

CHARACTERIZING POTENTIAL EXPOSURE PATHWAYS BASED ON PROPERTIES OF RESIDENTIAL CONTAMINANTS

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Efficient approaches are required to characterize environmental exposures for human health studies. The goal of this work was to analyze data collected in a large-scale observational exposure study to develop metrics based on compound properties that can be used to identify important environmental factors and exposure pathways. In this analysis, we used data collected for the US EPA sponsored Children's Total Exposure to Persistent Pesticides and Other Persistent Organic Pollutants (CTEPP) study. In CTEPP, commonly used chemicals were measured in residential environments of over 250 preschool-age participants. Concentrations of over 40 pollutants were analyzed in samples of indoor air, house dust, and indoor surfaces. A previous analysis for phthalate esters was extended and air-surface adsorption isotherms developed for additional chemicals measured in CTEPP (including OP and pyrethroid pesticides) to evaluate the impact of chemical properties on distribution in the indoor environment. Despite complex multi-component interactions that may impact interpretation of concentration data collected in the residential environment, simple equilibrium-based approaches provide a reasonable basis for identifying important exposure pathways. Insight from this work can be used to improve characterization of environmental factors in human health studies of gene-environment interactions. *This work was reviewed by EPA and approved for publication but does not necessarily reflect official Agency policy.*