Rm. 23 SEM Study Guide 1/01

Required reading:

1. Scanning Electron Microscopy, A Student's Handbook, Michael T. Postek.

   Chapter 2.
   Chapter 3, pages 47-58.

2. Scanning Electron Microscopy and X-Ray Microanalysis, J. I. Goldstein

   Chapter 10, pages 461-482

3. SEM Cautions

4. Quick Start-Up and Shut-Down Guides

5. Rm. 23 SEM Operation Guide

   It is certainly not necessary to memorize the Operation Guide, but do understand the principles and procedures behind vacuum system operation, filament saturation, and lens clearance for samples.

Goals

- Understand general operation of the instrument and image formation.
- Understand practical aspects of filament saturation, vacuum system operation, and lens clearance for samples.
- Understand the trade-offs between resolution, depth of field, signal-to-noise ratio, working distance, probe current (probe size), and final aperture size.
- Understand basic electron-beam-sample interactions and limitations on resolution due to electron penetration and scattering.
- Understand the causes of charging and the most common solutions - selection of electron energy, providing a conductive path to the stage, and coating the sample.

Supplemental reading: Scanning Electron Microscopy, A Students Handbook, M. T. Postek

Chapter 4, for x-ray analysis.

Scanning Electron Microscopy and X-Ray Microanalysis, J. I. Goldstein

A more in-depth treatment of most subjects.