

Radiochemical methods analysis of U, Th and Ra: metrological and geochemical applications.

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A present conference describes the methods for determination of uranium, thorium and radium isotopes in natural samples. The first study was carried out by using alpha spectrometry. The thin alpha sources were prepared by chemical electrodeposition of U and Th and by sorption of Ra on MnO₂ coated polyamide discs. In the case of U and Th analysis, both elements were separated by using the ion-exchanges chromatography before their deposition. An other method was carried out by using alkaline fusion by LiB₄O₇ and LiBO₂, of U and Th determination in phosphate and in its derivatives is described.

The proposed methods have been applied for U, Th and Ra isotopes determination in the sedimentary rock: phosphate and black shale and coastal of Palaeozoic and Mesozoic sedimentary rocks, in natural water and in marine samples.

The second method was concerning the spectrometric determination of U and Th total concentration with Arsenazo III in conjunction with solvent extraction. It's consists of extractive separation of interfering Zr (IV) with HTTA/ Xylene followed by an extractive separation of U (VI) with TBP/ CCl₄ and the influence of interfering Fe³⁺ was eliminated by reduction of this ion with ascorbic acid. The nature of the extracted species is Zr Cl (TTA)₃, UO₂ Cl₂ (TBP)₂ and UO₂Cl₂ (TBP)₃ for Zr (IV) and U (VI), respectively. The developed method has been applied for the uranium and thorium determination in phosphates rocks.