Toxic-Free Children's Act

Protecting Alaska's Children from Exposure to Toxic Chemicals

ACAT Alaska Community Action on Toxics

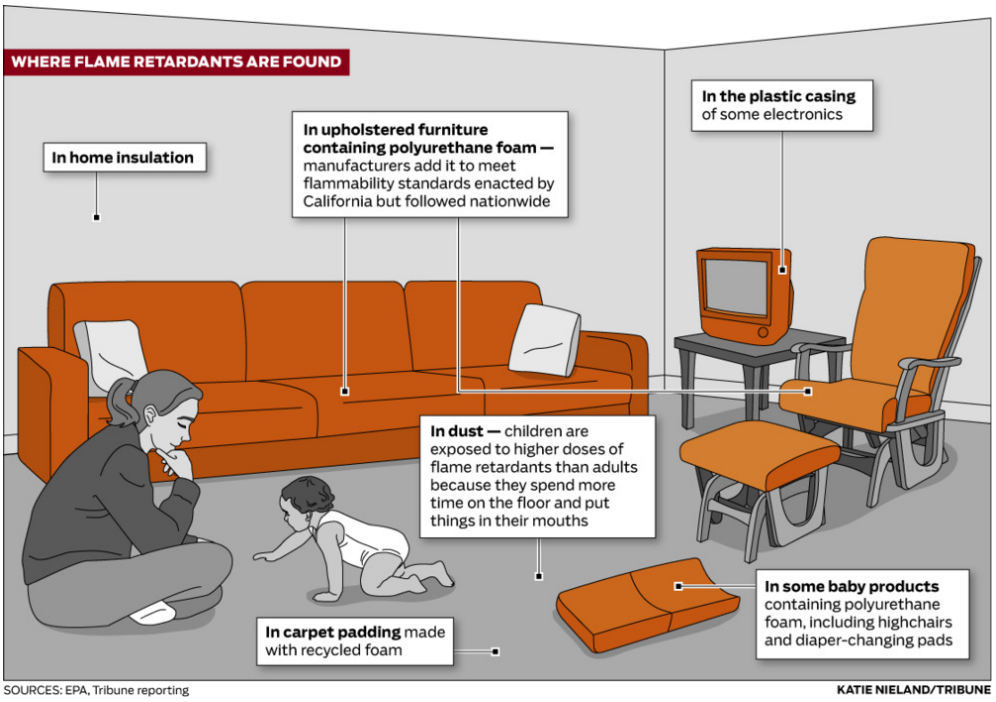
Key Science on Toxic Flame Retardants February 2015

The Toxic-Free Children's Act will prevent the manufacture, sale, and distribution of ten toxic and unnecessary flame retardant chemicals in children's products and home furniture. It will also require the labelling of children's products and upholstered furniture to inform people whether these products contain toxic flame retardant chemicals.

Chemical flame retardants are widely used in children's products, carpeting, and home furniture. These harmful chemicals are found in toys, nap mats, nursing pillows, changing pads, baby carriers, carpet padding, and upholstered furniture foam. Under current federal law, these toxic chemicals are virtually unregulated for their safety. Yet, these chemicals pose a serious public health threat, are particularly toxic to children, and do not provide a fire safety benefit. They have a range of adverse toxicological effects, including cancer, learning disabilities, developmental impairment, and reproductive harm.

Toxic flame retardants are of particular concern in Alaska because they are persistent and tend to accumulate in the fish, wildlife, and people living in our northern environment. People, especially children, may also be more highly exposed in indoor environments, because our homes are more insulated against the cold and may be less well ventilated than in lower latitudes.

Below is a short summary of the scientific research concerning toxic effects of each of the ten flame retardants included in this bill:



Antimony

Health effects:

- Causes cancer—the International Agency for Research on Cancer (IARC) determined that there is sufficient evidence of the carcinogenicity of antimony trioxide in experimental animals, and that antimony is a probable human carcinogen (Group 2B).[1] It is also listed by the State of California as a chemical known to cause cancer.[2]
- Associated with miscarriages and premature births in exposed women workers.[3]

Where found:

- Used in children's toys, clothing, changing mats, and certain plastics;
- Persistent in the environment; detected in household dust;

- Found in human breast milk and umbilical cord blood.[4]

Chlorinated paraffins

Health effects:

- Causes cancer—the 11th Report on Carcinogens determined that chlorinated paraffins are reasonably anticipated to be human carcinogens based on sufficient evidence of carcinogenicity in experimental animals.[5]
- Liver toxicity in experimental animals;
- Reduced survival and body weight of developing babies in animal studies.[6]

Where found:

