

New Vortex[®] SDD development for Low Energy X-Ray Detection

V. D. Saveliev, L. Feng, C. R. Tull, S. Barkan, M. Takahashi and E. V. Damron

SII NanoTechnology USA, Inc.
19865 Nordhoff St., Northridge, CA 91324
818-280-0745

We have developed several different x-ray spectrometers designs (the Vortex[®], Vortex-EX[®], Vortex-EM[®] and Vortex-ME4[™]) that are successfully used in a variety of industrial and scientific applications. Some of these applications include x-ray microanalysis, x-ray diffraction (XRD), x-ray fluorescence (XRF), total reflection XRF (TXRF), XRF imaging and x-ray absorption spectroscopy (XAS). These spectrometers are based on the Vortex[®] Silicon Drift Detector with a large active area of 45 mm² that operates with thermoelectric cooling and achieves excellent energy resolution (<130 eV FWHM at 5.9 keV and at optimum peaking time) and is capable to operate at very high counting rates.

One of the most important characteristics of the SDD for many XRF applications is the low energy x-rays performance. We will present results of our continuous efforts to improve the detection of low energy x-rays with the Vortex[®] SDD. We have improved the technique for producing of the radiation entrance window and developed new circular SDD with the active area of 50 mm² that demonstrates capability to detect x-rays down to berillium.

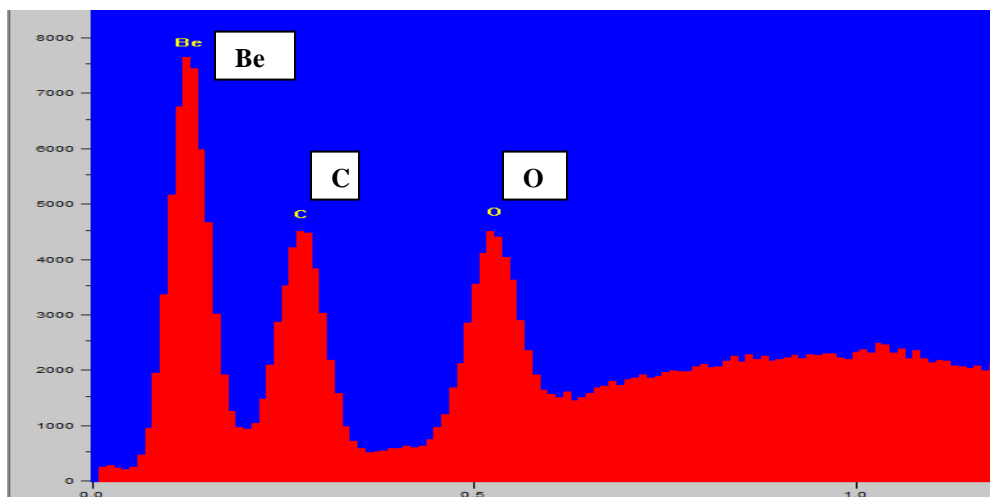


Figure 1. Spectrum from a beryllium sample in the electron microscope.