

Field Emission Scanning Electron Microscopy (FE-SEM) and Energy Dispersive X-Ray (EDX) Spectroscopy

The materials characterization facility is equipped with a Hitachi S-4700 Field Emission Scanning Electron Microscope (FE-SEM) as shown in Figure 1. The FE-SEM combines the versatility of PC control with a novel electron optical column to give exceptional performance. Resolution of 1.5 nm at 15 kV is guaranteed at 12 mm working distance. The FE-SEM also offers excellent low kV performance with resolution of 2.5 nm at 2 kV, at a working distance of 3 mm. Pre-programmed operating modes allow the user to switch from high resolution conditions to microanalysis conditions at the click of the mouse with no change of objective aperture. Dual SE detectors allow versatile imaging. The FE-SEM is equipped with fully digital imaging, image processing, and archiving system.



Figure 1: The Hitachi S-4700 Field Emission Scanning Electron Microscope (FE-SEM).

The FE-SEM is equipped with EDAX Energy Dispersive X-Ray (EDX) spectroscopy system with 30° take-off angle for quantitative analysis, digital imaging, and X-ray mapping. The EDAX SAPPHIRE SEM detector has a 20,000 : 1 peak-to-background ratio, and 128 eV resolution maintained at high throughputs. EDAX Phoenix microanalysis system contains the EDAM III data acquisition module, which allows for flexibility and enhanced performance through Digital Signal Processing for spectral and image acquisition and data reduction.