

such laboratory conditions can be adequately controlled and can approach in some measure those found in nature.

2. The use of colloidal media such as silica gel is suggested as a method of obtaining such control.

3. The authors have undertaken a detailed study of the effect of acidity, presence of inert substances, concentration and diffusion phenomena on the formation of crystals.

4. Preliminary experiments with lead iodide, mercuric iodide and calcium carbonate, carried out to obtain a general idea of the difficulties involved and to develop an experimental technique, indicate the following: (a) Rate of crystal growth in the cases studied is not affected by the acidity of the medium. (b) Unstable polymorphous forms may be held in 'suspended transformation' long enough for convenient study. (c) Concentration and acidity have a very decided influence on crystal form. In some cases the two factors are interdependent. (d) Studies of calcium carbonate indicate that the conditions determining which crystal form a substance may take (i.e. calcite or aragonite) are within experimental reach.

---

### BARYSILITE FROM FRANKLIN FURNACE, NEW JERSEY

E. V. SHANNON, *U. S. National Museum*

AND

H. BERMAN, *Harvard University*

Barysilite, a lead silicate hitherto known only from Långban and Pajsberg, has recently been identified at Franklin Furnace. It was found on the picking table in a few small masses and its chemical character was first recognized by members of the staff of the chemical laboratory of the New Jersey Zinc Company. Material was sent by them to the Harvard Mineralogical Laboratory, together with a preliminary analysis. It was at first thought to be alamosite but its true nature appeared when the analysis given below had been made on purer material.

The barysilite occurs, in the single specimen examined, as a massive, pink to colorless mineral, associated with yellow garnet and colorless willemite. There are, however, occasional druses of minute pink crystals of the mineral, too small for crystallographic

measurement. The habit is strikingly different from the Swedish occurrences of barysilite in that the grains seem to be equidimensional rather than curved lamellar.

The separation of barysilite was made by Berman with the aid of Clerici<sup>1</sup> solution. Some remaining garnet was taken out by the use of the electro-magnet, the garnet being slightly more magnetic than the barysilite. The remaining willemite, after the heavy solution separation, was so far as possible picked out by hand. The sample, of which 0.3 of a gram was available, was approximately 90% pure as shown by the analysis.

The optical constants were determined by the immersion method, and are as follows:

The mineral is uniaxial negative with  $\epsilon \perp$  to the basal cleavage.

	Optical character	$\omega$	$\epsilon$
Barysilite <sup>2</sup> —Pajsberg	Uniaxial negative	$2.07 \pm .01$	$2.05 \pm .01$
Barysilite—Franklin	Uniaxial negative	$2.05 \pm .01$	

The purified sample was analyzed by Mr. Shannon with the following results:

	1. Per cent	2. Mol. Ratio	3. Recal. to 100% after deducting garnet and willemite	4. Mol. Ratio	
SiO <sub>2</sub>	18.73	.311	16.96	.281	
Al <sub>2</sub> O <sub>3</sub>	1.76	.017		.281 = 2 × .140	
PbO	71.14	.318	80.24	.359	
FeO	0.24	.003		} .398 = 3 × .133	
CaO	0.10	.002			
MgO	1.02	.025			
MnO	3.97	.056	2.80		.039
ZnO	1.69	.020			
H <sub>2</sub> O+105°C	0.63	} .040			
H <sub>2</sub> O-105°C	0.10				
Total	99.38		100.00		

Since it was known that garnet and willemite were present in the sample, it was considered that garnet would account for all the alumina and most of the bivalent oxides except ZnO, PbO, and some MnO; willemite was estimated on the basis of the ZnO

<sup>1</sup> H. E. Vassar. *Am. Mineral.*, 10, 123 (1925).

<sup>2</sup> E. S. Larsen. *Bull.* 679, *U. S. Geol. Survey*, p. 44.

present. The water was disregarded. It thus appeared that the sample was composed as follows:

	Per cent
Lead silicate	88.66
Garnet	7.69
Willemite	2.29
Water	0.73
	99.37

The lead silicate, recalculated to 100% gave the figures in Column 3 and the molecular ratios as shown in Column 4 correspond reasonably closely to the formula  $3(\text{Pb, Mn})\text{O} \cdot 2\text{SiO}_2$  which is that of barysilite.

The mineral is easily fusible to a blackish purple glass. It is slowly decomposed by hot concentrated hydrochloric acid with separation of silica.

## PROCEEDINGS OF SOCIETIES

### PHILADELPHIA MINERALOGICAL SOCIETY

*Academy of Natural Sciences of Philadelphia, March 11, 1925*

A stated meeting of the Philadelphia Mineralogical Society, held on the above date, was attended by twenty-seven members and six visitors. Vice-president Arndt presided in the absence of President Vaux.

Mr. Karl Kugler, of Philadelphia, was elected to junior membership.

Announcement was made that in accordance with the amendment to the By-Laws, recently adopted, the society will hereafter meet on the first Thursday of each month, excepting July and August.

The society was addressed by Mr. J. W. Radu, of New York City, on "*The Orientation and Cutting of Gem Minerals.*" The geometrical proportions of the perfect "brilliant" cut were first described. In this form the gem has 58 faces, arranged in three principal regions, which are called respectively the table, the girdle, and the culet.

Zonally colored minerals, such as sapphire, emerald, or amethyst, should be cut so that the culet lies in the zone of deepest color. Even if the remainder of the stone is colorless, the whole will then appear colored when viewed from the top. Dichroic minerals should be cut with the axis of the culet perpendicular to the *c*-axis of the crystal.

Synthetic rubies and sapphires usually have their *c*-axis perpendicular to the longest axis of the "boule," as the uncut synthetic crystal is called. The boules are very unstable and shatter very readily when struck. The synthetic rubies are cheaper than the sapphires because their boules usually break into larger pieces, and are therefore more easily cut.