HEALTH RISKS ASSOCIATED WITH PAHs IN INDOOR DUST COLLECTED FROM HOUSEHOLDS IN VOJVODINA PROVINCE

Jelena Živančev, Igor Antić, Maja Buljovčić, Nataša Đurišić-Maldenović

University of Novi Sad, Faculty of Technology Novi Sad, Bulevar cara Lazara 1, 21000 Novi Sad, Serbia

natasadjm@tf.uns.ac.rs

ABSTRACT

Dust is increasingly attracting public attention, as a complex matrix that is used to assess human exposure to various contaminants, both in indoor and outdoor environments. Knowledge about the adverse effects caused by various pollutants on human health is crucial. Thus, the main aim of this research was to perform a preliminary survey of PAHs present in indoor dust samples (n=47) collected from households located in the northern Serbian province of Vojvodina. The PAHs occurrence and profiles of indoor dust was investigated, along with their potential sources and carcinogenic risk. Total concentrations of 16 EPA priority PAHs in the dust samples ranged from 140 to 8265 μg/kg. In all analyzed dust samples, 4-ring PAHs dominated, representing 40-53% of total PAHs, followed by 3-ring PAHs (29-40%). Vehicle emissions and wood combustion were the major sources of PAHs in the Serbian indoor microenvironments, based on diagnostic ratios, principal component analysis (PCA), and positive matrix factorization (PMF). The incremental lifetime cancer risks (ILCRs) of exposure to PAHs found in indoor dust was 3.88E-04 for children and 3.73E-04 for adults, exceeding the US EPA safe limit of 1.00E-6. The highest exposure of the Serbian population to PAHs present in indoor dust was through dermal contact and accidental ingestion. Total cancer risks estimated for 85% of the studied locations exceeded 1.00E-4, indicating that places, where the Serbian populations spend the most of their lifetime, contained PAHs in concentrations that can affect human health.

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