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The Effect of Traffic on Harmful Metals and Metalloids in the Street Dust and Surface Soil from Urban Areas of Tehran, Iran: Levels, Distribution and Chemical Partitioning Based on Single and Sequential Extraction Procedures

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Abstract : Street dust and surface soil samples were collected from very heavy, heavy, medium and low traffic areas and natural site in Tehran, Iran. These samples were analyzed for some physical–chemical features, total and chemical speciation of selected metals and metalloids (Zn, Al, Sr, Pb, Cu, Cr, Cd, Co, Ni, and V) to study the effect of traffic on their mobility and accumulation in the environment. The pH, electrical conductivity (EC), carbonates and organic carbon (OC) values were similar in soil and dust samples from similar traffic areas. The traffic increases EC contents in dust/soil matrixes but has no effect on concentrations of metals and metalloids in soil samples. Rises in metal and metalloids levels with traffic were found in dust samples. Moreover, the traffic increases the percentage of acid soluble fraction and Fe and Mn oxides associated fractions of Pb and Zn. The mobilization of Cu, Zn, Pb, Cr in dust samples was easier than in soil. The speciation of metals and metalloids except Cd is mainly affected by physicochemical features in soil, although total metals and metalloids affected the speciation in dust samples (except chromium and nickel).

Keywords : street dust, surface soil, traffic, metals, metalloids, chemical speciation
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