

# New flame retardants, old problems

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New flame retardants escaping from our TVs, other electrical and electronic products, and children's car seats are just as toxic as the flame retardants they're intended to replace, according to a peer-reviewed study published today in *Environmental Science & Technology Letters*. The authors found that the replacement chemicals, called organophosphate flame retardants, have been associated with lower IQ in children, reproductive problems, and other serious health harms.

Flame retardants pose a particularly grave threat to children. Babies are born with the same level as their mothers and are further exposed through hand-to-mouth behavior. Young children can have 3 to 10 times the flame retardant levels of adults, or even more. This can harm their developing brains and reproductive organs at the most vulnerable time.

"We need to realize that these [flame retardants](#) threaten the brain development of a whole generation," said retired NIEHS Director Linda Birnbaum.

Flame [retardant](#) chemicals aren't necessary, or even effective, for reducing fire hazard in many products. These chemicals are added to meet flammability regulations. But research shows they often delay ignition only a few seconds, and make fires more dangerous.

After years of research and advocacy, dangerous flame retardants called polybrominated diphenyl ethers (PBDEs) were phased out of use in furniture foam, electronics, and children's products. While their phaseout was initially celebrated as a victory for [human health](#), PBDEs

have been swapped out with organophosphate flame retardants in many products.

Like the old PBDE flame retardants, organophosphate flame retardants are continuously migrating out of products and dropping into dust. When dust contaminated with flame retardants gets on your hands, you can end up eating the flame retardants along with your sandwich. The scientists also found that levels of organophosphate flame retardants are often 10 to 100 times higher in air, dust, and water than the previous flame retardants.

Most concerning of all, [organophosphate flame retardants](#) were found in nearly every person studied. Several were found at levels high enough to threaten fertility in adults and healthy brain development in children.

"These results show the danger of the whack-a-mole approach to chemical policy," said Dr. Marta Venier, an Associate Scientist at Indiana University. "When manufacturers have to stop using a toxic chemical, they often replace it with a similar chemical with similar harms. In the case of flame retardants, we're jumping out of the frying pan and into the fire."

For this study, the investigators reviewed nearly one hundred peer-reviewed scientific papers on flame retardants. They compared research findings on the health effects, environmental harms, and chemical properties of the older PBDEs and newer organophosphates.

They found that the replacement chemicals are carried by wind and water far from their origin—even to the ocean depths, icy mountain tops, and Earth's poles. "Organophosphates are now found worldwide, polluting areas where flame retardants were never used," according to Professor Miriam Diamond from the University of Toronto.

The authors call for manufacturers to increase fire safety in furniture, electronics, and children's products with creative designs and inherently fire-resistant materials. "Our findings demonstrate the importance of dealing with these chemicals as a class rather than individually," said Veena Singla at the University of California, San Francisco Program on Reproductive Health and the Environment. "While policies are heading in that direction, we can act now to reduce unnecessary use to protect human and environmental health."

"It's disheartening that after years of health harm to our children from PBDE flame retardants, the most widely used replacements appear to be just as bad," said Dr. Arlene Blum, Executive Director of the Green Science Policy Institute. "To protect future generations, manufacturers can and must stop the cycle of toxic substitutions and avoid unneeded [flame](#) retardants altogether."

**More information:** Arlene Blum et al. Organophosphate Ester Flame Retardants: Are They a Regrettable Substitution for Polybrominated Diphenyl Ethers?, *Environmental Science & Technology Letters* (2019). [DOI: 10.1021/acs.estlett.9b00582](https://doi.org/10.1021/acs.estlett.9b00582)

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