

عنوان مقاله:

Health risk assessment of heavy metal exposure from indoor dust: A case study of residential buildings in Isfahan, Iran

محل انتشار:

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نویسندگان:

Makkiyah Abdulhssein Hammood - Environmental Science and Engineering Department, College of Agriculture and Natural Resources, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

Atefeh Chamani - Corresponding author: Environmental Science and Engineering Department, Waste and Wastewater Research Center, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

Soheil Sobhanardakani - Department of the Environment, College of Basic Sciences, Hamedan Branch, Islamic Azad University, Hamedan, Iran

خلاصه مقاله:

Background: Heavy metals (HMs) are toxic pollutants whose concentrations in confined spaces might cause severe health impacts. This study aimed to determine the concentration and health risk of As, Cd, Co, Pb, Mn, Ni, and V in indoor household dust in Isfahan during ۲۰۲۲-۲۰۲۳. Methods: Ninety dust samples were collected from ۳۰ sampling homes. After preparation and acid digestion of the samples in the laboratory, the concentrations of the elements were determined using the ICP-OES method and analyzed statistically. Results: Except for Pb, the HMs' mean concentrations were significantly lower than the permissible limit ($P < 0.05$). The maximum daily exposure through ingestion, inhalation, and dermal contact for children and adults were ۶۶.۱ and ۷۹.۱ mg/kg/d, respectively, with Pb as the relevant element in both groups. Furthermore, the maximum lifetime daily exposure doses of $۸-۱۰ \times ۲۶.۱$ mg/kg/d belonged to Pb. The maximum non-carcinogenic and carcinogenic risk values through direct ingestion, inhalation, and dermal contact were $۴.۸۳ \times ۱-۱۰$ and $۱.۴۰ \times ۸-۱۰$ for children and $۵.۲۳ \times ۲-۱۰$ and $۷.۹۱ \times ۹-۱۰$ for adults, which were associated with Pb in both groups. Conclusion: The results showed that the HMs content in indoor household dust in Isfahan followed a decreasing trend of $Pb > Mn > Ni > V > As > Co > Cd$. Moreover, direct ingestion followed by dermal contact and inhalation were the most important exposure pathways to the HMs-contaminated dust for both children and adults.

کلمات کلیدی:

Health risk assessment, Heavy metals, Exposure, Dust

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