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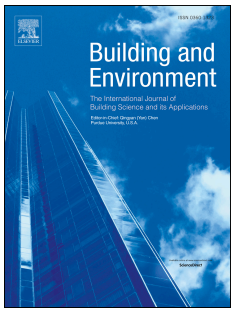

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Dermal Exposure to Phthalates in Home Environment: Handwipes, Influencing Factors and Implications

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ABSTRACT

Abundances of six commonly used phthalates (dimethyl phthalate (DMP), diethyl phthalate (DEP), di(isobutyl) phthalate (DiBP), di(n-butyl) phthalate (DnBP), butyl benzyl phthalate (BBzP) and di(2-ethylhexyl) phthalate (DEHP)) on hand surfaces were measured from 30 participants in Chongqing residences. Target phthalates were frequently detected (more than 70%) except for DMP and BBzP (roughly 30%). DEHP was detected in all samples and had the greatest abundance. DEHP levels in the palms were significantly higher for times since the last handwashing >2h. Living room gas-phase concentrations of DnBP and DEHP were significantly correlated with those in handwipes. DEHP did not appear to equilibrate between gas and hand skin surface lipids. The median dermal uptakes based on direct gas-phase absorption were 0.64, 0.35, 0.50μg/day/kg-bw for DiBP, DnBP and DEHP, respectively. The median dermal uptakes estimated from skin wipes were 0.18, 0.34 and 0.32μg/day/kg-bw, respectively, which were 2.0 to 6.8 times higher than the inhaled doses.

Keywords: Phthalates, Handwipes, Dermal exposure, Indoor environment

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