

Gamma Radioactivity Measurement in Commercially-Available Drinkable Water In Lagos, South Western Nigeria

¹Adekoya O. I., ²Muhammed O. H., ²Makinde A. S., ¹Irabor U.E., ²Akinwunmi S. E.,
²Oluwakemi O.M and ²Onyechi H.C.

1. Department of Physical Science, Yaba College of Technology, Nigeria
2. Department of Chemical Science, Yaba College of Technology, Nigeria

(Received May 20, 2020; Revised June 05, 2020; Accepted June 05, 2020)

Abstract

In this work, gamma spectroscopy measurements of twenty commercially- available drinkable sachet and bottled waters within Lagos metropolis was carried out to determine the activity concentration of K-40, Th-232 and U-238 radionuclides in them. Measurement was done using a well calibrated NaI (TI) and well shielded detector coupled to a computer resident quantum MCA2100R Multichannel analyzer. The mean activities ($Bq\text{m}^{-3}$) in the sachet water samples ranged between 80.13 ± 20.01 to 101.12 ± 40.12 , 10.13 ± 4.20 to 12.21 ± 2.40 and 9.10 ± 1.12 to 10.42 ± 2.13 respectively for K-40, U-238 and Th-232. In the bottled water, the range of the activity ($Bq\text{m}^{-3}$) for K-40, U-238 and Th-232 was between 70.48 ± 39.28 to 100.09 ± 60.16 , 9.19 ± 3.01 to 12.80 ± 2.37 and 8.18 ± 3.34 to 10.93 ± 5.43 respectively. The computed mean annual doses (μSv) for the radionuclides investigated in the sachet water and bottled water was 0.972 and 0.974 respectively. All the samples had activity concentrations that were below the WHO guideline levels for the investigated radionuclides. Their annual ingestion doses were very well below the recommended limit of 0.1mSv thus posing no immediate health threats when they are consumed.