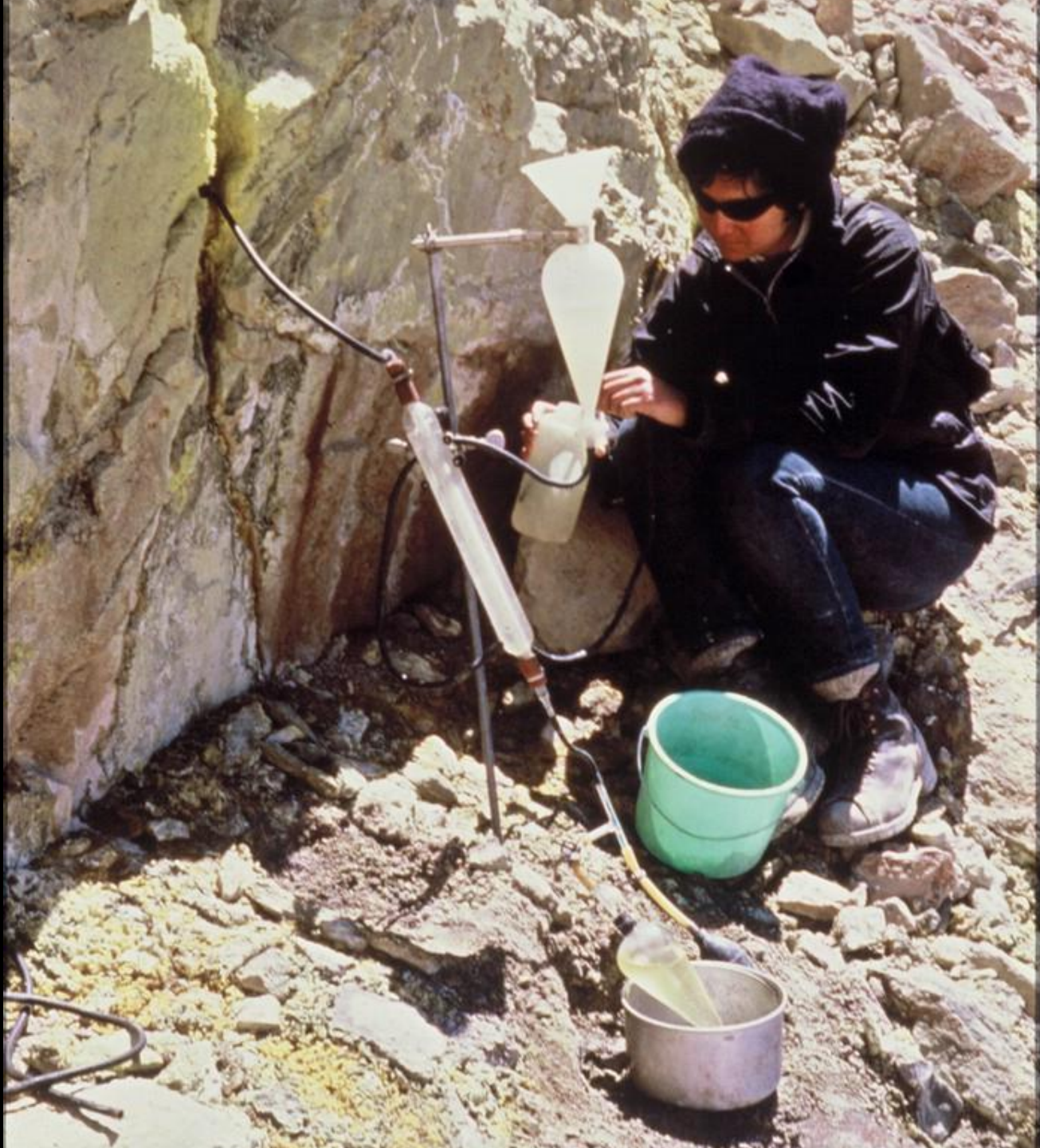
Mountains
And
Molecules



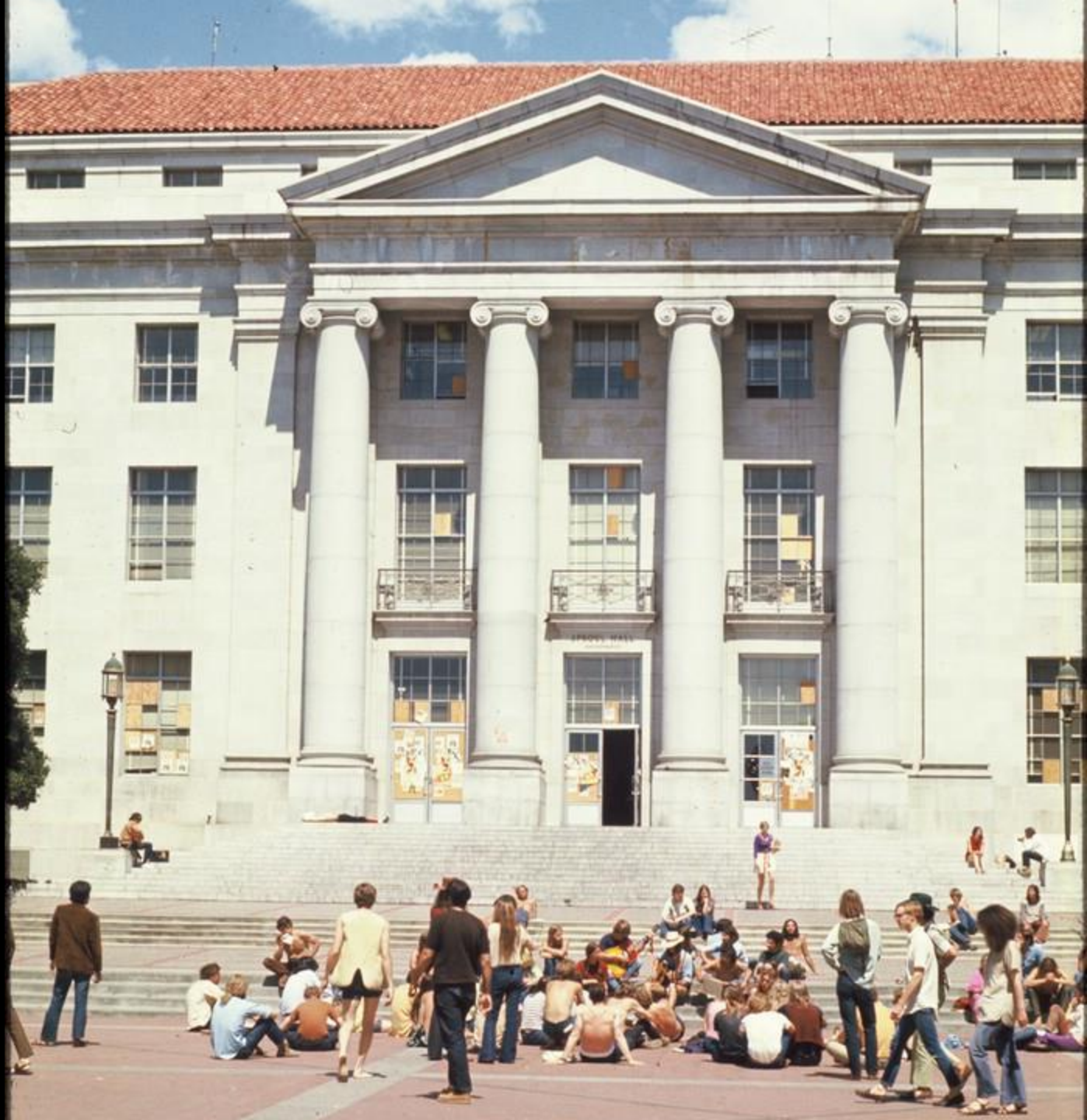




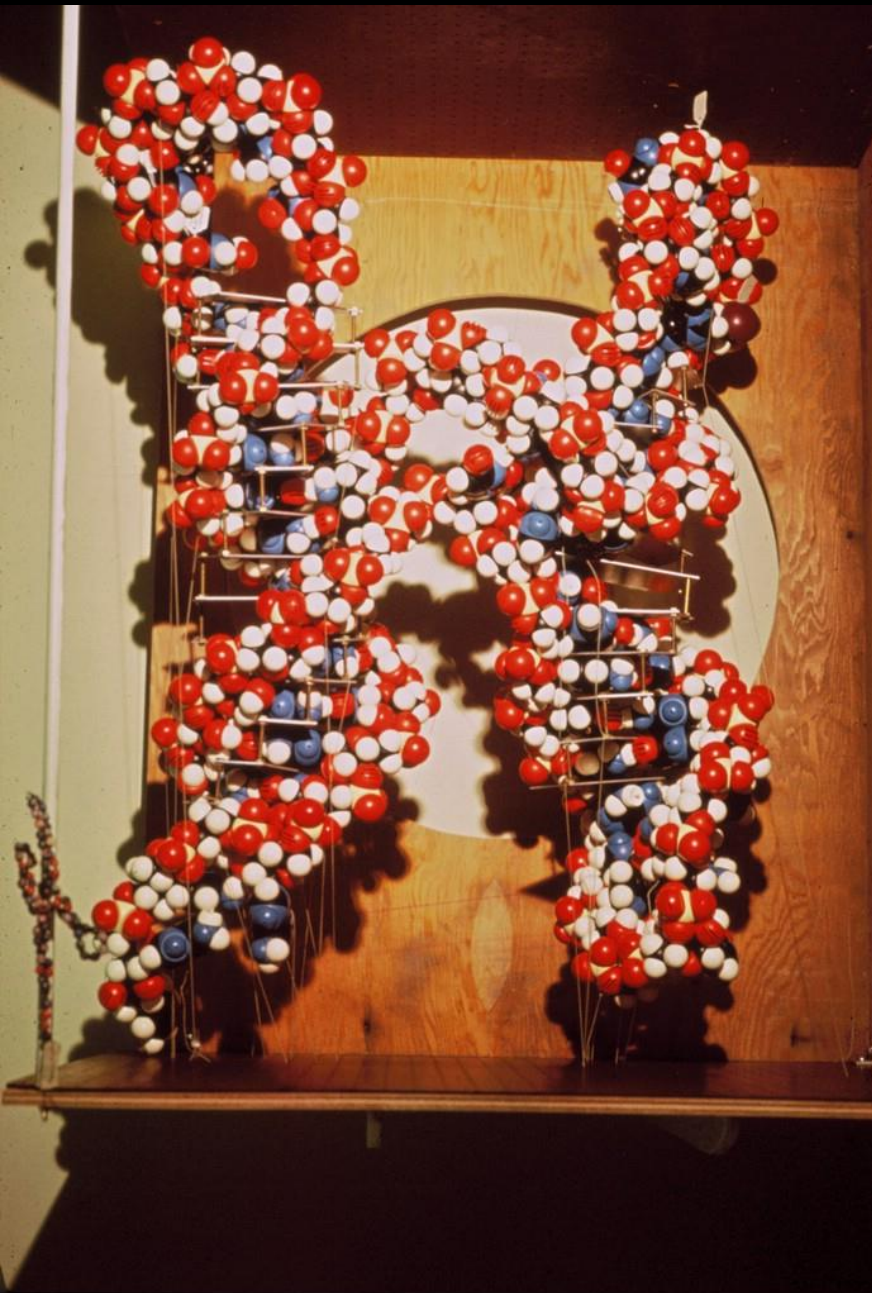












Circular dichroism study of nine species of transfer ribonucleic acid

AD **Blum**, OC Uhlenbeck, I **Tinoco Jr** -
Biochemistry, 1972 - ACS Publications

ABSTRACT: A detailed circular dichroism (CD) study of nine species of tRNA has been done to obtain as much information about the structure of these molecules as possible.







from San Francisco

Route of the Endless Winter

December 1971 to February 1973

to
Great Barrier Reef,
New Zealand Alps
and home

MOUNTAINS CLIMBED	
1	Buahit 14,800' Ras Dashan 15,158'
2	Mt. Stanley – Margarita 16,763' Alexandra 16,708' Albert 16,690'
	Mt. Speke 16,042' Mt. Baker 15,889'
3	Mt. Kenya – Bation and Nelion 17,058'
4	Mt. Kilimanjaro 19,340'
5	Mt. Damavend 18,600' Alum Kuh Mountains
6	Apherwat 13,600' Tuliyen 16,000' Shiva 16,500' Brahma 16,300' Vishnu 16,700' Kistwar Himlal
7	Korpusti-Yaki 18,688' Aspi-Safed 21,300' Noshag to 23,700'
8	Tesi Lapcha Pass 18,880'























