Measurement of Natural Radioactivity, Cations, and Heavy Metals in Euphrates River at Elanbar Governorate, Iraq

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Radiochemistry

Aims and scope

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Abstract

The natural radioactivity of ^{238}U, ^{232}Th, and ^{40}K was measured in selected samples from 11 monitoring stations along the Euphrates River in Elanbar governorate in 2022, using a NaI (Tl) gamma-ray spectroscopy detector 3” in diameter. The results showed that the average activity concentrations of ^{238}U (^{214}Bi), ^{232}Th (^{208}Tl), and ^{40}K in the water samples were 4.29, 1.62, and 10.95 Bq/L, respectively. Cations and heavy metals were measured using flame and flame atomic absorption spectroscopy (FAAS). The concentrations of Pb^{2+}, Na^{+}, and K^{+} were 0.02, 207, and 22 mg/L, respectively. According to the information provided by the World Health Organization, the samples studied in this work revealed the correlation between the heavy metals and cations. On the whole, waters of Elanbar governorate are unsafe in terms of the concentration of natural radioactive and heavy metals.

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Ethics declarations

The authors declare that they have no conflicts of interest.

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