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Americium and samarium determination in aqueous solutions after separation by cation-exchange

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ABSTRACT

The concentration of trivalent americium and samarium in aqueous samples has been determined by means of alpha-radiometry and UV-Vis photometry, respectively, after chemical separation and pre-concentration of the elements by cation-exchange using Chelex-100 resin. Method calibration was performed using americium (Am-241) and samarium standard solutions and resulted in a high chemical recovery for cation-exchange. Regarding, the effect of physicochemical parameters (e.g. pH, salinity, competitive cations and colloidal species) on the separation recovery of the trivalent elements from aqueous solutions by cation-exchange has also been investigated. The investigation was performed to evaluate the applicability of cation-exchange as separation and pre-concentration method prior to the quantitative analysis of trivalent f-elements in water samples, and has shown that the method could be successfully applied to waters with relatively low dissolved solid content.

Keywords: trivalent f-elements; determination; cation-exchange; composition; chemical recovery

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