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Food as a Main Route of Adult Exposure to PBDEs in Shenzhen, China

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Abstract

The present study measured eight PBDE congeners' (BDE-28, 47, 99, 100, 153, 154, 183, and 209) exposure via ingestion of indoor dust and soil, inhalation, and food consumption. Contributions to PBDEs exposure from different media revealed that indoor dust (dust suspended in air) was not an important exposure route for PBDE congeners for adults in Shenzhen, China. Food consumption contributed more to daily intake of Σ_8BDE, especially for lower-brominated PBDE congeners. Based on calculated average total daily intake, hazard quotients were determined to estimate the non-cancer risks of PBDE exposure. Meanwhile, cancer risk was also estimated assuming that the oral cancer slope factors of all PBDE congeners are equipotent as BDE-209. The hazard quotients ranged from 1.2×10^{-5} (BDE-209) to 2.0×10^{-2} (BDE-47), suggesting a low deleterious risk with regard to PBDEs. The cancer risk value ranged from 1.1×10^{-24} to 5.5×10^{-21} implying that the total risks due to exposure to PBDEs via all exposure routes are extremely low for adults.

Highlights

► Concentrations of PBDEs were similar in indoor dusts and soil. ► Food is the main route of adult exposure to PBDEs in Shenzhen, China. ► The total hazard quotient of PBDEs for adults living in new buildings is far less than 1. ► The total risks due to exposure to PBDEs in Shenzhen are extremely low for adults.

Keywords: Food; PBDEs; Human exposure; Adult; Cancer risk; Indoor dust