

SMALL, COMPACT AND COST EFFECTIVE. THE GR1 STRIKES AGAIN!

Replacing an expensive Germanium-based Detector with a Kromek GR1 room temperature CZT-based Gamma Spectrometer

Summary

This customer assessed the capability of a HPGe detector alongside Kromek's smaller, cheaper and easier to use CZT-based GR1 detector in taking the radionuclide purity measurements of PET radiopharmaceuticals. The results generated by the GR1 were comparable to those of the HPGe, leading the customer to conclude that the GR1 is a more than appropriate tool for quality control applications in Radiopharmacy.

An innovative Gamma Ray Spectrometry system using a compact and portable CZT Detector for Radionuclide purity tests of PET Radiopharmaceuticals

What's the problem with high-purity Germanium Detectors?

High-purity Germanium (HPGe) based detectors have been used to identify the Gamma Isotopes in a Radiopharmaceutical sample for many years.

But Germanium-based Gamma Spectrometers have their drawbacks, they:

- are very expensive;
- require cooling to cryogenic temperature;
- need highly accurate supporting electronics;
- need specialist training to operate;
- are large and can be difficult to use;
- are easy to damage.

These Kromek customers wanted to see if a [Kromek GR1 CZT-based Gamma Spectrometer](#) using Kromek's MultiSpect Analysis Gamma Spectroscopy software could replace a Germanium Detector.

SMALL, COMPACT AND COST EFFECTIVE. THE GR1 STRIKES AGAIN!

Abstract

This work was aimed at characterizing and validating a very compact, USB-powered, CZT (CdZnTe) detector for Gamma Ray Spectrometry applications in Radiopharmacy. A Kromek GR1 model was utilized. The detector was calibrated in energy and efficiency.

Samples of [18F]FDG and [68Ga]-DOTANOC were measured to assess the detector's suitability in radionuclidic purity measurements. The energy resolution and the efficiency obtained are fully adequate for quality control of positron emission tomography radiopharmaceuticals. Results of [18F]FDG and [68Ga]-DOTANOC samples proved to be comparable to those obtained using high-purity Germanium detectors.

The performance of the detector, the very compact size, ease of use, essentially zero maintenance and low power requirements makes the GR1 an extremely attractive tool for QC applications in Radiopharmacy.

The GR1 is a viable replacement for expensive Germanium-based Detector

