

AMRAY 1600T SEM / EDS

(MC F226A – Faculty of Mathematics and Science)



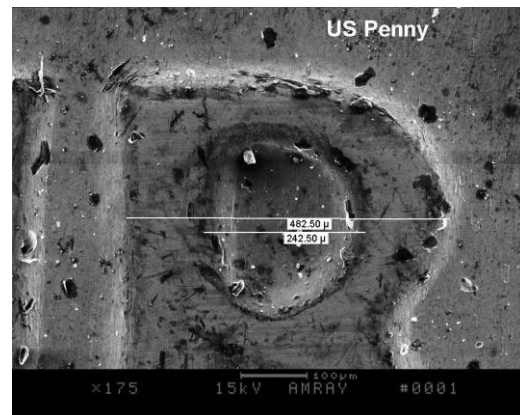
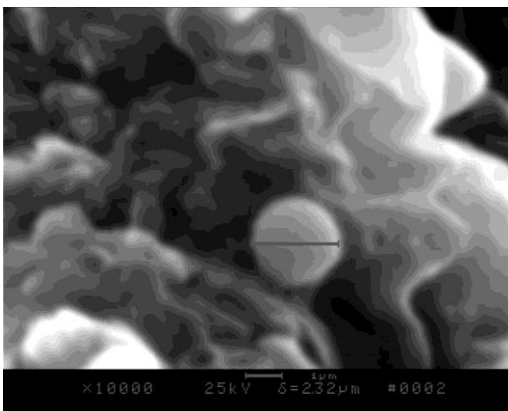
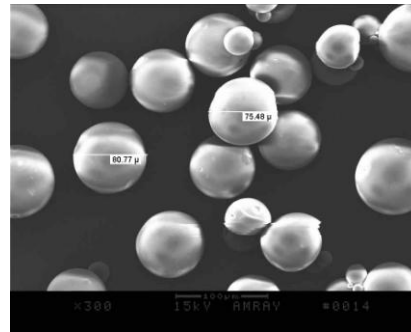
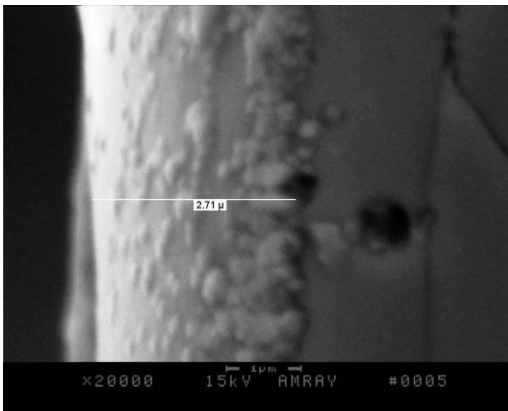
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- Magnification Range: ~15X to ~50,000X
- Specimen Size: <2.5cm diameter
- Ability to rotate and tilt samples easily
- Digital Imaging – ability to annotate (insert text, point at or outline features, etc.) and take direct measurements within images
- Energy Dispersive X-Ray Spectroscopy (EDS) Capability - Elemental analysis for Na & above on periodic table
- Semi-Quantitative Elemental Analysis
- Sputter Coater using Au/Pd source (Gold / Palladium)

Scanning Electron Microscopy

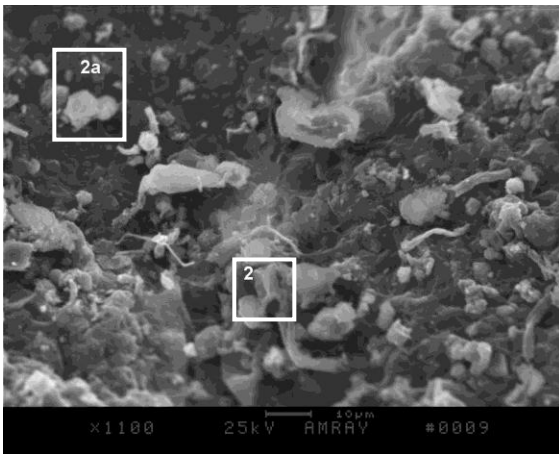
- The Scanning Electron Microscope (SEM) is a very useful tool for many aspects of science. SEM is typically used to examine the *external* structure of objects that are as varied as biological specimens, rocks, metals, ceramics and almost anything that can be observed using a light microscope.
- A biologist might use an SEM to study the tiniest micro-structures of an insect, the geologist might use it to find out what chemicals are present in a rock specimen, and the automobile engineer might use it to find tiny imperfections in a car part.
- SEM images are created using electrons instead of the photons of light - electrons have a shorter wavelength. This permits magnified imaging of a specimen by electrons up to 200 times greater than with the light microscope. The theoretical limit of magnification for a light microscope is about 2,000X whereas our AMRAY SEM can magnify and resolve a specimen up to ~50,000X.

Measurements



Energy Dispersive X-Ray Spectroscopy (EDS) Elemental Analysis

- When an element is bombarded with an electron beam, the specimen will release some of the absorbed energy as x-rays. When the sample is bombarded by the electron beam of the SEM, electrons are ejected from the atoms comprising the sample's surface. A resulting electron vacancy is filled by an electron from a higher shell, and an x-ray is emitted to balance the energy difference between the two electrons.
- The EDS x-ray detector measures the number of emitted x-rays versus their energy. The energy of the x-ray is characteristic of the element from which the x-ray was emitted. A spectrum of the energy versus relative counts of the detected x-rays is obtained and evaluated for qualitative and quantitative determinations of the elements present in the sampled volume.
- Features or areas as small as about 1 μm can be analyzed.



Lichen with Metallic
Particulate

