

NATURAL RADIOACTIVITY IN SURFACE WATER FROM GALATI, ROMANIA

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Abstract: There are in nature three natural decay series: uranium-238, thorium-238 and uranium-235. The decay products from these series are present in air, Earth's crust, water. The gross alpha activities, gross beta activities and the activity concentrations of ^{nat}U , ^{nat}Th , ^{210}Po , ^{210}Pb , ^{226}Ra in surface water were determined. The analysed samples were collected from Danube River, Prut River, and Siret River in Galati County which is situated in Eastern part of Romania, an important zone in Lower Danube Euroregion and Black Sea basin. The gross alpha activity and the gross beta activity were determined using a MPC-2000-DP instrument, The concentrations of ^{nat}U and ^{nat}Th were determined by separation and purification on Dowex-resin followed by the spectrophotometric measurements of arsenazo III- U^{4+} complex and arsenazo III- Th^{4+} complex, respectively. The concentration of ^{210}Po and ^{210}Pb was determined by the measurement of the gross alpha activity after self deposition onto nickel disc. The concentration of ^{226}Ra was determined using a SARAD RTM 1688-2 instrument. The gross alpha activities, the gross beta activities and the activity concentrations of ^{nat}U , ^{nat}Th , ^{210}Po , ^{210}Pb , ^{226}Ra ranged from 12 to 174 mBq L⁻¹, from 25 to 65 mBq L⁻¹, from 8 to 14 mBq L⁻¹, from 3 to 14 mBq L⁻¹, from 0.7 to 0.8 mBq L⁻¹, from 30 to 77 mBq L⁻¹, from 0.100 to 0.166 Bq L⁻¹, respectively. These values are lower even than the maximum admissible concentrations in drinking water. The results obtained in this study can be used to assess possible future change of radiation concentration activity in surface water from this area.

Keywords: surface water, gross alpha and gross beta activities, activity concentrations of ^{nat}U , ^{nat}Th , ^{210}Po , ^{210}Pb , ^{226}Ra .

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