SPOTLIGHT ON FLAME RETARDANTS

Flame retardants are added to many products in order to meet flammability standards, since they can slow the growth of fire when used at very high concentrations. However, there is a solid body of evidence that many flame retardants can be toxic to human health, whereas their actual impact on fire safety is hotly contested.

Some of the most toxic flame retardants include the class of organohalogen substances, such as the polybrominated diphenyl ethers (PBDEs), which were widely used in furniture, electronics, and many other products before being banned in the 2000s. Organohalogen substances can now be found in the blood of virtually all humans [1].

Today, flame retardants are used in a very wide array of applications and products; for instance in furniture, vehicles of all kinds (from cars to aircrafts), in many plastics (including children's products like cribs and car seats), in home insulation materials, and in virtually all consumer electronics. Strong evidence has linked some widely used flame retardants to a number of health conditions, including lowered IQ and hyperactivity in children, cancer, hormone disruption, and decreased fertility [2] [3].

Several of the most important flame retardants (such as PBDE, decaBDE, and HBCDD) have now been banned worldwide under the international Stockholm Convention on Persistent Organic Pollutants. Unfortunately, this has resulted in their substitution with newer and less well studied flame retardants—including brominated, chlorinated and organophosphate substances such as tris(1,3-dichloro-2-propyl) phosphate (TDCPP), tris(2-chloroethyl)phosphate (TCEP), and triphenylphosphate (TPP), each of which are suspected of harmful effects on health [4] alternative flame retardants are increasingly being used to meet some flammability standards; however it is often unclear which chemicals are being used and how frequently. In an attempt to address this data gap, researchers in the US collected and analyzed 102 samples of polyurethane foam from residential couches purchased from 1985 to 2010. Overall, they detected chemical flame retardants in 85% of the couches analysed. In samples purchased prior to 2005 (n = 41). Worse yet, many newer flame retardants remain unidentified, their identities protected as trade secrets [5]. Few of these replacement flame retardants are currently regulated at the EU level.

1. H. Bjermo et al., "Serum levels of brominated flame retardants (BFRs: PBDE, HBCD) and influence of dietary factors in a population-based study on Swedish adults,"Chemosphere, vol. 167, pp. 485–491, Jan. 2017, doi: 10.1016/j.chemosphere.2016.10.008

2. "Flame retardants | HBM4EU - science and policy for a healthy future." https://www.hbm4eu.eu/the-substances/flameretardants/ (accessed Jun. 23, 2020).

3. "Flame Retardants," Green Science Policy Institute, Oct. 14, 2013. https://greensciencepolicy.org/topics/flameretardants/ (accessed Jun. 29, 2020).

4. H. M. Stapleton et al., "Novel and high volume use flame retardants in US couches reflective of the 2005 PentaBDE phase out," Environ. Sci. Technol., vol. 46, no. 24, pp. 13432–13439, Dec. 2012, doi: 10.1021/es303471d.

5. For example, the common flame retardant known as Firemaster 550 was a trade secret until its four components were identified by chemical analysis by Stapleton in 2008. This type of secrecy greatly hinders the ability of independent scientists to study the health effects of these chemicals.

FLAME RETARDANTS

POTENTIAL HEALTH IMPACTS:

Lowered IQ and hyperactivity in children, cancer, hormone disruption, and decreased fertility

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HEAL gratefully acknowledges the financial support of the European Union (EU), the Global Greengrants Fund, and the Kristian Gerhard Jebsen Foundation for the production of this publication. The responsibility for the content lies with the authors and the views expressed in this publication do not necessarily reflect the views of the EU institutions and funders. The funders are not responsible for any use that may be made of the information contained in this publication.