RadChem 2014



Contribution ID: 77

Type: Invited

Radioactivity in mineral waters from Iberian Peninsula

Thursday, 15 May 2014 15:30 (30 minutes)

Bottled mineral and spring waters in a total of 38 commercial brands from Portugal and Spain, all available from shelf in supermarkets, were analyzed for natural occurring radionuclides such as uranium and thorium isotopes, radium (226Ra), 210Pb, 210Po and tritium (3H). Radionuclide concentrations vary widely depending on the geological formation of the water source and the chemical characteristics of water. Uranium (238U) activity concentrations ranged from 0.2 to 297 mBq/L, 226Ra varied from 0.5 to 949 mBq/L, radioactive lead (210Pb) from 1.7 to 78 mBq/L and 210Po from 1.2 to 75 mBq/L. Radionuclide activity concentrations particularly those of uranium, thorium, and radium are assessed in conjunction with dissolved salts and major ions present in water. Isotopic ratios of uranium are analyzed and discussed in relationship with characteristics of water sources. Radioactivity intake through consumption of these waters was assessed and concluded that daily consumption of some of these waters may give rise to internal radiation doses above the recommended dose limit of 0.1 mSv/y for water consumption. Results are compared with data on other bottled waters in the European Union market , and discussed in the perspective of radiation protection of members of the public and current EU Directives.

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Session Classification: Radionuclides in the Environment, Radioecology 3

Track Classification: Radionuclides in the Environment, Radioecology