

USE OF THE SCANNING ELECTRON MICROSCOPE

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OBJECT

To observe the different imaging modes available on a SEM and to obtain compositional information using x-ray fluorescence. Your write up should be brief and explain the imaging modes and x-ray spectra obtained. You should take along one or more of your own specimens for study.

EXPERIMENTAL*Imaging*

From a fractured specimen:

1. Examine the fracture surface under an optical microscope.
2. Examine the fracture surface in the SEM - at different magnifications (including the ones you used in 1).
3. Obtain a pair of stereo micrographs of the fracture surface.
4. Obtain several x-ray spectra, using the Energy Dispersive Spectrometer, from various areas on the fracture surface.

For a flat polished two-phase sample:

5. Obtain and record a secondary electron image.
6. Obtain and record back-scattered electron images in both the compositional and topographic image modes.
7. Obtain selected area channeling patterns (SACP) in both secondary electron and back-scattered modes.
8. Obtain an electron back-scattered pattern (EBSP). Compare the patterns obtained in 7 and 8.

X-ray Spectra

8. Obtain x-ray spectra from the two phases in the specimen using the Energy Dispersive Spectrometer.
9. Obtain x-ray maps of the specimen using the prominent peaks obtained in 8.
10. Perform a x-ray line scan.

N.B. Although the lab will be performed in groups, write -ups should be **individual** efforts.