Nuclear magnetic resonance evidence for a structural intermediate at an early stage in the refolding of ribonuclease

Arlene D.Blum^{1†}Stephen H.Smallcombe²Robert L.Baldwin¹

[https://doi.org/10.1016/0022-2836\(78\)90230-9](https://doi.org/10.1016/0022-2836(78)90230-9)









Brominated Tris Flame Retardant

Tris (2,3-dibromopropyl) phosphate

- In children's sleepwear 1975 to 1977
- Up to 10% of the weight of fabric
- In children's urine
- Mutagen and possible carcinogen

















Science, January 7, 1977

Flame-Retardant Additives as Possible Cancer Hazards

**The main flame retardant in children's pajamas is a
mutagen and should not be used.**

Arlene Blum and Bruce N. Ames



**U.S. Consumer Product
Safety Commission**

TRIS-Treated Children's Garments Banned

April , 1977

Chlorinated Tris replaced Brominated Tris

- Removed from pajamas in 1978
- Used in furniture until 2012





















































ASIA'S EXPEDITION



LIBRARY OF THE UNIVERSITY OF MICHIGAN



कार्यालय
विवेकानन्द पर्वतीय कृषि
अनुसंधानशाला (अल्मोड़ा)
भारतीय कृषि अनुसंधान परिषद्
OFFICE
VIVEKANANDA LABORATORY
शिवगिरी रोड FOR HILL AGRICULTURE
INDIAN COUNCIL OF AGRICULTURAL RESEARCH













Berkeley Himalayan Fair, Live Oak Park, May 19, 29 , 2018













Annalise's gap year website
<http://www.freewebs.com/gapyearsite>

Annapurna

A WOMAN'S PLACE

The dramatic
story of the first
American ascent of
one of the world's
highest peaks



ARLENE BLUM

20TH ANNIVERSARY EDITION

With a new Preface and Afterword by the author

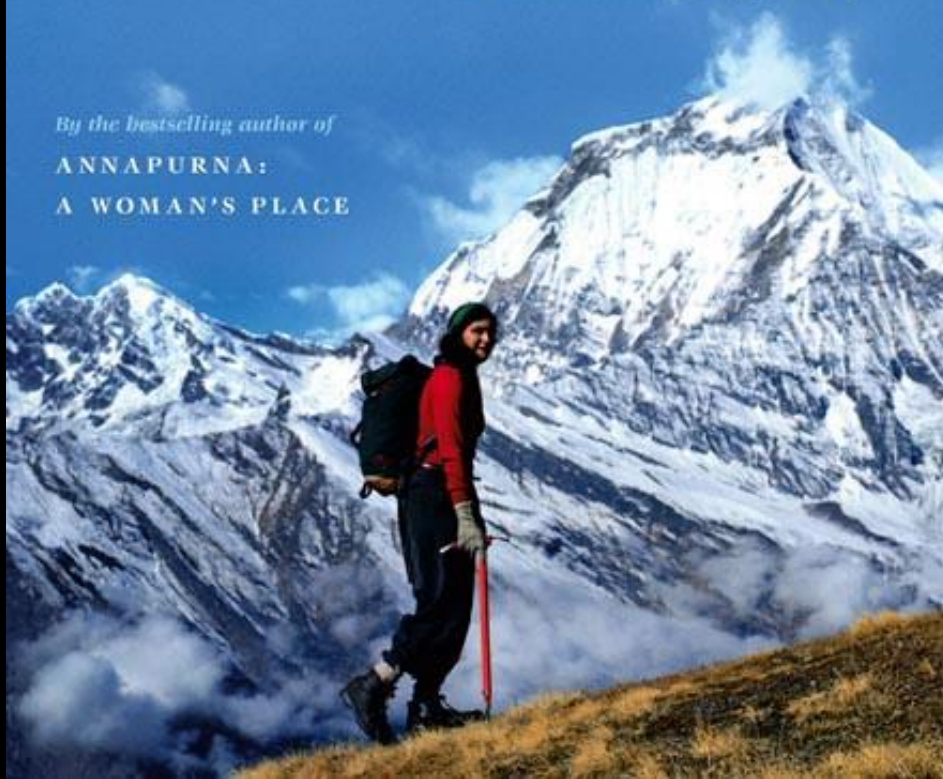
Arlene Blum

BREAKING TRAIL

A Climbing Life

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A WOMAN'S PLACE

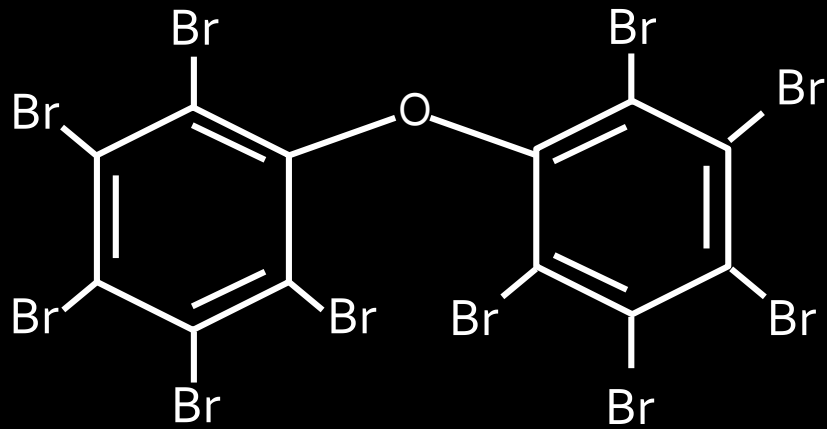


U.S. Toxic Substances Control Act (1976)

- 62,000 previous chemicals “grandfathered”
- 23,000 new chemicals
 - 85% have no health data
 - 67% have no data at all



