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## Flame retardants benefit challenged

Successive generations of persistent chemicals are a needless hazard, say experts



Printed circuit board.

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A declaration<sup>1</sup> signed by nearly 150 scientists from 22 countries, published today in *Environmental Health Perspectives*, draws attention to growing concerns over the safety and management of flame retardants and calls for safer alternatives, responsible handling, and more data on the toxicity of these chemicals.

Writing in an editorial<sup>2</sup> published alongside the statement, Linda Birnbaum and Åke Bergman note that flame retardants banned decades ago were replaced by chemicals with similar properties — only for these substitutes to be phased out as well once evidence of their toxicity began to emerge.

“The San Antonio Statement is a call for attention to a continuing pattern of ‘unfortunate substitution’,” write Birnbaum, director of the US National Institute of Environmental Health Sciences, the publisher of the journal, and Bergman, professor at Stockholm University in Sweden.

Presented at a **symposium** that took place in mid-September in the US city of San Antonio, Texas, the statement has also been approved by the International Panel on Chemical Pollution, an international network of chemical pollution scientists based in Zurich, Switzerland.

In addition to concern over the safety of successive generations of flame retardants, the signatories question whether use of these chemicals is needed in the first place. “Brominated and chlorinated flame retardants can increase fire toxicity, but their overall benefit in improving fire safety has not been proven.”

Evidence cited by the experts suggests that products containing some flame retardant chemicals can in fact raise the risk of deaths and injuries in a fire, by increasing exposure to carbon monoxide, toxic gases and soot. In some cases they may not even reduce the flammability of materials or the severity of a fire, according to the statement.

“More attention should be paid to the actual need for flame retardants in products,” write Birnbaum and Bergman. “For example, do nursing pillows and baby strollers need flame retardants?”

They say that alternatives should be developed — both alternative methods for preventing fires, such as limiting sources of ignition, and alternative chemicals that serve a similar function without compromising safety.

Brominated and chlorinated flame retardants have been used for decades in various products, from textiles to furniture foams and electronic equipment, including printed circuit boards. Their presence in electronics makes disposal of this equipment an additional concern, as **growing volumes of e-waste** are being burned in informal recycling operations, putting workers and people in the area at risk for health effects associated with exposure to flame retardants and dioxins.

Scientists began to study flame retardants in the early 1970s, when polybrominated biphenyls (PBBs) were added accidentally to cattle feed in the US state of Michigan. Following the ban on PBBs, the use of other flame retardants called polybrominated diphenyl ethers (PBDEs) increased sharply.

Some of those substitutes have also been banned or withdrawn in recent years. But the persistence of all chemicals in this group means that people may still be exposed to old and new flame retardants. Studies have detected them in the environment, for example in **dust** and **car interiors**, and in people, particularly those **exposed through e-waste recycling**.

Few of these chemicals have been regulated, and data on toxicity are lacking, according to the statement. But animal toxicity studies suggest that exposure could harm the liver, the thyroid, and neurodevelopment. **Recent epidemiological research** has linked prenatal exposure to flame retardants with impaired mental development in young children.

The signatories call for more information about the presence of these chemicals throughout the life cycle of consumer products. They also urge responsible transport and disposal, and advocate alternatives that have no hazardous properties.

“The process of identifying alternatives... should include not only alternative chemicals but also innovative changes in the design of products, industrial processes, and other practices that do not require the use of any flame retardant,” they write.

References and link

1. DiGangi J, Blum A, Bergman A, de Wit CA, Lucas D, Mortimer D, *et al.* San Antonio statement on brominated and chlorinated flame retardants. *Environ Health Perspect* 2010. doi: [10.1289/ehp.1003089](https://doi.org/10.1289/ehp.1003089)
2. Birnbaum LS, Bergman A. Brominated and chlorinated flame retardants: the San Antonio statement. *Environ Health Perspect* 2010. doi: [10.1289/ehp.1003088](https://doi.org/10.1289/ehp.1003088)

**US Environmental Protection Agency information** on PBDEs

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