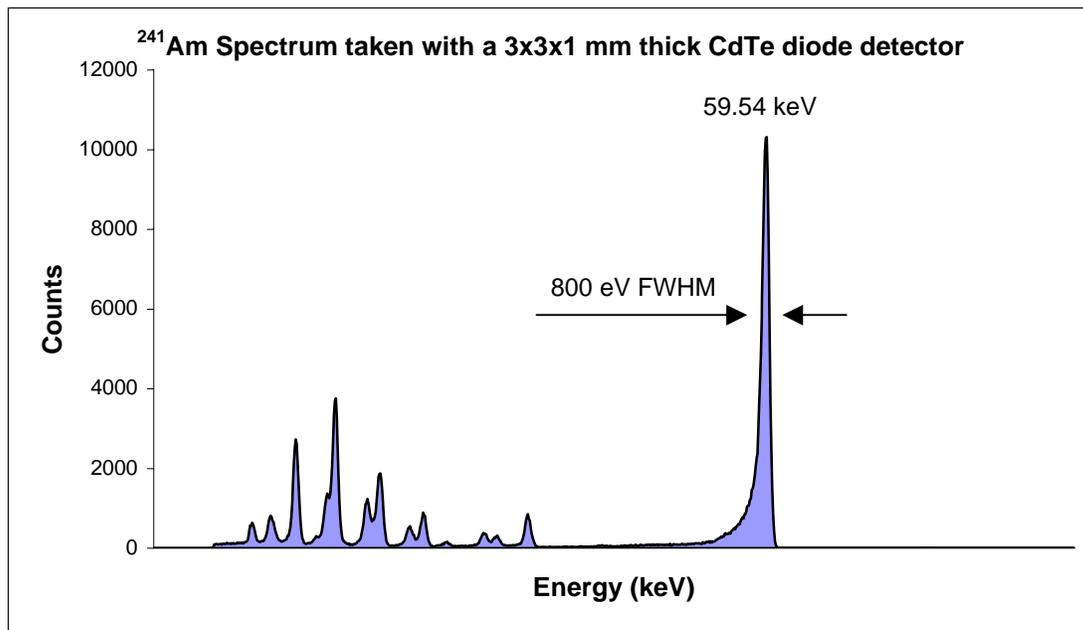


The use of CdTe-diode detectors vs. CZT

Recently developed CdTe Schottky diode detectors¹ with 1 mm thickness have shown an advantage over 2 mm thick CZT detectors. The use of Schottky contacts in CdTe detectors reduces the leakage current far below that of CZT. This permits the use of a much higher bias voltage than in a standard detector. Since the charge transport properties of the CdTe detector are much higher than CZT, the net result is a vast improvement in the usable depth (sensitivity). Additionally, because hole tailing and electronic noise are reduced, not only is the sensitivity improved but resolution is much better.

The use of the Rise Time Discriminator (RTD) in the main amplifier has the effect of eliminating pulses that originate from events near the back contact of the detector. In CZT, sometimes more than 50% of the actual thickness of the detector is, in effect, eliminated through the use of RTD in order to obtain a spectrum with good resolution. The new CdTe diode detectors can produce high resolution spectra without the use of RTD.



The ²⁴¹Am spectrum above was taken with a 3x3x1 mm thick CdTe-diode detector without the use of RTD. A resolution of 800 eV FWHM was obtained at the 59.54 keV peak.

Amptek reserves the right to substitute a 1 mm thick CdTe diode detector in place of a 2 mm thick CZT in order to obtain the best performance.

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¹ T. Takahashi and S. Watanabe, "Recent Progress in CdTe and CdZnTe detectors," IEEE Trans. Nucl. Sci. Vol. 48, NO. 4, pp. 950-959, Aug. 2001.