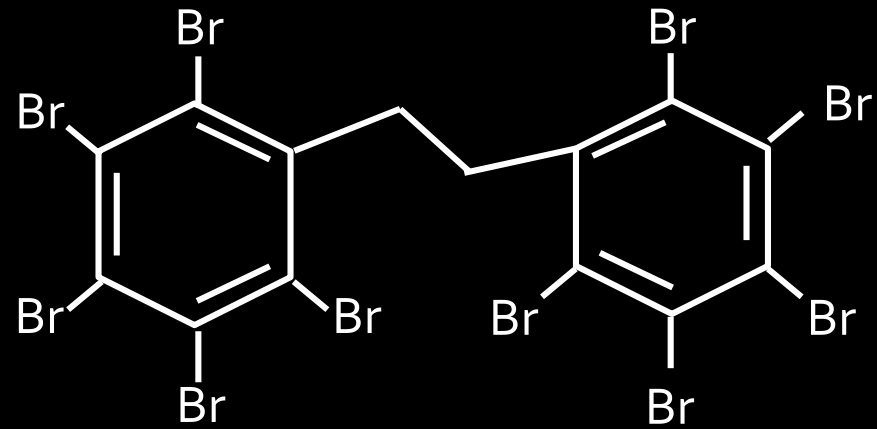
Regrettable Substitution



Decabromodiphenyl
ether

Concerns:

- Persistence
- Bioaccumulation
- Toxicity



Decabromodiphenyl
ethane

Concerns:

- Persistence
- Bioaccumulation
- Toxicity



GREEN SCIENCE POLICY INSTITUTE

ENVIRONMENTAL SCIENCE & TECHNOLOGY
BUILDING RESEARCH & INFORMATION (2022) 48(6):738-755

Building insulation: Using codes

Novel and High Volume Use Flame Retardants in US Couches
Heather M. Thomas F.
Nicholas S.
Departments
Support

Fluorine
Laurel A. Margaret
Silent Sp
Californi
Green
Depart
Enter
Natio
Unit
Che
Ox
Di

ENVIRONMENTAL LETTERS
Science & Technology

Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants
Xindi C. Hu,^{1,2} David Q. Andrews,³ Andrew B. Lindstrom,⁴ Thomas A. Bruton,⁴ Laurel A. Schaidt,⁴ Philippe Grandjean,⁵ Rainer Lohmann,⁶ Courtney C. Carignan,⁷ Arlene Blum,^{1,3} Simona A. Balan,⁸ Christopher P. Higgins,⁹ and Elsie M. Sunderland^{1,2}

¹Harvard T. H. Chan School of Public Health, Boston, Massachusetts 02215, United States
²Harvard John A. Paulson School of Engineering and Applied Sciences, Cambridge, Massachusetts 02138, United States
³Environmental Working Group, Washington, D.C. 20009, United States
⁴National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, United States
⁵University of California at Berkeley, Berkeley, California 94720, United States
⁶Silent Spring Institute, Newton, Massachusetts 02460, United States
⁷University of Rhode Island, Narragansett, Rhode Island 02882, United States
⁸Green Science Policy Institute, Berkeley, California 94705, United States
⁹California Department of Toxic Substances Control, 1001 I Street, Sacramento, California 95814, United States (Formerly at the Green Science Policy Institute, Berkeley, California 94705, United States)
¹⁰Colorado School of Mines, 1500 Illinois Street, Golden, Colorado 80401, United States

Supporting Information

ABSTRACT: Drinking water contamination with poly- and perfluoroalkyl substances (PFASs) poses risks to the developmental, immune, metabolic, and endocrine health of consumers. We present a spatial analysis of 2013–2015 national drinking water PFAS concentrations from the U.S. Environmental Protection Agency's (U.S. EPA) third Unregulated Contaminant Monitoring Rule (UCMR3) program. The number of industrial sites that manufacture or use these compounds, the number of military fire training areas, and the number of wastewater treatment plants are all significant

Hydrological units with detectable PFASs

Meaning the drinking water

Meaning the drinking water



Education



Research

Retreats

Policy & Purchasing Change

Six Classes Videos

An innovative approach to reducing toxics

1

Highly
Fluorinated

2

Antimicrobials

3

Flame
Retardants

4

Bisphenols
+ Phthalates

5

Some
Solvents

6

Certain Metals



VIEW and SHARE: www.SixClasses.org

Healthier products, healthier people in four minutes!

Six Classes Videos

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Solvents

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Certain Metals



VIEW and SHARE: www.SixClasses.org

Healthier products, healthier people in four minutes!

Is it necessary?

Is it worth it?

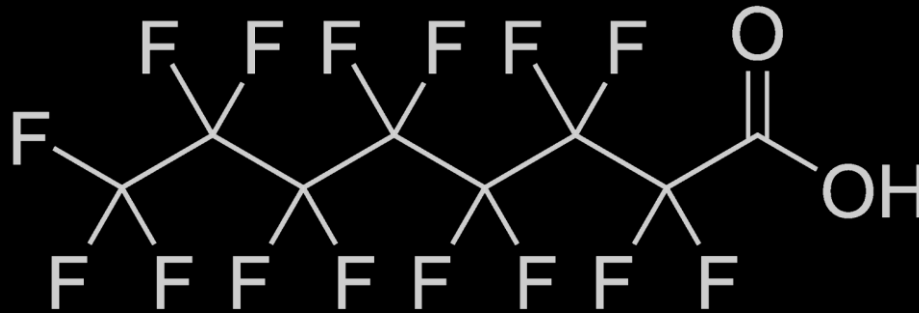
Is there a safer alternative?

Classes 1 to 3

Class 1: Highly Fluorinated Chemicals (PFAS)

Carbon-Fluorine bond strength:

- Leads to oil and water repellency
- Lasts for geologic time!



