

## **Determination of Plutonium-240/239 Ratios in Low Activity Samples Using High Resolution Alpha Spectrometry**

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Isotopic ratios of  $^{240}\text{Pu}/^{239}\text{Pu}$  in environmental samples can provide important data for identifying and confirming contamination sources. One low cost alternative for performing this analysis uses a combination of high-resolution alpha-spectroscopy and spectrum analysis software. This method uses unmodified, commercially available equipment and software. Plutonium alpha-spectra were gathered with an alpha-spectrometer system set up for low-level actinide determination. Experimental spectra were imported into a commercially available data analysis program, and fit with mathematical descriptions of alpha-peaks using the Marquardt-Levenberg algorithm. The spectra was then deconvoluted into its  $^{239}\text{Pu}$  and  $^{240}\text{Pu}$  components and the activity ratio was calculated.

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