- Used as flame retardants in PVC and other plastics, paints, and sealants;
- Persistent, bioaccumulative, and found worldwide in the environment, wildlife, and humans;[7]
- Toxic to aquatic organisms at low concentrations;
- Found in human breast milk, including Indigenous women of the Arctic.[8]

Deca–BDE (decabromodiphenyl ether)

Health effects:

- Endocrine disruption, particularly thyroid function; and reproductive toxicant in laboratory studies;
- Adverse neurodevelopmental effects in laboratory and human studies, including mental development and cognition.[9]

Where found:

- Used as a flame retardant in electronics such as TVs and computers, and in carpets, inks, and sealants;
- Persistent and toxic chemical; one of the most prevalent of the brominated flame retardants in the global environment; detected in fish and wildlife of the Arctic;[10]
- Found in children's toys, indoor air, and household dust; [11]
- Found in human blood serum, cord blood, placenta, and breast milk.[12]

HBCD (hexabromocyclododecane)

Health effects:

- Reproductive harm in Arctic birds at environmental levels, including egg shell thinning;[13]
- Studies of mammals have shown reproductive, developmental, and behavioral effects with some of the effects being trans-generational;[14]
- Endocrine disruption, specifically with adverse effects to thyroid function, and a developmental neurotoxicant in laboratory studies.[15,16]

- Causes cancer in laboratory animals;[17]

Where found:

- Used as a flame retardant in furniture upholstery and in polystyrene insulation foam;
- Found in household dust, indoor air, and food;
- Bioaccumulative, persistent, and toxic;
- Found in human blood serum, cord blood, and breast milk.[18]

TBB (2-ethylhexyl-2,3,4,5-tetrabromobenzoate) and TBPH (bis(2-ethylhexyl)-3,4,5,6-tetrabromophthalate)

Health effects:

- Damage to DNA in fish;[19]
- Endocrine disruption found in laboratory studies of the flame retardant mixture Firemaster 550 that includes TBB and TBPH;[20] TBPH affects thyroid hormone (T3); and TBPH and TBB affect reproductive hormones.[21]

Where found:

- Both TBB and TBPH are found in household dust, air, and biota; TBPH is found in environmental samples from the high Arctic;
- TBB and TBPH are high production volume chemicals, components of the chemical flame retardant Firemaster 550, and found in polyurethane foam used in baby products such as nursing pillows and changing pads, and in couch foam.[22]

TBBPA (tetrabromobisphenol A)

Health Effects:

- May affect endocrine system, including thyroid hormone and estrogen levels;
- Causes uterine tumors in laboratory animals.[23]

Where Found:

- Used in circuit boards for electronics such as TVs, computers, and cell phones; accounts for 59% of all brominated flame retardants used worldwide;[24]
- Found in household dust, biota, and human breast milk.

TCEP (tris(2-chloroethyl)phosphate)

Health Effects:

- Exposure to TCEP increases cancer risk and is linked to adverse reproductive and neurological effects;[25,26,27,28]
- Classified by the European Chemicals Agency as a Substance of Very High Concern in 2010 due to its reproductive toxicity and potential to impair fertility;[29]

- Classified by the State of California as a known cancer-causing chemical;[30]
- Causes tumors of the kidney and liver as well as brain abnormalities in animal studies.[31,32]

Where Found:

- Flame retardant chemical added to foam in baby products, furniture, carpet backing, and vinyl products;
- Found in such products as nursing pillows, baby carriers, and portable cribs;[33]
- Found in indoor air, household dust, and surface waters.

TCPP (tris(1-chloro-2-propyl)phosphate)

Health Effects:

- Chemically similar to other tris chemicals;
- Possible carcinogen, disrupts red blood cells, and irritates the skin.[34]

Where Found:

- Found in a range of baby products including changing pads, sleep positioners, nursing pillows, car seats, and portable mattresses;[35]
- Detected in household dust and in environmental samples;

TDCPP (tris(1,3-dichloro-2-propyl)phosphate)

Health Effects:

- Causes cancer in laboratory studies;[36] listed by the State of California as a known cancer-causing chemical;[37] and associated with increased incidence of tumors in laboratory studies;[38,39]
- Reduces semen quality, alters hormone levels,[40,41] and causes DNA mutations;[42]
- TDCPP is a potent neurotoxicant in laboratory studies;[43,44]
- Abnormal development in fish.[45]

Where Found:

- TDCPP was widely used in children's pajamas in the 1970s until it was eliminated from that use due to its adverse health effects; now used in children's products and furniture;
- The most common flame retardant detected in baby products in a 2011 Duke University peer-reviewed study detected in 36% of 101 items tested);
- Found in household dust and urine samples.

Endnotes

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