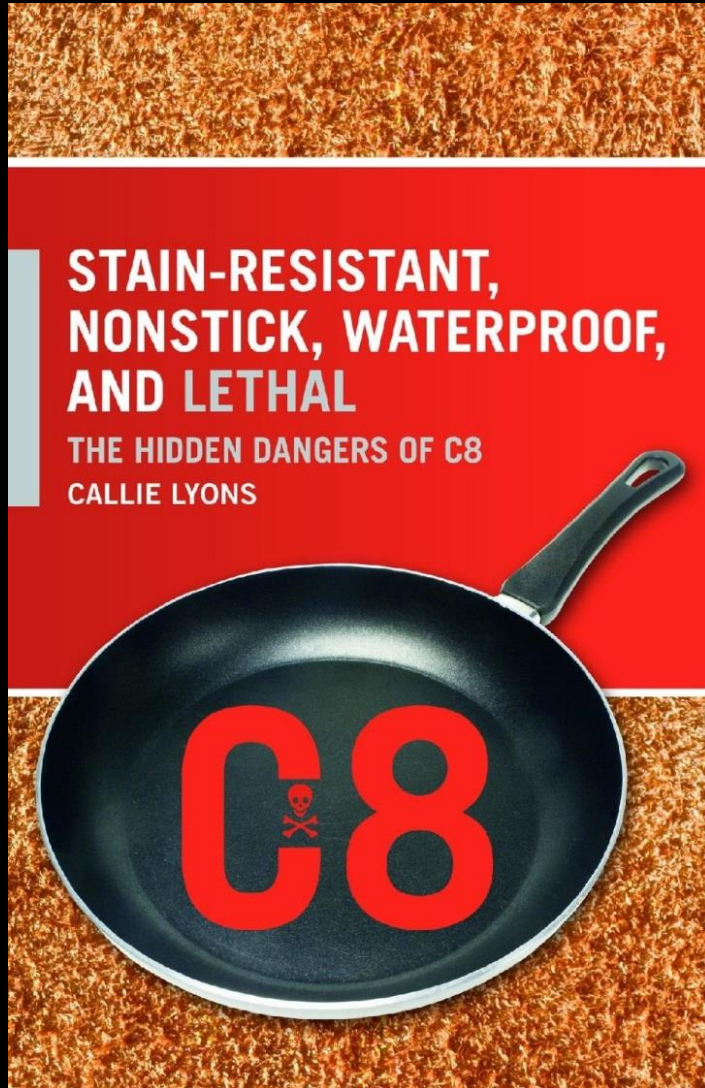
PFAS Exposure is a health concern



Exposure linked to health risks:

Kidney and testicular cancer, elevated cholesterol, obesity, immune suppression, and endocrine disruption

Published 2007



2017

Watershed

Tracy K. Smith

US Poet Laureate

200 cows more than 600 hilly
acres
property would have been even
larger
had J not sold 66 acres to DuPont
for
waste from its
Washington Works factory
where J was employed
did not want to
sell
but needed money poor
health
mysterious ailments

Common Uses



CARPETS



CARPET CLEANING PRODUCTS



FOOD PACKAGING



FURNISHINGS



COSMETICS



OUTDOOR GEAR



CLOTHING



ADHESIVES AND SEALANTS



PROTECTIVE COATINGS



NON-STICK COOKWARE



CARSEATS



FIREFIGHTING FOAM

May 2015 The Madrid Statement on Highly Fluorinated Chemicals



“We call on the international community to cooperate in limiting the production and use of PFASs and in developing safer non-fluorinated alternatives.”

Signed by 230 scientists from 40 countries

2015: Environmental Health Perspectives

2015-16

The Opinion Pages | OP-ED COLUMNIST

The New York Times

Chemicals in Your Popcorn?

JUNE 4, 2015



Nicholas Kristof

What do a pizza box, a polar bear and you have in common?

All carry a kind of industrial toxicant called poly- and perfluoroalkyl substances, or PFASs, that do two things: They make life convenient, and they also appear to increase the risk of cancer.

These Chemicals in Pizza Boxes and Carpeting Last Forever

More than 200 scientists around the world document the threats of perfluorinated compounds and call for more government control.

By **Lindsey Konkel**, National Geographic
PUBLISHED MAY 01, 2015



 NATIONAL
GEOGRAPHIC

The
Intercept_

THE TEFLON TOXIN

DuPont and the Chemistry of
Deception



Sharon Lerner

Aug. 11 2015, 3:35 p.m.



133

Home

The New York Times Magazine

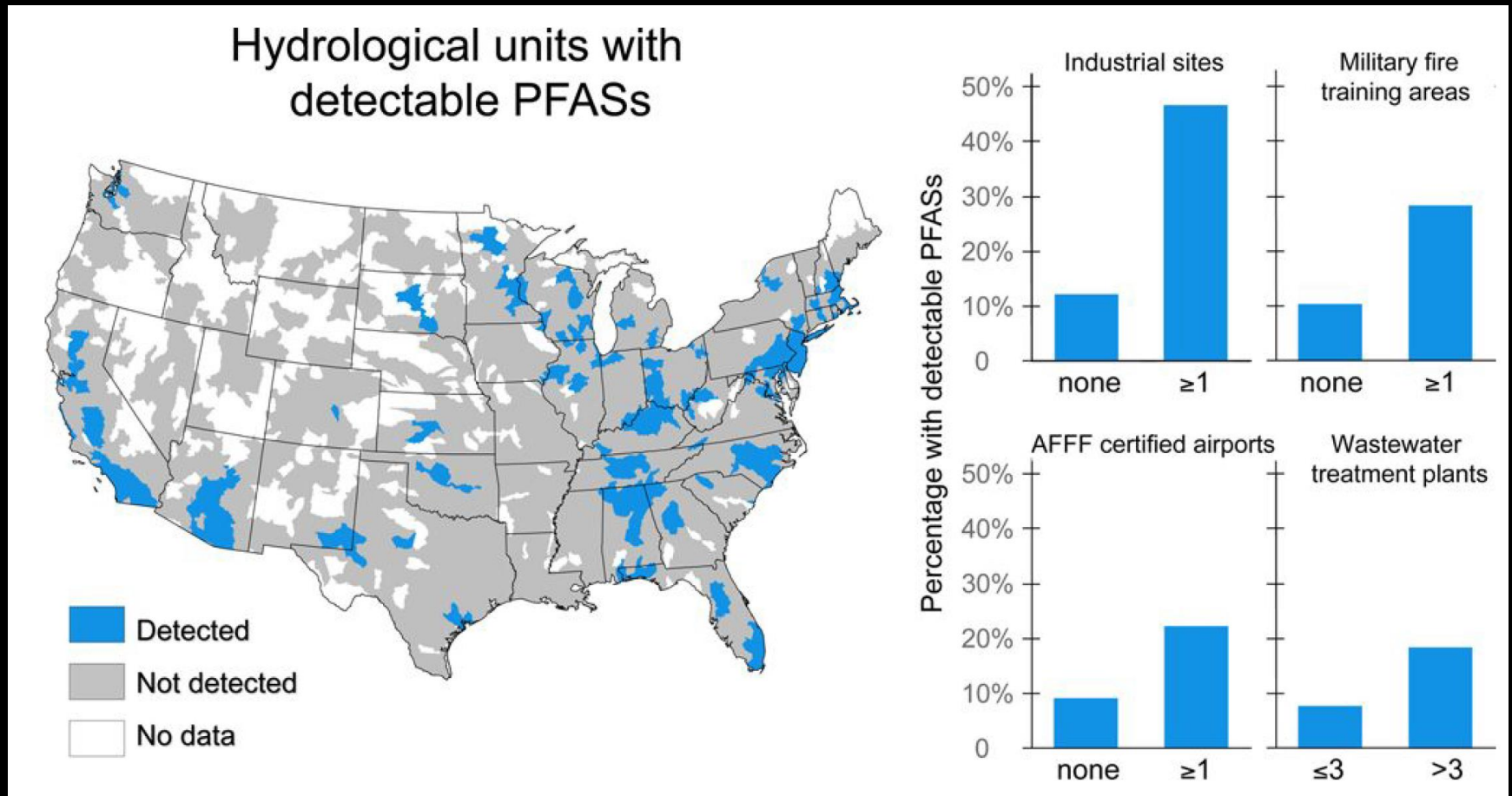
The Lawyer Who Became DuPont's Worst Nightmare

