**ASSESSMENT OF THE HEAVY METAL CONCENTRATIONS FOR INDOOR AIR QUALITY IN ASSALUYEH CITY, IRAN**

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**ABSTRACT**

Assaluyeh city, in south Iran, is one of the most heavily industrialized areas in the world with several gas, petrochemical industries and the most important oil refineries in Iran. The employed and indigenous population is estimated at 60,000 habitats, more than half of whom are permanent residents. In this study we analyze the concentrations of heavy metals obtained indoors via 40 samples in spring and summer 2021 (20 samples of dust inside the buildings in each season). Dust samples were collected from vacuum cleaner bags on a regular basis, using volunteers living in governmental houses in the area. The content in the vacuum cleaner compartment was emptied in plastic bags, which were sealed, labeled and stored at below 5 °C until chemical analysis. For chemical preparation and digestion of samples, the following materials and tools have been used: (i) 63 micron mesh sieve, (ii) PTFE Teflon tubes for digestion of samples, (iii) nitric acid 65%, (iv) hydrofluoric acid 40% and, (v) perchloric acid 70% suprapure with very high purity, all of which provided by Merck, Germany. Inductively Coupled Plasma mass spectrometry (ICP-MS) was used to determine the concentration of heavy metals. Soil standards (CRM: NIST 2710) for elements were also used to measure the accuracy of the measurement method and the recovery percentage. The recovery for the studied elements was 79% to 115%. The chemical analysis revealed that in both seasons the concentrations of heavy metals were especially high, following the order of Fe >Cr >Ni >Pb >As > Cd. Furthermore, a significant difference was observed in the concentrations of toxic and carcinogenic elements like Cr, As and Ni since the mean summer levels were at 60.24±9.09 µg/g, 5.62±2.68 µg/g and 16.37±1.85 µg/g, while the respective concentrations were significantly lower in spring (17.55±9.66 µg/g, 2.98±1.66 µg/g and 13.54±2.37 µg/g for Cr, As and Ni, respectively). The analysis showed an increased health risk for the local population due to high concentrations of trace metals.

**KEYWORDS:** Trace metals, indoor air quality, oil refineries, health risk