Scanning electron microscopy (SEM)

Scanning electron microscopy (SEM) uses electrons to obtain high magnification images. Two detectors are used to obtain images. The SE detector shows a topographical image, whilst the BSE detector shows variations in atomic number, and thus produces an image that varies with composition. The SEM is used in conjunction with energy dispersive x-ray spectroscopy (EDS), which uses x-rays produced from the sample during imaging to determine elemental composition. EDS analysis is used to give semi-quantitative information regarding the elements present at a particular point or area in the sample. It cannot give information regarding the structure, however when combined with the results from XRD, a good indication of the composition can be achieved.

The SEM (EDS) sample is examined in the SEM. AMEC carry out EDS analyses at a minimum of three points on the sample, in addition to an area analysis of the general structure. SEM (EDS) results are provided in the form of a table of the elements detected, with semi-quantitative compositional results, in addition to the spectrum for each analysis and any supporting images.