

Resolve™ Filters

for alpha spectrometry
source preparation



25mm dia.,
0.1 μ polypropylene filter

First filter with quality control for alpha spec

- FWHM < 50 keV ($^{241/243}\text{Am}$) per Eichrom Quality Control Test Protocol
- Pore size consistency verified by scanning electron microscopy (SEM)

Order as Part Number RF-100-25PP01

The Eichrom Difference:

Numerous radiochemistry laboratories have reported resolution quality concerns believed to be related to variability of the source prep filter. Maximum peak resolution in alpha spectroscopy requires as uniform a filter surface as possible to ensure a uniform deposition of the rare earth fluoride precipitate. Traditional filter manufacturer specifications pertain to removal of particles to result in defined solution purity characteristics. For example, a 0.1 μ rated pore size filter is typically defined as capable of removing 99.98% of particles $\geq 0.1\mu$ from a liquid. The pores present on the surface, however, may be much larger or smaller than 0.1 μ . Eichrom's Resolve Filters are tested to quality control specifications appropriate for alpha source preparation. These include a qualitative check for pore size uniformity and a limit on the maximum FWHM of Am-241 and 243 spectra.

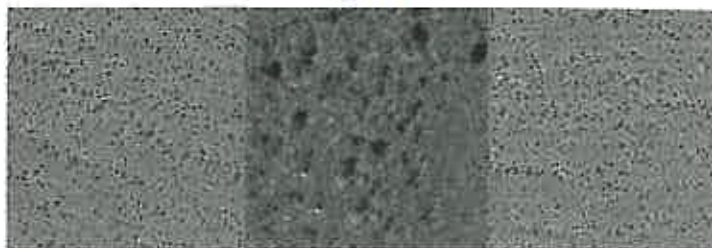
Scanning Electron Microscopy (SEM)

Figure 1 is an SEM photograph of a typical lot of Resolve™ Filters at 5000x magnification. Figures 2 and 3 show photographs of another supplier's product at the same magnification. One was reported to have poor alpha peak resolution performance (figure 2); the other reported to have excellent performance (figure 3). The poorly performing lot shows a number of very large pores (>1µ), while the well performing lot shows a much more uniform pore size distribution. Eichrom's Resolve filters exhibit this more uniform pore size across all product lots.

Figure 1

Figure 2

Figure 3



Typical Resolve™ Filter

Poor Performing Lot

Well Performing Lot

^{241/243} Am Resolution on Resolve Filter

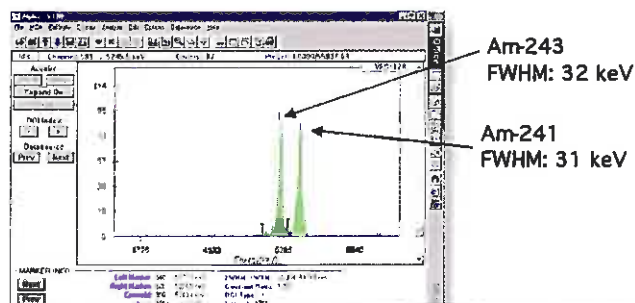
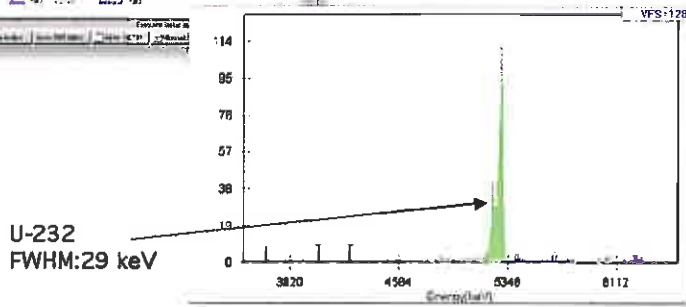


Figure 5

Performance in Alpha Spectroscopy

Membranes used in Resolve Filters are selected based on pore size homogeneity to result in sharp alpha spectra. We have evaluated the performance of multiple lots of filters in source preps of ²³²U and ^{241/243}Am. Figures 4 and 5 show alpha spectra for ²³²U and ^{241/243}Am on a typical lot of Resolve™ Filters.

Figure 4



²³² U Resolution on Resolve Filter

Quality Control

Incoming filter material is monitored and screened using scanning electron microscopy (SEM) to ensure necessary homogeneity of surface pore size distribution in our finished product. Additionally, a test measuring resolution of ²⁴¹Am and ²⁴³Am is performed on each filter lot manufactured. Specifications on this test are set at FWHM ≤50 keV for each peak.

The pore size distribution of Resolve Filters and their performance in alpha spectroscopy are monitored in Eichrom's QA/QC program. While the actual peak resolution that is observed is a function of many factors, Eichrom's QC program ensures that the filter itself will not contribute to poor resolution in alpha spectrometry. Resolve Filters are available in packages of 100, part number RF-100-25PP01.



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