

STUDY OF THE INTERFERENCES IN THE DETERMINATION OF Pu, Am AND Cm IN RADIOACTIVE WASTE BY EXTRACTION CHROMATOGRAPHY

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Increased public attention to radioactive waste disposal and the potential public health effects of releases of radioactive materials to the environment has made necessary to develop accurate and reliable methods for the determination of actinides in the low and medium radioactive wastes that arise from nuclear power plants.

Numerous methods have been described for effecting this separation, among them procedures based on ion exchange, liquid-liquid extraction, precipitation and combination thereof. Most of them involve separate rather than simultaneous determinations of these elements. These methods have always been time consuming and involved the use of large amounts of hazardous material.

Therefore, considerable effort has been made to adapt the selective liquid-liquid extraction methods to produce new chromatographic materials. This paper describes experimental studies carry out to determine ²³⁸Pu, ^{239/40}Pu, ²⁴¹Pu, ²⁴¹Am, ²⁴²Cm and ²⁴⁴Cm in samples from nuclear power plants (mainly spent ion exchange resins and evaporator concentrates) using an organophosphorus compound (octyl(phenyl)-N,N-diisobutylcarbamoylmethylphosphine oxide, abbreviated CMPO, in tri-n-butylphosphate (TBP)) immobilized on an inert polymeric support. These materials are commercially available under the name TRU-Spec (for Transuranium Specific) from Eichrom Industries.

An spent ion exchange resin sample was analyzed and its results compared with the obtained in the same sample using anion exchange chromatography.