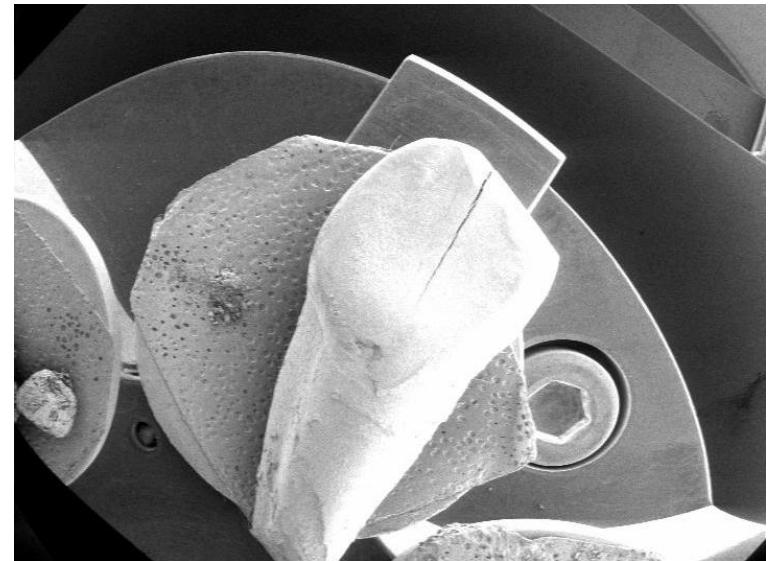
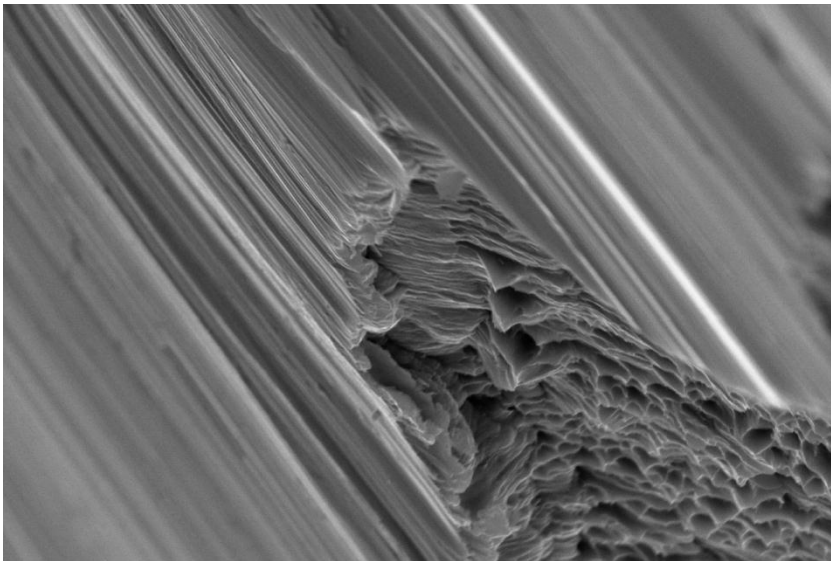


Selecting and Preparing Samples

Scanning Electron Microscope User Training

Sample Selection

The following guidelines should be considered when selecting samples.



Sample Selection

Samples should be:

- **Small** -you may cut sample to size
- **Non-hazardous**
- **Maintain ultrastructure** when dried
- **Durable**- avoid any substances would “melt” if sitting in a warm window.
Examples of such items include, but are not limited to, gummy candy, lipstick, and wax
- Able to **withstand a vacuum**
- **Conductive or non-conductive**

Sample Preparation

Once you have selected a sample it must be prepared for viewing **Sample preparation is key in obtaining quality images.** Sample preparation includes:

1. Cleaning
2. Drying
3. Mounting
4. Sputter coating non-conductive samples

Sample Preparation: Cleaning

Surface oils and debris (dirt, dust) must be removed. Cleaning not only **protects the SEM from contamination** it also improves the quality of your image.

- Surface oils can be removed by gently washing the sample with alcohol or water. Samples that have been cleaned in water or alcohol must be allowed to dry completely before examining in the SEM. Allow time for sample drying. Drying time can be reduced by placing samples in drying oven.
- Debris can be removed by gently blowing clean air across your sample.



Sample Preparation: Drying

All samples must be completely dry. The SEM will not be able to maintain a vacuum if samples are not completely dry. Use a drying oven (set at a low temperature) or other warming device to accelerate drying time.

Specimens that need drying time include:

- Samples that have been collected outdoors such as rocks, woody debris, and plant material.
- Biological samples such as plant material and insects (most biological sample will not maintain the original shape once dried)



Sample Preparation: Mounting

Samples must be securely fastened to aluminum mounts/stubs. It is essential that a large portion of the specimen is in contact with the stub. Samples can be mounted on the aluminum stubs with a variety of adhesives Below is a list of ***commonly used adhesives and recommended use.***

Double sided carbon tape

- Particles and powders
- Light specimens

Super glue*or quick dry epoxy*

- Heavy specimens such as rocks
- Odd shaped specimens such as insects or woody debris

****The use of glue requires additional drying time.*** The glue must cure for at least 24 hours. Be careful not to get glue on the portion of the sample you would like to image

Sample Preparation: Mounting

- ***The area you want to image must be exposed.*** The SEM cannot see through things.
- ***The area you want to image should be facing up.***
- You may mount more than one specimen per stub.

Sample Preparation: Sputter Coating

Sputter coating is a process used to deposit a thin layer of conductive material onto non-conductive specimens. SciTech uses a coater that deposits gold and palladium. The layer is 10-20 nm thick and does not obstruct surface features of specimens.

All non-conductive samples will be sputter coated by SciTech staff prior to your reservation.



Other Considerations

- Select multiple samples to image. Not all specimens will image well.
- Mounting supplies will be available in class.
- Please contact Erin at SciTech if you have any question about sample selection and preparation.