

## NOTES AND NEWS

### SULFUR AS A MOUNTING MEDIUM FOR POLISHED SECTIONS

GEORGE J. NEUERBURG, *University of Idaho, Moscow, Idaho.*

To investigate the semi-quantitative effects of polishing on opaque mineral optical figures, polished oriented sections of crystals were made. The majority of such crystals were small. Without suitable equipment, the problem of holding the crystals in the preferred orientation during mounting became a serious one.

Mounting such crystals in bakelite in a hydraulic press is out of the question in most cases, especially when a study of a surface parallel to (001) on an acicular crystal is desired. Holding such crystals in position, during mounting, with tweezers is satisfactory, but requires an open air mold and a mounting medium which is readily fusible and which hardens quickly.

Molds of  $\frac{1}{2}$ " diameter glass tubing,  $\frac{1}{2}$ " to  $\frac{3}{4}$ " long have been employed but molds of any material should be suitable for this work.

As a mounting medium red sealing wax was first used. This was found to be a most unsatisfactory mounting medium, primarily because it has a strong tendency to drag during the polishing process and to pit soft minerals and those minerals having good cleavages. Furthermore, sealing wax tends to become frothy when melted and not sufficiently fluid to readily fill all open spaces.

It was felt that a satisfactory mounting medium should meet essentially the following conditions: (1) it should have a minimum tendency to drag during polishing; (2) its melting point should be low enough that it will not alter the mineral, and high enough so that it will not melt from the heat of friction developed in polishing; (3) it should be readily available and cheap; and (4) it should become fluid enough on melting to fill all open spaces and should melt quietly without the formation of bubbles.

Several materials were tried without notable success. An alloy of 60% Bi, 40% Cd is suitable except for item 3 and the strong tendency to form an oxide crust on melting. Common tin solder has too high a melting point and such a high specific gravity that it floats many of the minerals to be mounted.

Sulfur was tried as a mounting medium at the suggestion of Roy Anderson, University of Idaho. This substance most nearly fulfills the conditions outlined above. It has one drawback in that the operation must be carried out under a hood because of the noxious fumes given off.

In preparing the mount, the crystal to be polished is placed in position on a glass plate and the mold placed around it. Powdered sulfur is melted in an evaporating dish over a Bunsen burner. When molten, it is allowed to stand for a few minutes, with a cover on the dish. This is done to extinguish the burning sulfur fumes and because it has been found that the molten sulfur is more fluid when this is done than when it is first taken off the flame. The sulfur is then poured into the mold and left to harden. It becomes sufficiently hard to hold the crystal in position in a matter of a few seconds; therefore, it is necessary to hold the crystal in position with tweezers but a few seconds.

In the final stages of polishing, the sulfur mount usually becomes loosened from the glass tube and falls out. If desired, this can be obviated by using brass tubing, which has been indented in the manner described by Short (*U.S.G.S., Bull.* 914, p. 9).

The mount finally obtained is brown in color and consists of relatively large, tightly interlocked crystals. The material fills all irregularities on the mineral specimen very satisfactorily.

An investigation into the possibility of using sulfur as a mounting medium in briquettes was made. Satisfactory results were not obtained. Sulfur becomes very fluid on heating under pressure and readily extrudes from the mold. Also, a uniform mount could not be obtained, apparently because of a disturbing effect from the mineral specimen; very commonly the mount was hard and crystalline everywhere except around the specimen, where it was powdery.

Briquettes of sulfur, using only pressure, were also made. Very similar results to those obtained when using heat and pressure together were obtained, though the briquettes were not quite as tough. The pressures used were of the order of 3000 to 4000 pounds.

There seems to be little doubt that careful experimentation with various combinations of pressure, time of heating, time of cooling, and time under pressure would yield a suitable sulfur briquette, but these conditions would probably involve more time than is used in preparing a bakelite briquette, and the product would probably offer no special advantages over the usual bakelite mount.

It is the author's intention to attempt to find a suitable mounting medium from which briquettes may be made by employing moderate pressures for a relatively short time, without the application of heat.

The author wishes to express his appreciation to Ray Kurtak, Chemist, Idaho Bureau of Mines and Geology, for his assistance while trying different mounting media. Also, he wishes to acknowledge aid in the preparation of specimens given him by Mr. F. L. Jackson and Mr. G. M. Glarborg, students in the School of Mines, University of Idaho.