

Regional variation in levels of indoor polybrominated diphenyl ethers may reflect differences in fire safety regulations for consumer products

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Objective: Polybrominated diphenyl ethers (PBDEs) are widely used as additive flame retardants in plastics, electrical equipment, and insulation, and may be released in the indoor environment via volatilization or as dust particles. Yet, few studies have examined geographical variability in indoor PBDE levels using standardized methods.

Methods: Indoor air and dust samples were collected from homes in northern California (CA) (N=50) and Cape Cod, Massachusetts (Cape) (N=120) using similar sampling methods and analyzed for BDE-47, -99, and -100.

Results: Median dust concentrations ($\mu\text{g/g}$) in CA homes of BDE-47, -99, and -100 were 2.7, 3.8, and 0.73, respectively and were three to nine times higher than Cape homes. There was a 10-fold difference in maximum dust concentrations of BDE congeners between CA (31-170 $\mu\text{g/g}$) and Cape homes (3.4-22.5 $\mu\text{g/g}$). While none of the congeners were detected in the indoor air of Cape homes, BDE 47 was detected in 14% of air samples in CA homes (Range: 0.77-3.39 ng/m^3). Dust levels in CA homes were substantially higher than previously reported levels in United Kingdom; Germany; Ottawa, Canada; Cape Cod, MA; Boston, MA; and Washington D.C.

Conclusion: The observed regional differences in levels of indoor PBDEs may reflect the stringent fire safety standards for furniture in California.