

Letter to the Editor

FLAME RETARDANT TROUBLES ATTRIBUTABLE TO WEAK CHEMICAL REGULATIONS

News broke in early December 2010 that scientists at the University of Texas School of Public Health found extremely high levels of a class of recently banned flame retardants, polybrominated diphenyl ethers (PBDEs), in brand-name butter.¹ This finding added fuel to the current controversy regarding the widespread use of flame retardants in consumer products and their presence in our homes, bodies, and the environment. More than 200 scientists and physicians from 30 countries have joined together to tell the world that the hazards of flame retardants (particularly the PBDEs and their replacements) to our health warrant urgent concern.²

However, the fight against flame retardants is nothing new—scientists have questioned the use of these chemicals since the 1930s.³ And though the formulations have changed from time to time, they are still used in our furniture, baby products, and electronics. The trouble is that the chemicals migrate from these products into house dust, which is ingested by people, especially small children who are closer to the floor and exhibit more hand-to-mouth activity.⁴ High body levels of flame retardants are associated with rising rates of reproductive and endocrine problems (including reduced fertility^{5,6} and altered thyroid function⁷), neurodevelopmental problems in children (such as reduced IQ⁸ and possibly autism⁹), and certain types of cancer.^{10,11} Moreover, there are no data to show that the addition of these chemicals to our furniture provides any fire safety benefit. In fact, in house fires, flame retardants increase the amount of toxic gas produced,¹² which is the cause of most fire deaths.¹³

The PBDEs and their replacements are just the most recent installment in a legacy of similar flame retardant chemicals whose intrinsic and studied toxic properties were discounted before attracting sustained regulatory attention.¹⁴ Because of weaknesses in the law that regulates industrial chemicals, the Toxic Substances Control Act (TSCA) of 1976, neither federal nor state environmental protection agencies have adequate authority to require that manufacturers ensure their flame retardant chemicals are safe for human health.

First, TSCA requires that chemicals do not pose “an

unreasonable risk of injury to health or the environment” and that any regulation enacted should control the unreasonable risk to the extent necessary using the “least burdensome” means of control.¹⁵ This legal standard for demonstrating that a chemical is likely to cause harm to human health or the environment is too burdensome and has prevented the U.S. Environmental Protection Agency (EPA) from banning even the most notorious of all types of flame-retardant chemicals: asbestos.

Second, TSCA affords no incentive for use of existing alternative designs or materials or the development of green chemistry alternatives. It is beneficial for manufacturers to exploit their existing expertise, equipment, and patents so that production tends to shift from one compound to another based on structural similarities.¹⁶ Because of this, after 30 years of widespread use, several flame retardants have been banned or phased out because of their environmental persistence and toxicity, only to be replaced by chemicals of similar structure. For example, in the late 1970s, a chemical called brominated Tris was used to treat children’s sleepwear until it was found to cause DNA mutations and to be absorbed into children’s bodies after one night of wearing brominated Tris-treated pajamas.¹⁷ When it was banned for use in sleepwear by the Consumer Product Safety Commission, chlorinated Tris was the main replacement. Chlorinated Tris was voluntarily removed from use in sleepwear a year later when, unsurprisingly, it was also shown to be a mutagen and carcinogen. However, today chlorinated Tris is used in furniture and certain baby products to comply with a California flammability standard.

Perhaps the most famous instance of this pattern was in the early 1970s, when the toxic polychlorinated biphenyls (PCBs) were beginning to be phased out and replaced by their bromine analogs, the polybrominated biphenyls (PBBs).¹⁸ Although the toxicity of PBBs should have come as no surprise, PBBs were used until a 1973 accidental mixing of PBBs with feed for livestock in Michigan resulted in the exposure of farm animals and more than nine million people.¹⁹ PBB toxicity became apparent when livestock exhibited weight and hair loss, abnormal hoof growth, abortions, and stillbirths.²⁰ Production of PBBs was not officially banned until 1976. Twenty years later, human epidemiology studies of the exposed cohort have demonstrated various adverse reproductive associations.²¹

Lastly, TSCA does not require (or allow EPA to

require) chemical producers to provide even a minimum base set of data on a chemical's environmental fate or toxicity. This prohibits the EPA from disclosing any information designated by a submitter as confidential business information, not only to the general public but also to state and local governments.²² Manufacturers are not required to label products to indicate the presence of flame retardants, rendering consumers unable to avoid exposure or exert consumer influence on the chemicals in products.

The history of flame retardant usage in consumer products illustrates that TSCA has placed the burden of proving chemical safety on consumers and the government instead of the chemical producers. This April, U.S. Senator Frank Lautenberg (D-NJ) introduced the Safe Chemicals Act of 2011, which will modernize TSCA by requiring chemical manufacturers to demonstrate the safety of industrial chemicals used in consumer products. If this or similar legislation is implemented this year, the EPA will have more ability to protect human health and the environment from toxic chemical groups such as flame retardants and provide the necessary incentive to move the U.S. chemicals market toward green chemistry.

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