

Flame Retardant Contamination at Fire Scenes

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High levels of several flame retardant chemicals have recently been found in household dust. Some of the polybrominated diphenyl ether (PBDE) flame retardants used earlier have been phased out due to the fact that they have been found widely dispersed in the environment, they bioaccumulate in human tissue, and they exhibit toxicity. Replacement flame retardants, such as the mixture known as Firemaster 550, may have some of the same drawbacks. Flame retardants are generally not chemically bound to the plastics, foam rubber and electronic components that they protect, and are easily dispersed from the matrix.

Due to the widespread presence of banned as well as current flame retardants in house dust, there is concern that firefighters may be exposed to these chemicals at fire scenes. Because these compounds are so stable, they may be left intact when the matrix in which they were dispersed is burned. This would put firefighters at greater risk of exposure than the general public. During my previous research, large quantities of di-(2-ethylhexyl) phthalate (DEHP), a plastic additive, were found contaminating used firefighter gloves, hoods and jackets. Samples from these protective clothing items will be analyzed to determine whether they are also contaminated with flame retardants.

Flame retardant chemicals are lipophilic and are known to accumulate in fatty tissue. Due to the lipophilicity of the chemicals, if firefighter protective clothing is contaminated with them, the chemicals may be absorbed through the skin, especially at the high temperatures encountered during firefighting.

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