POLISHED GRAIN MOUNTS

Examination of polished tops of grains encapsulated in epoxy is common in SEM studies, particularly in ore microscopy. The method has been modified for use in routine concrete and cement microscopy in which the polished surface passes roughly through the middle of particles. The grains are polished on only one surface instead of two (as in a doubly polished thin section). Hence, the grain mount may be termed a half section. With a one-particle-thick layer, grains can be examined in reflected- or transmitted-light, or both simultaneously with some microscopes. Transmitted light through a transparent mounting medium allows particle observations in three dimensions, but reflected light gives only a planar (two dimensional) view. Both have their phase-identification advantages. The section can easily be etched or stained.

In this method, non-stick paper (for example, the backing from an adhesive-backed polishing cloth) is placed on a slide warmer at 45 degrees C, a drop of epoxy is put on the paper, and the particles are added to the liquid. A clean, labeled, glass microscope slide placed on the mixture and with a light finger pressure and movement the excess epoxy is squeezed out. A weight is placed on the slide and the epoxy is allowed to harden. After hardening, the encapsulation easily separates from the non-stick paper, the excess epoxy is trimmed from the edges of the slide with a single-edge razor blade, and the sample is ready for coarse and fine polishing with diamond pastes or slurries on Buehler's TexMet or equivalent cloth. The particles can be seen at the base of the epoxy.

Grain mounts normally require no lapping with silicon-carbide papers. No. 2 rubber stopper, or a cabinet door "bumper" is affixed with Super-Glue to the back of the microscope slide, facilitating holding the slide to the horizontal polishing wheel.

The first polishing step is primarily for thinning the grain mount until broad cross sections of individual particles can be seen under the microscope. The entire preparation of the specimen surface can be done on a horizontal polisher-grinder. In the final stages of polishing, seeing the particles with the naked eye is normally difficult if the particles are, say, cement-grain size. Therefore frequent checking with the microscope is necessary until the desired thickness (usually 20 to 40 microns) and degree of polish is attained. The stopper is removed with a single-edged razor blade after final polishing or etching. If no transmitted-light observations are planned for the section, then a ceramic tile and Super-Glue can be used instead of a glass microscope slide and epoxy. The method normally requires roughly 15 to 30 minutes, depending on temperature and embedding liquid characteristics. Gridded

microscope slides are helpful for returning to a particular grain.