

GEOCHEMICAL ASSESSMENT OF GROUNDWATER IN A TYPICAL URBAN SETTLEMENT

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Abstract

Geochemical assessment of groundwater was carried out within the basement complex of Ibadan, south-western Nigeria, in order to establish the impact of urbanization on public health. Physical parameters were determined using insitu digital analytical instruments and samples that were collected were simultaneously analyzed. Geochemical analysis of groundwater samples in parts of south-western Ibadan have revealed a significant concentration of $K > Ca > Mg > Fe > Zn > Cu > Pb > As > Cd$ in an increasing order. Ca and K were above the WHO standard. High Ca appears to be associated with the calcium rich products found as waste in the area, while the elevated levels of K could be related to weathering products in the groundwater as well as the effect of anthropogenic activities. Inter-elemental, strong correlation between Cd – Zn ($r = 0.983$), As – Ca ($r = 0.797$) and Ca – Cd ($r = 0.747$), indicate that the metals are governed by geochemical factors derived from an anthropogenic source, while K and Fe show a weak and negative correlation with all the metals thus indicating a different source. Index of geo-accumulation (Igeo), has revealed little or no contamination of the environment by trace metals. Potentiometric map of groundwater showed that contamination influx is in the south-west direction. It is observed that Ca and K contamination in groundwater is mainly due to anthropogenic activities in the area. Public health effect/hazard of these metals could be anemia, kidney damage, brain damage, cancer etc.,

Keywords: Contamination, Geochemical factors, Heavy metal, Public health, Groundwater