Environmental and Human Health Risk Assessment of Chemicals in Consumer Articles and Products

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Today the emission of chemicals has shifted from the traditional polluters (factories, energy plants, industries, mills, sewage treatment, transport) to a release from consumer products and hence from point sources to diffuse sources. Considering the sheer number of chemicals and the ever changing amounts that are used in the multitude of consumer products on the market, it is obvious that a detailed knowledge on the use of chemicals in the various consumer articles and products and their release during use, disposal and recycling is needed in order to evaluate potential risks.

The aim of the session on Environmental and Human Health Risk Assessment of Chemicals in Consumer Articles and Products was to collate and exchange information on conceptual, theoretical and experimental studies of chemicals in consumer articles and products, on their release and (eco)toxicity. The session comprised 6 platform presentations and 20 poster presentations dealing with various topics like human health risks from food contaminants (Pb in game meat, PCBs and PBDEs in fish oil supplements, PCBs, dioxins and dibenzofurans in fish from the Baltic, HBCDs in human milk), exposure models for food contaminants near industrial sites, and exposure to pesticide workers based on chemical analyses of blood samples.

Standardized bioassays have been used to estimate hazards and risks for products like detergents, hydraulic oils, tires and textiles. Bioassays are also useful for characterization of the hazards and assessment of risk associated with wastes like fly ash and contaminated soil. Variations in acute toxicity were 100 to1000-fold among different products, pointing to a huge potential for reductions of toxic emissions through product selection. For products like flame retardants, hydraulic oils and car tires, technical performance must also be considered, but for detergents and textiles variations in technical performance may be less obvious.

Investigations on toxicity and contaminants by the use of TIE (Toxicity Identification Evaluation) resulted in substantial reductions of industrial (e.g., pulp mill) wastewater emissions during the last two decades, and today most industrial wastewaters are not acutely toxic to aquatic organisms. Most of the reduction resulted from industrial process management steered by toxicological knowledge. The same or even greater potential exists for consumer products and articles, and intensified research on chemicals and their toxicity in consumer articles and products is the key to success.

One example of an unknown chemical in a consumer product was the detection of 1,2-DCA (dichloroethane) in holiday decorations, which resulted in indoor air contamination of concern. This suggests that not only water and soil but also air contamination must be considered when dealing with chemicals in consumer articles and products.

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