52 Target and nontarget screening of chemicals in the indoor environment for human exposure assessment

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People are spending more and more time indoors in well-insulated buildings, and are more heavily engaged with multiple electronic devices already at a young age. The indoor environment is known to be contaminated by compounds belonging to various classes, that are emitted from construction materials, interior decorations, kitchen utensils, food packaging, electronic equipment, carpets, textiles, flooring, furniture, etc. The indoor environment is rather complex as there are several sources of substances and some of the substances can even have multiple functions. Within the SHINE project (funded by CEFIC-LRI), aiming at target and nontarget screening of chemicals in the indoor environment for human exposure assessment, firstly, novel BFRs, HBCDDs, OPFRs, PFASs, CPs, plasticizers and pesticides were analyzed in dust and air samples from homes, offices and daycare centers in several European countries. In addition to this targeted analysis aimed at quantifying the levels of known contaminants, a database was compiled to support the suspect screening of these samples using high resolution mass spectrometry to identify chemicals of emerging concern. Information from the CPCat, KEMI, BUMA, NORMAN and ECHA databases was combined with reports from the literature on the occurrence of chemicals in consumer products, dust and air [1]. Suspect screening of a selection of dust and air samples is ongoing, while the concentrations of > 100 different compounds belonging to a wide variety of chemical classes form a rich data set for evaluation of e.g. trends and differences in use of certain compounds between countries, but also for human exposure modeling. The model of choice is the RAIDAR-ICE model (Risk Assessment, IDentification And Ranking - Indoor & Consumer Exposure), a model for risk-based screening and prioritization of human exposure to chemicals from near-field sources [2].1.   Lucattini, L., Poma, G., Covaci, A., De Boer, J., Lamoree, M., Leonards, P. 2018. A review of semi-volatile organic compounds (SVOCs) in the indoor environment: occurrence in consumer products, indoor air and dust. Chemosphere, 201, 466-482.2. Li, L., Westgate, J.N., Hughes, L., Zhang, X., Givehchi, B., Toose, L., Armitage, J.M., Wania, F., Egeghy, P., Arnot, J.A. 2018. A model for risk-based screening and prioritization of human exposure to chemicals from near-field sources. Environmental Science & Technology, 52, 14235-14244.