

Flame Retardant Exposure Linked to House Dust

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Common house dust may be an important source of a potentially dangerous class of chemicals called polybrominated diphenyl ethers (PBDEs), according to an exploratory study* by researchers at the National Institute of Standards and Technology (NIST) and the Environmental Protection Agency (EPA). Recent studies by others have found that PBDEs have been accumulating in human blood, fat tissue and breast milk.

PBDEs have been widely used in consumer products for years because they are effective flame retardants, greatly increasing the fire safety of products ranging from carpeting and cushions to televisions, computers and coffee makers. In recent years, however, concerns have grown with evidence that PBDE concentrations are increasing rapidly both in the environment and in human tissues and body fluids. Toxicological data on PBDEs is still limited, but the compounds have been implicated in developmental, reproductive, neurotoxicity and thyroid effects in rats, mice and fish, and may be carcinogenic. Researchers in Europe and the United States found concentrations of PBDEs higher in Americans than in Europeans, although it is not known if these levels affect human health.

Some studies have suggested that people accumulate PBDEs through diet (similar to polychlorinated biphenyls or PCBs), however, diet alone does not seem to explain the high levels of PBDEs that have been measured in human breast milk and serum. According to the new NIST/EPA study, house dust and the home environment are likely

candidates for other sources of exposure.

A survey of 17 homes in the Washington, D.C., and Charleston, S.C., areas found high concentrations of PBDEs in household dust, ranging from 700 to 30,100 nanograms per gram. Researchers analyzed both dust from floors and clothes dryer lint for 22 variants of commercial PBDEs and found PBDEs in every sample. Interestingly, there was little correlation between PBDE levels and the age of the dwelling or the number of foam cushions or appliances, but smaller dwellings tended towards higher concentrations of the PBDEs commonly used in high-impact polystyrene for TV and computer casings.

Although the new study is limited, say researchers, it highlights the need to study house dust as the primary source of PBDE exposure. In particular, the authors note that small children are more at risk than adults to dust exposures since they are more prone to putting dusty hands and toys in their mouths.

*H. Stapleton, N. Dodder, J. Offenber, M. Schantz, and S. Wise.
“Polybrominated Diphenyl Ethers in House Dust and Clothes Dryer Lint.” Environmental Science and Technology, published online Dec. 29, 2004.

Source: NIST

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