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Geochemical Analysis of Domestic Groundwater Sources in a Suburb of Ota, Southwestern Nigeria

T. Kayode Olusola, P. Aizebeokhai Azegbobor, O. Adewoyin Olusegun, S. Joel Emmanuel and Omeje Maxwell

Department of Physics, (Geophysics Unit), College of Science and Technology,
Covenant University, Ota, Ogun State, Nigeria;
olusola.kayode@covenantuniversity.edu.ng; solajesreign@yahoo.com

Abstract

Groundwater as one of the most valuable natural resources supports human health, economic development and ecological diversity. The activities of many constituents related to groundwater such as micro-organisms, gases, inorganic and organic materials can lead to contamination of well water, municipal drinking water sources and the environment. Therefore, geochemical analyses of domestic groundwater sources within Iju, Southwestern Nigeria have been conducted to determine the groundwater properties of water samples from available hand-dug wells and boreholes within the area. Fifteen (15) water samples sourced from wells and boreholes within the study area were analyzed for their major trace elements using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) in the laboratory and physiochemical characteristics such as pH, total dissolved solids and conductivity were calculated to determine the suitability of such water for agricultural and domestic consumption. The bulk analysis on the water samples revealed that majority of the trace elements when compared with the World Health Organization (WHO) drinking water standards and Acme Laboratory Canada Method Detection Limits (MDL) have values that agree with the recommended limit. These findings show that the present status of groundwater in Iju is good for domestic and agricultural purposes. However, the presence of trace elements such as Lead, Bromide, Copper, Potassium, Manganese, Rubidium and Silicon in fairly high quantities in the groundwater samples which may be as a result of treatment in the water or dissolved salts in the groundwater may constitute major health hazards if not quickly checked. In spite of groundwater studies done in Ota, important information on groundwater resources in Iju is still largely unavailable. Thus, groundwater management can be effectively planned based on these results for the study

Keywords: Boreholes, Geochemical Analysis, Groundwater Management, Hand-Dug Wells, Trace Elements