Rob Bilott was a corporate defense attorney for eight years. Then he took on an environmental suit that would upend his entire career — and expose a brazen, decades-long history of chemical pollution.

By NATHANIEL RICH JAN. 6, 2016

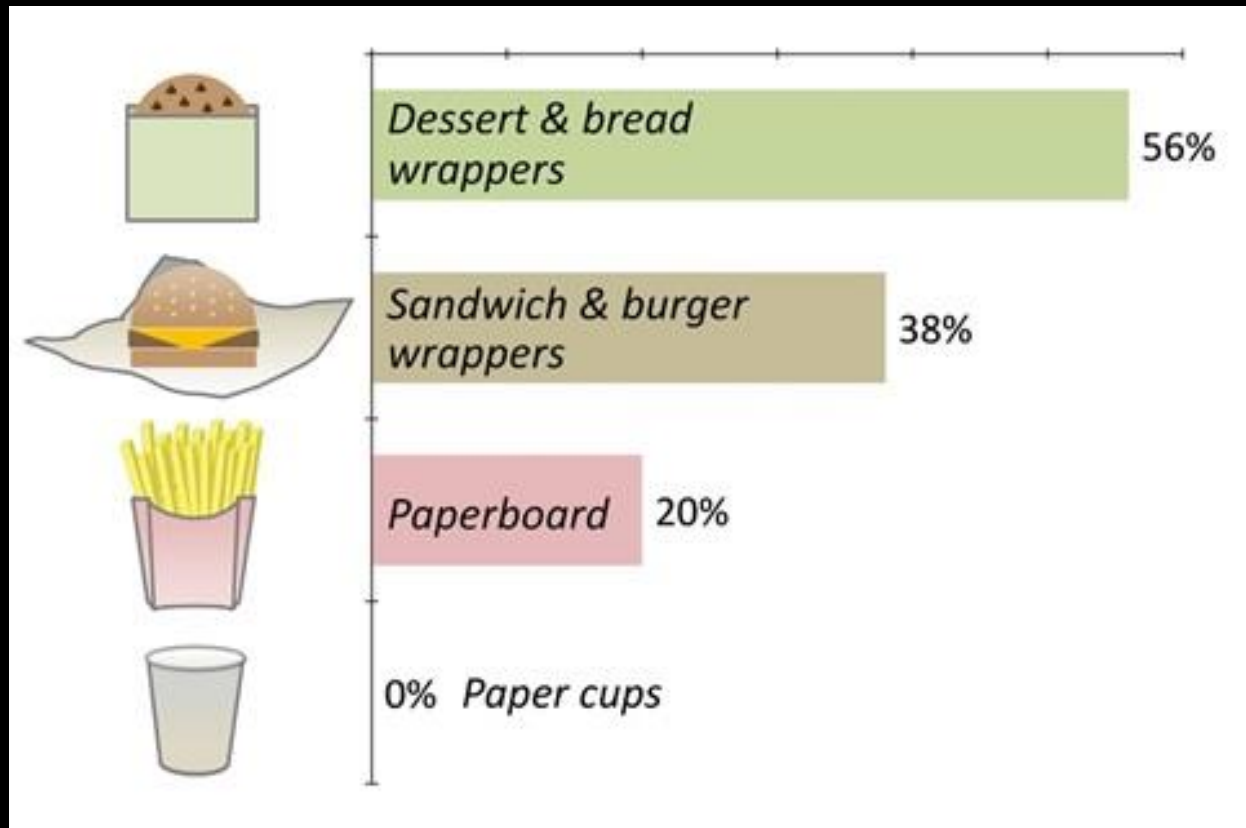


EPA Lifetime Health Advisory Level of 70 ng/L PFOA + PFOS



Fluorine in U.S. fast food packaging paper

(percent positive; 400 products sampled)



Adopted from Schaider L. 2016 *Fluorinated compounds in U.S. fast food packaging*.

Should these products be considered compostable?

Washington State's Healthy Food Packaging Act signed March 21, 2018



HB 2658/SB 6396 passes
House on a 30-17 vote

Bans paper food packaging
containing any PFAS

BRANDS ARE ELIMINATING HIGHLY FLUORINATED CHEMICALS

IKEA

H&M

Crate&Barrel

LEVI STRAUSS & CO.

