ECOS-TOX

Complex exposures to semi-volatile organic compounds in house: Derivation of cumulative toxicity reference values (TRVs)

Context and objective: Many semi-volatile organic compounds (SVOCs) are present in dwellings (air and settled dust) and are suspected to have reprotoxic, immunotoxic and neurotoxic properties. In addition, most of them are considered as endocrine disruptors and may have similar mechanisms of action. In order to carry out a cumulative risk assessment for children, the ECOS-TOX project aims at grouping SVOCs together according to their common effect and mechanism of action and deriving “multi-pollutants” toxicity reference values (TRVs) for each group of SVOCs

Methods: Based on several French measurement campaigns, SVOCs were selected according to their quantification frequency. A literature review was made in order to identify all mechanisms of action which could explain the effects of SVOCs observed in mammals and humans. SVOCs were classified in different groups characterized by a common cellular effect or a similar mechanism of action. For each group identified, point of departure indexes or relative potency factors will be derived according to the available scientific data and dose-response relationships.

First results: 21 pollutants where selected including phthalates, polybromodiphenylethers (PBDEs), polychlorobiphenyls (PCBs) and pesticides. Based on the effects on the reproductive, nervous and immune systems, 9 groups of SVOCs were constituted (example with the male reprotoxic effects: phthalates, some PBDEs, bisphenol A, lindane, and some pyrethrinoids could induce an inhibition of the testosterone synthesis in the Leydig cells).

Valorisation: Fournier K, Bonvallot N, Glorennec P. Cumulative exposures to indoor semi-volatile organic compounds: grouping chemicals for the derivation of “multi-pollutants” toxicity reference values. Communication for the INTERNATIONAL CONFERENCE “Recent advances on the environmental and health effects of endocrine disrupters”, PNRPE, Paris, 10-11 December 2012. France.

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