

Horizontal Mobility of Heavy Metals from Dumpsite in North Central States, Nigeria

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Abstract

Industrialization and population growth has lead to the introduction of toxic substances into the environment as waste from manufacturing processes. This study describes the horizontal mobility of this waste containing heavy metals from dump sites to the surrounding environment of North Central state, Nigeria. Soil samples were collected within the dumpsites and the immediate surrounding soil at distance of 10m and 20m away to assess the migration and potential bioavailability of Cr, Fe, Mn, Pb, Zn, Cu and Al. Total concentration of the heavy metals and their fractionation were determined. The results indicate that heavy metals are more concentrated in the uppermost layer with significant migration down the slope, thereby posing a threat to groundwater quality. In the fractions, the concentrations of the metals follow this sequence: Mn>Fe>Cu>Zn>Cr>Al. The mobility factors of the heavy metals are significantly high indicating high potential mobility and bioavailable forms of these heavy metals. The high concentrations of the heavy metals particularly Cr, as observed in the study is as a result of anthropogenic activities on enrichment of natural soil with bioavailable heavy metals. Consequently, there is a need to be cautious in the way waste that is generated from heavy metals sources is added to natural soil.

Keywords: Dump site; Environment; Heavy metals; Soil; Waste

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