

back-reflection region. The midpoints are of course known to the same accuracy. A comparison of the midpoints with the positions of the M's yields the permanent corrections  $\Delta_1$  and  $\Delta_2$  to be applied to the latter. It is convenient to set the M of the forward-reflection region at the reading  $100.00 - \Delta_1$  mm. on the film reader.

It might be argued that because the position of the M's is found with the help of a powder pattern, the accuracy with which it is known is no better than that with which the midpoints are measured for each film in turn using the customary procedure. This is not the case because for calibration we can choose a powder sample that gives sharp lines to high  $2\theta$  angles, whereas with the usual procedure one has to take the pattern as it comes. We have, for example, found the reproducibility of the readings to be no better than  $\pm 0.03-0.05$  mm. on several patterns of organic compounds.

If one does not wish to assume uniform film shrinkage, additional calibration sights can be mounted on the ring and fiducial distances determined as described above.

#### REFERENCE

1. DIEKE, G. H., DIMOCK, D. AND CROSSWHITE, H. M. (1956), *J. Opt. Soc. Amer.*, **46**, 456

THE AMERICAN MINERALOGIST, VOL. 44, JANUARY-FEBRUARY, 1959

#### BRANDTITE AT THE STERLING HILL MINE, NEW JERSEY

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Brandtite has been identified among specimens collected at the Sterling Hill mine, New Jersey, in 1940. So far as is known, this marks the first time that brandtite has been recognized from a United States locality, and adds one more mineral to the ever growing list of species that have been found at the Franklin and Sterling Hill mines.

The brandtite was found at Sterling between the 1400 and the 1500 foot levels. This portion of the orebody contained ore of two distinct types, which were mined and processed separately: the "black willemite" and the "brown willemite" ores. The former is a very fine-grained intergrowth of franklinite and willemite; the latter is coarse grained and consists essentially of brown willemite and calcite, with some franklinite. Sphalerite is also usually present up to several per cent, as an ore constituent. The brandtite-containing vug was found in the hanging wall of a black willemite stope, at a point where over-breakage had trespassed slightly into the adjacent brown willemite orebody. The cavity was a crack about two feet long lined with drusy and hairlike crystals of several

minerals. It was in the roof, which was very solid and hardly accessible, and only a few small specimens of matrix containing less than a gram of brandtite altogether could be collected.

The crystals are colorless, up to 8 mm. in their longest dimension, seldom as much as 1 mm. wide, and 0.2 mm. or less in thickness. Associated minerals are rhodochrosite as a fine grayish-pink drusy coating; chalcopyrite, as minute groups of crystals; an unidentified pink mineral as a thin powdery coating of crystals; and an unidentified transparent red mineral in rare crystals. These latter are square, tabular, apparently tetragonal, and have a luster and color similar to proustite. The ground-mass consisted of a coarse intergrowth of calcite, franklinite, brown willemite, and sphalerite.

The brandtite crystals are simple and show the following forms in the unit and orientation of Dana (1951): *b*, *a*, *m*, *p*. Their habit is slender, prismatic, unlike the crystals from Harstig, Sweden, which are more nearly equant. Cleavage {010} perfect and {001} good. Colorless, transparent. Optically, the crystals are biaxial positive, with  $\beta = 1.7070$  and  $\gamma = 1.7215$ .  $r < v$ , very strong.  $2V$  small,  $\cong 15^\circ$ .

X-ray powder photographs and single-crystal rotation and Weissenberg photographs confirmed that the material is identical with brandtite from Langban, Sweden. Insufficient material was recovered for chemical analysis, and the observed optics were close enough to those of brandtite from the type locality so that no major variation in the constituents would be expected.

THE AMERICAN MINERALOGIST, VOL. 44, JANUARY-FEBRUARY, 1959

#### CALIBRATION OF SINGLE-CRYSTAL WEISSENBERG FILMS

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To supplement the calibration methods for Weissenberg films described in this *Journal* by Christ (1956) and Pabst (1957), it might be of interest to mention a simple method used in this laboratory for several years.

The crystal is mounted on a thin wire (*ca.* 0.1 mm.) of some pure metal with accurately known spacing values (Ag, Al, Pt). The drawn-out powder lines of the metal are superimposed on the Weissenberg pattern of the crystal over the whole width of the film, as shown in Fig. 1.

This method has the advantage that no alteration of the Weissenberg camera is necessary, the change of goniometer heads (with possible mis-setting errors) is obviated, no double or triple exposures are needed and