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Disposition of BDE 47 in Developing Mice

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Despite its minor contribution to global polybrominated diphenyl ether (PBDE) production and usage, 2,2′,4,4′-tetrabromodiphenyl ether (BDE 47) is the dominant congener found in most biotic samples in North America. The majority of public health concern has focused on potential hazardous effects resulting from exposure of infants and young children to BDE 47 because of previous studies reporting adverse developmental effects in rodent studies, in combination with human exposure estimates suggesting that nursing infants and young children have the highest exposure to BDE 47. This study was designed with two objectives: (1) to investigate the disposition of BDE 47 in infantile mice reported to be susceptible to BDE 47 and (2) to investigate the disposition and excretion of BDE 47 at various developmental stages in an attempt to further identify the mechanism responsible for rapid urinary excretion. The disposition of ^{14}C-BDE 47 was monitored in C57BL/6 mice following a single oral dose of BDE 47 (1 mg/kg) at different stages of development. The results show that the toxicokinetics of BDE 47 are different in developing mice than in adult mice; whereas disposition patterns are similar, concentrations of BDE 47 are higher in pups because they have a reduced capacity to excrete BDE 47. These differences lead to higher concentrations of BDE 47 at target tissues during critical windows of development.

Key Words: BFR; PBDE; BDE 47; toxicokinetics.