PUMA

benetton

ESPRIT

adidas®

MARKS &
SPENCER

MANGO

BURBERRY®
LONDON

ZARA

CA proposal to list carpets with any PFAS

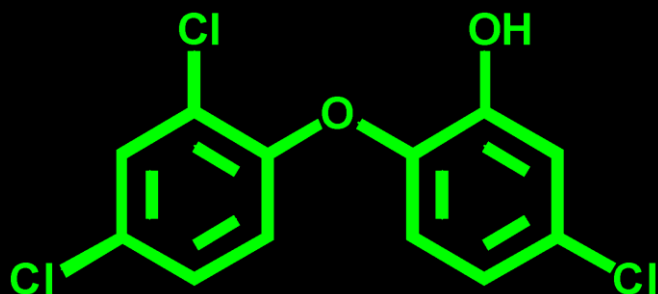
February 15, 2018



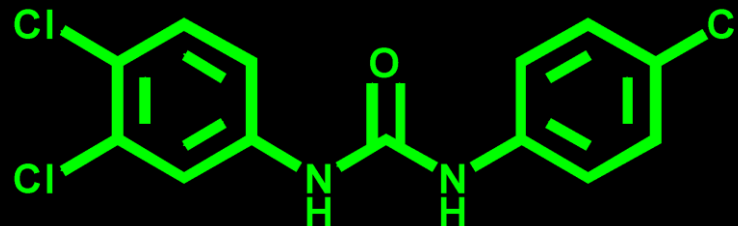
The CA Department of Toxic Substances Control is proposing to list carpets & rugs containing **any PFAS** as priority products for regulation.

Class 2: Antimicrobials

Triclosan

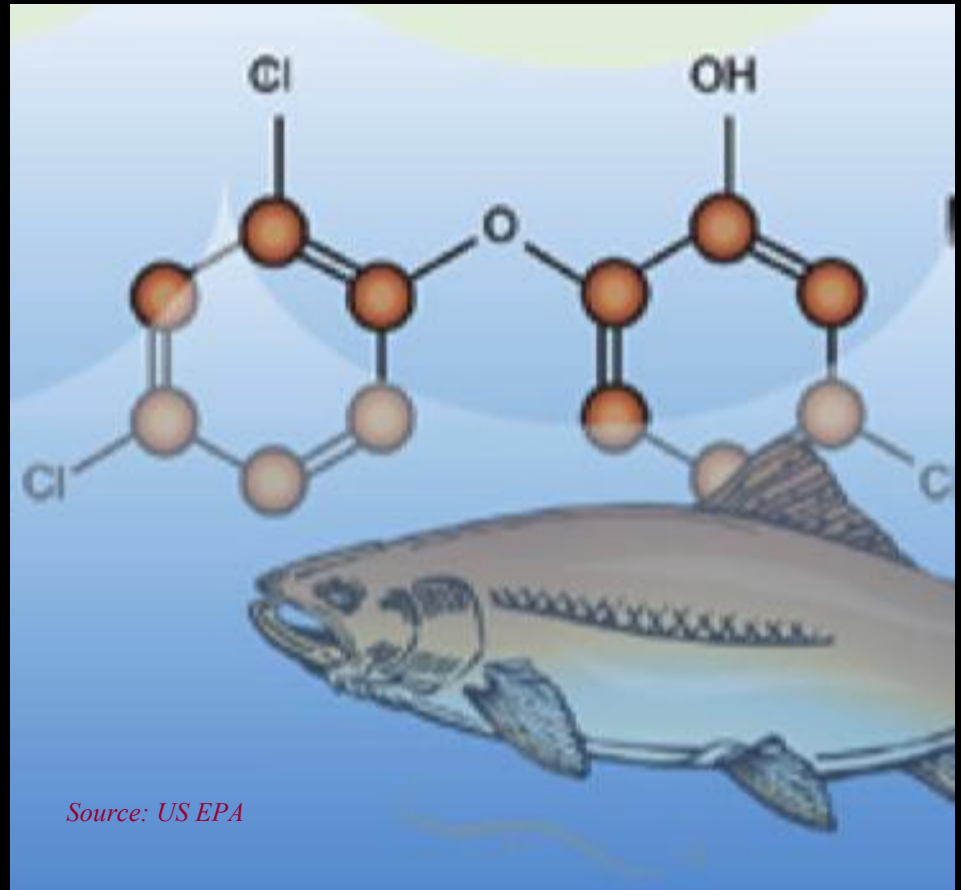


Triclocarban





5 – 10 Seconds
(ineffective)



**Lifetime exposure in
aquatic organisms**
(toxic)

The Florence Statement on Triclosan and Triclocarban



Documents the scientific consensus about:

