

Geology and Chemical Characterization of Groundwater in Kafin-Koro and its Environs, North Central Nigeria

Waziri, S. H., Waziri, N.M., Idris-Nda, A . and Adeniji, M.A.
Geology Department, Federal University of Technology, Minna, Nigeria
Salwaz1969@gmail.com 07035983684

ABSTRACT

Physico-chemical characteristics of 15 water samples collected from groundwater within Kafin-Koro and environs, North central Nigeria were determined. Statistical techniques were applied to the groundwater samples to determine 27 hydro-geochemical parameters in order to establish the relationship among the measured parameters and their sources. From various statistical analysis the cations (Ca^{2+} , Mg^{2+} , Na^+ , K^+) and anions (Cl^- , HCO_3^- , CO_3^{2-} , SO_4^{2-} , F^- , NO_3^- , NO_2^- , PO_4^{3-}) fell within WHO recommended standard as well as heavy metals like (Zn, Mn, Cu) with exception of Iron, manganese which are found higher than the acceptable limits in some locations. The dominant water type is CaHCO_3 representing 86.67% as well as mixed CaNaHCO_3 water type that accounts for 13.33%. Groundwater in the study area is found to be suitable for drinking, livestock feeding and irrigation purposes as revealed by irrigation indices such as Sodium Absorption Ratio (SAR), % sodium (SSP), Magnesium ratio (Mr) and Permeability index (PI). Gibbs plot, stoichiometric ratio and Chloro-Alkaline Indices (CAI) show rock weathering, cation exchange and carbonate weathering as major geochemical processes responsible for the water chemistry in the study area.