

Suitability of Available Chromatographic Extraction Disks Towards Measurement of Tc-99 in Savannah River Site High Activity Waste.

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Waste cleanup efforts underway at the Savannah River Site created a need to characterize Tc-99 in the various high-activity-waste matrices that currently exist in Site inventories. The traditional method our laboratory used for analyzing Tc-99 in higher activity matrices was a solvent-solvent extraction method using Aliquat 336 in xylene. All Tc-99 extractions carried out in the laboratory are traced with Tc-99m generated using the facility's Cf-252 neutron activation analysis capability.

Alternative separation methodologies, to preclude the generation of listed wastes which occur using the Aliquat 336/xylene process, were desired. Some significant challenges for a replacement separation method were introduced due to the Site's wide variety of waste matrices and radionuclide distributions. To facilitate nuclear counting, the method had to be suitable both for liquid scintillation beta spectrometry for Tc-99 measurements, and for gamma spectroscopy determinations of Tc-99m tracer recoveries.

A number of environmental Tc-99 extraction methods have been investigated as possible substitutes for the older method. Eichrom TEVA solid phase extractions using their column technology have been employed in a case by case basis over the last several years. More recently, applications using Eichrom TEVA extraction disks and Empore Tc extraction disks have also been explored. Results of the various analyses and the methodology used will be discussed.