



University of Southeastern Philippines

College of Engineering

PROCEDURES FOR THIN SECTION PREPARATION

I. Cutting

1. A rock specimen must represent the sample and/or outcrop under observation. In the case of foliated metamorphic rocks or laminated sedimentary rocks, the sample is cut perpendicular to the orientation of the foliation or lamination.
2. The sample is cut using a 6"-diameter, 1.5mm-thick, continuous rim diamond lapidary saw blade to produce a chip having a dimension of at least 1.3"x1"x0.5" (l x w x t). There must be a continuous supply of water to lubricate the blade and the sample. Dry cutting may be considered when preparing an initial rock slab for clastic/detrital sedimentary rocks (especially for mudstone).
3. The rock chip must have a secure enclosure containing its code for reference purposes and for easier tracking.

II. Sample Impregnation

1. For semi-consolidated and/or fractured samples, sample impregnation of a rock chip/slab using a clear epoxy must be done. This can be done by mixing a known proportion of clear epoxy adhesive and hardener (usually follows a 1:1 or 2:1 ratio, depending on the brand of epoxy) which shall be poured in a silicon mould.
2. To remove unwanted bubbles, the mould shall be emplaced inside a vacuum desiccator. The vacuum pump pressure should reach up to 25 psi and duration of pumping is set to 5 minutes or until the small surface bubbling is observed.
3. Allow the epoxy to resettle and repeat the pumping process for five (5) times or until bubbles are no longer apparent.
4. Allow the epoxy to cure for at least 3 days to achieve optimal strength.

III. Grinding

1. Hold firmly and place the rock chip carefully on the grinding wheel until one of its sides becomes relatively polished. Specifically, the rock chips are grinded through a 4"-diameter grinding disc starting at grit 180# up to grit 2000#.

2. For epoxy-impregnated rock chips/slabs, the excess epoxy must be cut until convenient grinding can be done.
3. Once the rock chip is relatively polished, have it manually polished using a wet grit powder of finer size (i.e., 2500# or 3000#) disseminated on top of designated horizontally levelled glass slab until one side is finely polished. Manner of polishing may follow a number "8" figure to equally polish its surface.

IV. Cleaning and Mounting of Rock Chips

1. To remove unwanted grit powder or dust, the rock chip is soaked with ultrasonic cleaner for 2 minutes. Carefully remove the cleaned rock chip using a latex disposable glove and have it placed on top of an aluminum foil.
2. Dry the rock chips using a hot plate or laboratory oven with a temperature of 60°C for 10 to 15 minutes.
3. Mix the clear epoxy adhesive and hardener at equal amounts. Finely distribute the mixed epoxy into the polished side of the rock chip and subsequently mount it on a clear glass slide. Gently press and move the chip to squeeze out unwanted bubbles and excess epoxy.
4. Continue pressing the chip and slide for at least 3 minutes. Clip the samples equally and allow it to cure for at least 1 day.

V. Polishing

1. Use the emery powdered grits from coarse to fine (starting from grit 180# to 3000#) to prevent the glass slide from breaking. Ensure to cover the clear portions of the glass slide to protect them from fogging/being scratched during polishing.
2. Waterproof sandpaper may also be used for initial polishing.
3. Use a vernier caliper or digital micrometer to check if the desired thickness has reached 30 microns. The thin section's thickness may also be checked using a petrographic microscope.
4. Do check the rock chip from time to time when polishing.
5. Do not put too much pressure on the glass slide to prevent it from breaking.
6. Once the ideal thickness of the thin section has been achieved, protect its surface using a glass cover slip which can be mounted using clear epoxy.

VI. Point Counting

1. Determine the number of points to be counted. (300 points is the standard and minimum amount- seds; 2000 for igneous rocks)
2. Establish a 17x18 grid with a total of 306 points through the use of an x-y translation mechanical stage. (0.3 mm-interval for igneous; 0.5 mm for seds)

3. Identify the mineral at the center of the cross-hair and have it tallied. Take note of other observable textures such as crystal shape, size, habit, etc.
4. Tabulate and/or normalize the modal composition to determine the specific rock type using established ternary diagrams.

VII. Equipment Maintenance and Safety

1. The rock cutter and grinding wheel shall be periodically checked to ensure that the parts are clean, lubricated, and relatively safe to use.
2. The work area must be kept tidy and orderly.
3. All equipment must be unplugged after use.
4. The students shall be overseen by the laboratory-in-charge/faculty during operating the rock cutter and grinding wheel.
5. Wearing of prescribed PPE (e.g., clear safety goggles, gloves, ear plugs, or face mask) is a must.