- potential for harm
- recommendations to prevent further harm

Signed by 205 international scientists

Class 3 Flame retardants

1970s Flammability Standards

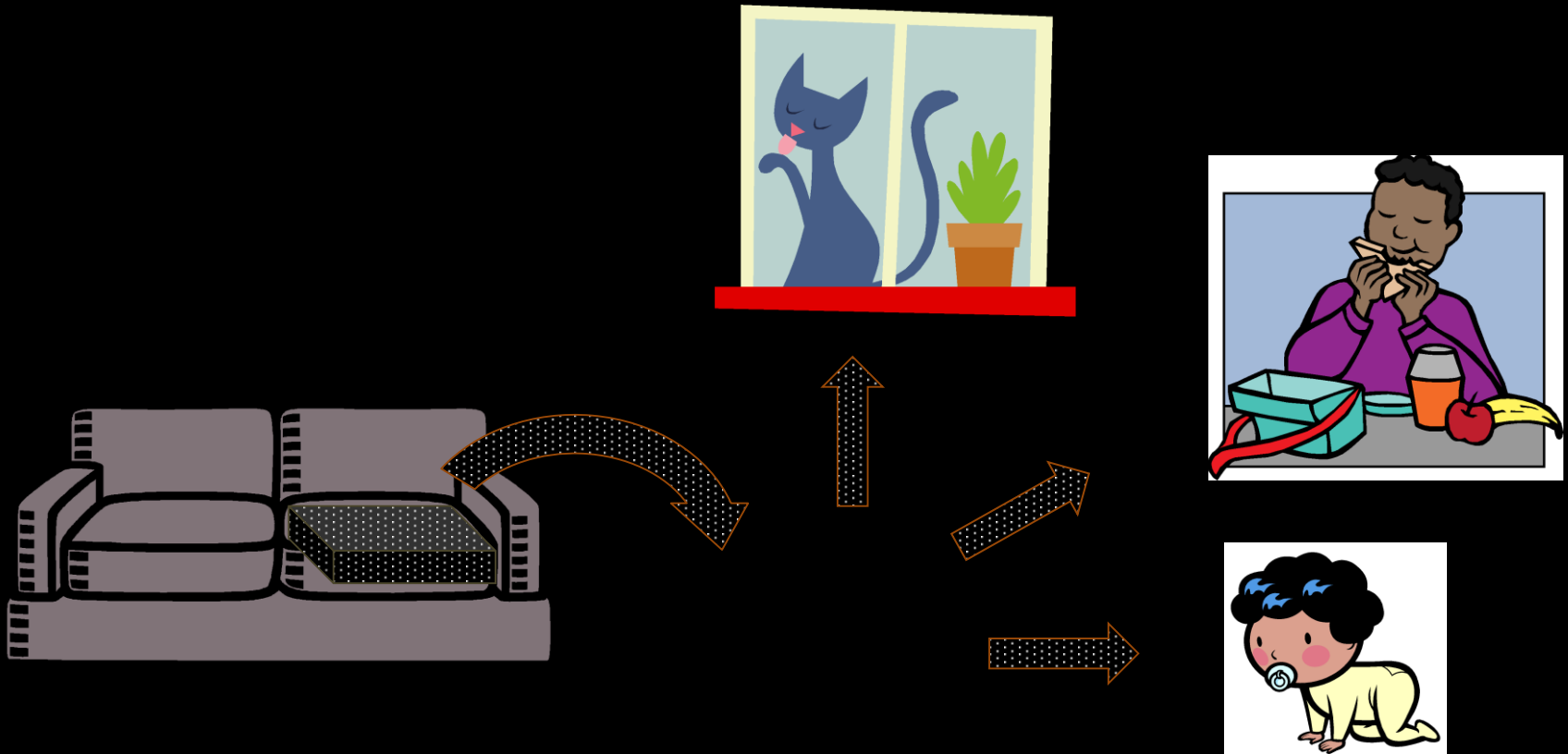
- Children's sleepwear
- Furniture and baby product foam
- Foam building insulation

Technical Bulletin 117



- Required furniture foam to withstand a small open flame for 12 seconds
- No significant fire safety benefit (fires start in exterior fabric not filling)

From Products to People



Furniture foam flame retardant (PentaBDE) associations with human health problems – all reported after 2005

Higher pentaBDE exposures
associated with:



Increased time to pregnancy
Altered thyroid hormone
Thyroid disease, esp. in post-menopausal women

Developmental toxicity

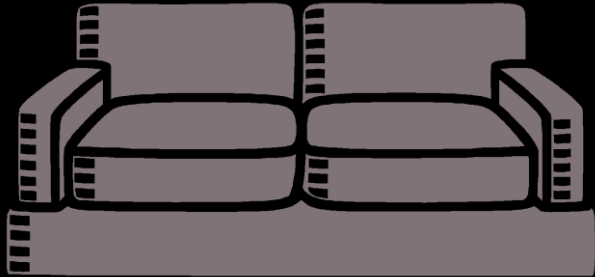
Baby boys' genital problems
Lower birth weight
Impaired attention
Poorer coordination
Lower IQ
Delayed puberty in girls
Earlier puberty in boys



*Main et al. 2007; Goodyer et al 2017;
Eskenazi et al., 2010, 2011, 2012; Herbstman et
al. 2010; Makey et al. 2016; Windham et al.
2015; Harley et al. 2017; Allen et al. 2016*

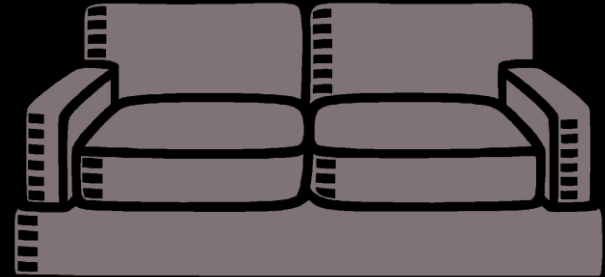
TB117 Fire Safety Benefit?

TB117 foam



~

Non - TB117 foam



“No significant, consistent difference...”

Increased fire safety without flame retardants



Assembly Bill 706, Senate Bill 772, Senate Bill 1291, Senate Bill 147



Paid for by Californians for Fire Safety:

- Albemarle
- Chemtura
- Israel Chemicals LTD (ICL)

Pulitzer Prize

Finalist

Goldsmith Prize

Investigative Reporting

Environmental

Journalists Society

Environmental Reporting

Gerald Loeb Award

Business and Financial Journalism

National Press Club

Consumer Award

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



California Flammability Standard TB117-2013

Mandatory January 1, 2015

**Flame retardants not needed,
but can still be used**

Product Labels Required

NOTICE

THIS ARTICLE MEETS THE FLAMMABILITY REQUIREMENTS OF CALIFORNIA BUREAU OF ELECTRONIC AND APPLIANCE REPAIR, HOME FURNISHINGS AND THERMAL INSULATION TECHNICAL BULLETIN 117-2013. CARE SHOULD BE EXERCISED NEAR OPEN FLAME OR WITH BURNING CIGARETTES.

The upholstery materials in this product:

 contain added flame retardant chemicals

 X contain NO added flame retardant chemicals

The State of California has updated the flammability standard and determined the fire safety requirements for this product can be met without adding flame retardant chemicals. The State has identified many flame retardant chemicals as being known to, or strongly suspected of, adversely impacting human health or development.

Six Classes Videos

An innovative approach to reducing toxics

1

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Fluorinated

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Antimicrobials

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Flame
Retardants

4

Bisphenols
+ Phthalates

5

Some
Solvents


6

Certain Metals



VIEW and SHARE: www.SixClasses.org

Healthier products, healthier people in four minutes!

A high-altitude mountain peak, likely snow-capped, with a climber visible on the slope. The sun is shining brightly in the upper left corner, creating a lens flare effect. The sky is a deep blue.

For monthly e-newsletters,
give Arlene your card or
sign our mailing list

**This talk will be
under Past Events at
www.GreenSciencePolicy.org**



By limiting use of the Six Classes

We can have a healthier world.

**For more information:
Green Science Policy Institute
www.greensciencepolicy.org**