

Heavy Metal Characterization of Road Dust and Possible Contribution to Ambient Air PM[#]

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Abstract: In this study, elemental concentrations in road dust samples were determined by x-ray fluorescence spectroscopy. Since road dust contribute to particulate matter (PM) concentrations in ambient air environment of cities, it is important to determine its elemental composition to consider possible health effects. Road dust samples were collected from two locations in the same neighbourhood, Goztepe district of Kadikoy Province in Istanbul, Turkey. The first sampling point was located on the Fahrettin Kerim Gokay Street with heavy traffic load and the second one on the Feneryolu Street with more modest traffic load. Samples were collected from March 2010 to May 2010. Results indicated that some traffic related heavy metals such as zinc, barium, and copper, likely to originate from mechanical abrasion of brake pads and tires of motor vehicles, had higher concentrations in the first sampling location indicating their correlation with the number of vehicles in traffic. In addition, the elements iron, chromium, cobalt, manganese, vanadium, and titanium, known to be associated with mechanical parts of motor vehicles and released as a result of mechanical friction, were also found more concentrated in the first sampling location with heavier traffic density. According to the Enrichment Factor (EF) results with respect to soil dust, some elements such as zinc, lead, and antimony have been enriched in road dust samples as a result of traffic activity. Some ambient air PM measurements performed earlier in the same area also indicated high EF values for these elements in PM samples. It can be concluded that at least some fraction of road dust is a clear source for PM in areas close to heavy traffic activity.

Keywords: *Road dust, heavy metal, PM, traffic*

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