

## Hydrogeochemical Characteristics of the Different Aquiferous Layers in Oban Basement Complex Area (SE Nigeria)

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**Abstract :** The shallow and deep aquiferous horizons of the fractured and weathered crystalline basement Oban Massif of south-eastern Nigeria were studied during the dry and wet seasons. The criteria were ascertaining hydrochemistry relative to seasonal and spatial variations across the study area. Results indicate that concentrations of major cations and anions exhibit the order of abundance; Ca>Na>Mg>K and HCO<sub>3</sub>>SO<sub>4</sub>>Cl respectively, with minor variations across sampling seasons. Major elements Ca, Mg, Na and K were higher for the shallow aquifers than the deep aquifers across seasons. The major anions Cl, SO<sub>4</sub>, HCO<sub>3</sub>, and NO<sub>3</sub> were higher for the deep aquifers compared to the shallow ones. Two water types were identified for both aquifer types: Ca-Mg-HCO<sub>3</sub> and Ca-Na-Cl-SO<sub>4</sub>. Most of the parameters considered were within the international limits for drinking, domestic and irrigation purposes. Assessment by use of sodium absorption ratio (SAR), percent sodium (%Na) and the wilcox diagram reveals that the waters are suitable for irrigation purposes.

**Keywords :** shallow aquifer, deep aquifer, seasonal variation, hydrochemistry, Oban massif, Nigeria

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