NOTES AND NEWS

NEW DATA ON THE OPTICAL PROPERTIES OF TRIDYMITE

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Unusually large crystals of tridymite occur in the vesicles of a leucocratic andesite at the summit of a conical hill in Sec. 4, T. 23 N., R. 13 E., Plumas County, California. This locality may be reached via the road to Smith Peak branching from the Walker Mine road north of the town of Portola.

The andesite is highly vesicular and consists of phenocrysts of labradorite, 2 mm. to 3 mm. in length, set in a groundmass of andesine laths and scattered magnetite crystals with a colorless glass base. The original ferromagnesian minerals have been completely altered.

Single untwinned crystals of tridymite reach a diameter of 1 mm., and complexly twinned aggregates exceed 2 mm. in diameter. Individual crystals are thin pseudohexagonal basal tablets with ridges on the basal plane extending from the center to the intersections of the prisms. All of the common forms and twinning habits are present. Aragonite type of twinning and complex lamellar twinning analogous to that in leucite are both shown on the basal plane.

All crystals are optically biaxial with the optic plane normal to the basal plane and a face in the prism zone. Assuming the customary orientation with the optic plane as (100), then $X=b$, $Z=c$. The optic sign is positive. The usually assumed orthorhomic character is not disproved by any observations.

2V was measured with the universal stage on basal plates mounted in balsam. Values determined from the measurement of fifteen crystals range from 66° to 90°. In nine of the fifteen crystals measured 2V is between 80° and 89°. Measurements on separate twin parts of the same crystal yielded different values as is indicated by the following pairs: 77°–81° and 75°–84°. Repeated measurements on the same twin sector gave consistent results.

The indices of refraction as determined in oils with sodium light are as follows:

$$\alpha=1.478\pm$$
$$\beta=1.479+$$
$$\gamma=1.481\pm$$

The probable limits of error are ± 0.001. An independent determination of the double refraction in a thin section 120 microns in thickness gave a value of 0.0025 ± 0.0002.

The indices of refraction are higher, the size of 2V is larger, and the double refraction is lower than some published values. Various published data are not in agreement and this is perhaps due to the difficulty of working with the usually very small crystals. The large variation in the size of 2V is probably due to uneven strain on inversion from the higher temperature hexagonal form. It is believed that the data given here are unusually good in view of the greater ease of handling and certainty of determination of the larger crystals from this locality.

A MOUNT FOR THE UNIVERSAL STAGE STUDY OF FRAGILE MATERIALS

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The accessory here described is intended for use in the immersion method of grain study on the universal stage. It serves two purposes: (1) to minimize strains sometimes introduced in grains by the pressure from a hemisphere, which strains might cause changes in the optical properties or result in the shattering of fragile grains (e.g., organic crystal fragments), and (2) to facilitate the controlled movement of a grain (e.g., centering) after a mount is made and is ready for study. The accessory is a metal slide which acts as a retaining cell for the mount. A single grain or crystal is mounted in the immersion liquid between two cover glasses which are held in this retaining cell. The metal slide supports the weight of the hemisphere and its extension permits movement of the entire unit for the centering of the grain.

Slide: The metal slide, whose details are shown in Fig. 1, is turned out of sheet brass on a lathe. The central opening is slightly larger than the diameter of the cover glasses (clearance not over 0.15 mm.). The cover glasses must neither bind in the opening nor shift to a large extent when the stage is tilted. The shoulder encircling the central opening is divided into concentric rings to improve the retention of the immersion liquid.

The thickness of the slide at the shoulder will depend upon the average size and uniformity of the grains studied. The surface of the upper cover glass must be even with, or slightly below, the top of the brass slide. In this way the grain is held in place by the weight of the cover glass augmented by little or no pressure from the hemisphere. The dimensions shown in Fig. 1 have proven generally satisfactory. If applicability to greater variation in grain size is desired, the thickness may be that of three No. 2 cover glasses and the grains accommodated by appropriate combinations of No. 1 and No. 2 cover glasses.