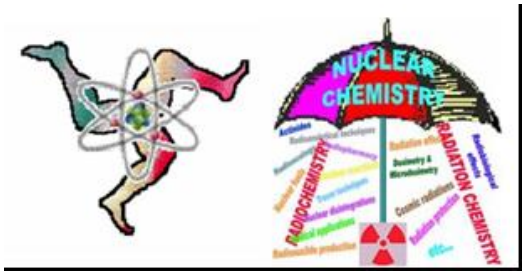

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Uranium in ground water samples of Northern Greece

Monday 19 September 2011 17:30 (1h 30m)

The activity concentrations of 238U and 234U have been determined in groundwater samples of hot springs and deep wells in Northern Greece. The analysis was performed by alpha spectroscopy after pre-concentration and separation of uranium by cation exchange (Chelex 100 resin) and finally its electro-deposition on stainless steel discs. The uranium concentration in deep wells and springs varies strongly between 0.15 and 7.66 μg l-1 and the corresponding 238U and 234U activity concentrations between 1.82-95.3 mBq l-1 and 1.70-160.1 mBq l-1 respectively. The obtained isotopic ratio 234U/238U varies between 0.95 and 1.74 indicating a disturbed radioactive equilibrium between the two uranium isotopes. In the studied waters uranium concentrations in solution decrease with increasing pH in the pH range between 7 and 9. This is attributed to the fact that at lower pH dissolution of soil minerals occurs and uranium which is adsorbed or forms solid solution with the geological matrix enters the aqueous phase. The strong dependence of the uranium concentration in the studied waters from the dissolution of the geological matrix is corroborated by the strong correlation of the uranium concentration with the electrical conductivity measured in the ground waters under investigation.

Author: Prof. IOANNIDOU, ALEXANDRA (ARISTOTLE UNIVERSITY OF THESSALONIKI, Physics Department, Nuclear Phys. & Elementary Particle Phys. Division)

Co-authors: Prof. PASHALIDIS, IOANNIS (Department of Chemistry, University of Cyprus, CY-1678 Nicosia, Cyprus); Mr SAMAROPOULOS, IOANNIS (ARISTOTLE UNIVERSITY OF THESSALONIKI, Physics Department, Nuclear Phys. & Elementary Particle Phys. Division); Mrs EFSTATHIOU, MARIA (Department of Chemistry, University of Cyprus, CY-1678 Nicosia, Cyprus); Prof. ZORAS, STAMATIS (Department of Environmental Engineers, Polytechnic School of Xanthi, Demokrition University of Thrace,)

Presenter: Prof. IOANNIDOU, ALEXANDRA (ARISTOTLE UNIVERSITY OF THESSALONIKI, Physics Department, Nuclear Phys. & Elementary Particle Phys. Division)

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