

due to loss of water (contained as (OH) in the crystal) and give an odor of fluorine. Some B_2O_3 also may be lost. Tourmaline has been synthesized from such glass when no added fluorine was present in the solution, indicating that most or all of the original fluorine can be replaced by hydroxyl. Differential thermal analysis of a black, high-iron tourmaline revealed an endothermal break (melting) at about 1050° C. immediately followed by a sharp exothermal break presumably representing partial crystallization of a transient complete melt. No thermal breaks were observed below 1050° C.

Synthetic tourmaline made at 500° from a high-iron glass with $G=2.67$ and $n=1.582$, prepared by melting black tourmaline with $G=3.16$ and $O=1.647$, was pleochroic in minute crystals and varied in indices with O for the most part over 1.65. Material with much lower indices, reflecting variation in the composition of the tourmaline, has been made from such glass by adjusting the composition of the solution which effects the re-crystallization.

The work here described is being carried on in the laboratories of Baird Associates, Inc., Cambridge, under a development contract with the Squier Signal Laboratory, U. S. Army Signal Corps, Fort Monmouth, New Jersey.

OCCURRENCE OF BARITE AT PILOT KNOB, MISSOURI

ALBERT J. FRANK AND CORNELIUS S. MOYNIHAN,
Saint Louis University, Saint Louis 8, Missouri.

A specimen of felsite containing hematite was found at the top of a chute leading to a dump on the north side of Pilot Knob. The surface of one side of this specimen is covered with a series of vesicles which appear to be gas holes along a flow surface. Almost all of these vesicles contain orthorhombic crystals of colorless barite ranging in size from those barely visible with a hand lens to the largest with a vertical axis almost one half an inch long; nearly all of these can be described as bladed. They were identified optically as they have the correct indices and optic sign of barite. Besides these crystals show characteristic striations parallel to the length and give the yellow-green flame of barium.

Further study has revealed that these crystals can be found *in situ* near the top of the Knob in cavities in a pyroclastic ferruginous agglomerate. Barite crystals were also found *in situ* in cavities in the main pit; the rock here is a hematitic rhyolite porphyry containing a few xenoliths of red rhyolite. Many of these cavities contain quartz crystals with the barite on the quartz and therefore later than the quartz. If the rock was coarse grained, these cavities could be described as miarolitic.

In fact, they probably formed as gas pockets in which the quartz and barite crystallized. Thus the sequence of the mineral formation can be made out, namely, hematite, quartz, then barite.

The barite occurrence at Pilot Knob has been described by Crane (1), who mentions many small white inclusions of barium sulfate in the ferruginous porphyry which gives it a flecked appearance. He also noted light pink barite "cementing joint and bedding planes in the ore and as small crystals lining cavities in the associated rocks" (2). He states that the light pink barite is secondary.

While the occurrence has been noted, its significance has never been adequately discussed. The barite is of magmatic origin as it occurs high up on the Knob in igneous rock beyond any sedimentary cover. In fact these Precambrian porphyry hills were probably all above water during most of the Cambrian. This barite could not have come from the sedimentary rocks of the area as these formations never covered the Knob. Certainly the occurrence is at a sufficient altitude to preclude any artesian circulation as a possible agent of barite deposition.

The barite had the same source as the hematite. Some might say that both hematite and barite are primary, especially in the rhyolite porphyry but much more likely they are due to magmatic ore bearing solutions.

Any argument that the barite has been leached from the surrounding porphyries only strengthens the fact that the barite is magmatic, a fact which Crane seems to have recognized for his white barite without explicitly saying so.

While this occurrence shows that magmatic barite certainly exists in Missouri one must be careful not to hastily conclude that all barite in Missouri has a similar origin, although it does seem more than chance that the order of quartz followed by barite is the same as found by Tarr (3) for the barite district and also for what seems to be a truly magmatic barite vein in granite also found by him (4).

To show the necessity of the care which must be used in regard to origin, mention should be made of a very recent discovery of barite in the Fern Glen Shale of Mississippian age. Quartz geodes occur in the upper green shale bed at Mountain Ridge, Missouri. Study of one of these selected at random revealed that it contained colorless, striated, orthorhombic barite with the correct indices, interference figure, optical sign, etc. The barite rests on quartz crystals, as also does calcite, and undoubtedly the order of mineral deposition is quartz followed by barite and calcite.

Some might argue that this barite is due to rising magmatic waters which were stopped by the shale or met conditions in the shale necessitating precipitation of quartz and barite. While this barite might well be

due to magmatic waters, acceptance of this idea of magmatic origin means acceptance of the difficulty of the passage of these waters through a rather thick sedimentary section. On the other hand a descending meteoric origin requires rocks above the Fern Glen which contain or did contain barite. Any artesian theory inherently has difficulties similar to both of these theories.

Thus the necessity for a reinvestigation as to whether commercial Missouri barite is sedimentary or magmatic, or both, becomes apparent.

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NAMING OF MICROSCOPIC ORE MINERALS

ERNEST E. FAIRBANKS, *158 West St., Biddeford, Maine.*

The microscopical examination of polished ore specimens by means of reflected light frequently reveals opaque or other ore minerals of microscopical dimensions. In order that other investigators may be able to identify such minerals as having been previously described they should receive a special name. Those of us interested in the special subject, mineragraphy, recognize that the usual type of name conflicts with existing rules governing nomenclature. In order to avoid this controversial subject I offer the suggestion that all minerals of homogeneous character from which a considerable amount of mineragraphic data have been obtained, be given a distinctive name accompanied by the prefix "micro." Thus the "micro" prefix can be dropped when and if the mineralogist eventually recognizes the mineral involved as an authentic new species. On this basis the name "dunhamite" which I recently proposed would become "micro-dunhamite." Mineragraphers with whom I have discussed this matter are in hearty favor of some such special designation.