A large cleavage piece of pale pink bustamite from Franklin Furnace kindly presented to the U. S. National Museum by Mr. R. B. Gage of Trenton, N. J., has the following optical properties:

Optically−, 2 V medium. $\alpha=1.667$, $\beta=1.678$, $\gamma=1.680$.

Fragments lying on the most perfect cleavage show the emergence of X out of the field and give variable but small extinction angles. Several specimens from Franklin Furnace that superficially resembled the bustamite were examined microscopically and proved to have optical properties much like those of the fowlerite variety of rhodonite, though with somewhat lower indices of refraction.

Conclusion: The bustamite from Franklin Furnace is a triclinic pyroxene, related to rhodonite. Chemically it contains nearly equal molecular proportions of CaO and MnO with CaO in slight excess. In optical properties it differs considerably from rhodonite. Out of ten specimens of bustamite and rhodonite, mostly from Franklin Furnace, that have been examined optically, two had properties very near those of the analyzed bustamite, six had properties near those of fowlerite, a variety of rhodonite, while one had properties about midway between the rhodonite and bustamite. It, therefore, seems probable that bustamite is a subspecies of rhodonite with the approximate composition $CaO.MnO.2SiO_2$. Further work to finally determine this is desirable, and the authors would like to obtain samples of calciferous rhodonite and bustamite for optical study to determine to what extent replacement of MnO by CaO takes place in rhodonite.

ALTERATION OF SILICATES BY SONSTADT'S SOLUTION

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In the preparation of samples for analyses while engaged in an investigation of the zeolites of Nova Scotia, the writer learned that Sonstadt's mercuric potassic iodide solution may not be used either for separations or for specific gravity determinations in the case of some of the zeolites, owing to the readiness with which the minerals are changed by the substitution of potash for soda and lime, accompanied by a large loss of water and an increase in density.

The classic experiments of Lemberg[1] showed that alterations of this type are common when zeolites rich in lime or soda are

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[1] Lemberg, *Zeit. deutsch. geol. Gesell.*, 28, 546.

treated with strong solutions of potash but most of his experiments were carried out in sealed tubes at high temperatures and extended over long periods of time—usually several months. The writer's observations show that in the case of gmelinite and okenite the substitutions are almost instantaneous and that for the former it is almost complete in the short time usually employed in specific gravity determinations.

In the case of gmelinite from Pinnacle Island, Nova Scotia, it was noted during the separation that there was a marked tendency for a portion floating on the surface to gradually sink so that sharp determinations and separations were not possible. The analysis of the gmelinite separated by Sonstadt's solution is shown in column I. As substitution of potash was suspected, a sample from Long Island, another of the Five Island group, was separated by methylene iodide and analysed, column II. A part of this same sample was placed in Sonstadt's solution for about twenty minutes and analysed with the result shown in column III. (Analyses by E. W. Todd.)

	I	II	III	IV	V
SiO_2	51.66	50.24	49.02	56.02	55.08
Al_2O_3	17.88	17.93	18.42	0.26	0.26
Fe_2O_3	.....	0.37	0.34	0.12	0.20
CaO	1.42	.41	.30	26.46	26.57
MgO	......	......	......	0.24	0.12
Na_2O	1.54	10.08	1.20	0.28	0.76
K_2O	11.16	.69	14.86	2.24	0.60
H_2O	15.86	20.38	16.27	13.25	16.13
CO_2	......	......	......	1.58	0.32
	99.52	100.10	100.41	100.45	100.04
Sp. gr.	2.135	2.045	2.090	2.388	2.333

The gmelinite which had been treated with Sonstadt's solution was no longer vitreous in luster. It was dull and earthy in appearance and crumbled readily to a fine powder. Similar results were obtained in the case of okenite from Morden, N. S. Column IV is an analysis of a sample treated with Sonstadt's solution, and column V represents the composition of a second sample prepared from the same specimen by using bromoform and carbon tetrachloride. (Analyses by E. W. Todd.)

The limitations indicated in the use of Sonstadt's solution have doubtless been observed by others but in the writer's opinion it is desirable to keep these results in mind in the selection of a suitable heavy solution for separations of hydrous silicates readily decomposed by acids. Possibly other analyses of zeolites exhibit irregularities due to similar substitutions.

DELAFOSSITE FROM KIMBERLY, NEVADA

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Of the numerous copper minerals, one of the rarest and most interesting is delafossite, a cuprous metaferrite, with the formula, $CuFeO_2$ or $Cu_2O \cdot Fe_2O_3$. Delafossite was first described from the region of Ekaterinburg, Siberia, by Friedel in 1873.[1] No further mention of the mineral was made until 1913, when the writer[2] called attention to its occurrence at Bisbee, Arizona, and was able to establish it as a valid mineral species.

The object of this note is to place on record the discovery of delafossite at a second American locality. A specimen of the mineral in question was sent to my colleague, Professor W. F. Dietrich, by Mr. M. L. Crandall, Chief Engineer of the Consolidated Coppermines Company. The specimen was found on the 1200 ft. level of the Alpha mine (formerly called the Giroux) at Kimberly, Nevada. According to Mr. Crandall, "It was found in a body of clay containing some oxidized copper ore, occurring in oxidized jasperoid, near its contact with limestone."

Description of the Delafossite: The Kimberly delafossite is a black metallic mineral and occurs in spherical aggregates from 1 to 3 mm. in diameter which are disseminated through a white to pale gray clay. (The clay is probably halloysite, the amorphous equivalent of crystalline kaolinite, as it is optically isotropic and has an index of refraction of $1.543 \pm .003$.) The spherulitic aggregates have a fairly well defined radial structure and hence may be called spherulites. Spherulites of minerals with metallic luster seem to be very rare. The individual crystals of the spherulites have an imperfect cleavage parallel to their length. On the exterior of the spherulites the delafossite shows imperfectly developed crystals of triangular outline, which recalls the fact that delafossite is hexagonal in crystallization. The mineral has a hardness of about 5½ and is very slightly magnetic. It has a black streak.

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[1] *Compt. Rend.*, **77**, 211.

[2] *Amer. Jour. Sci.*, [4] **35**, 290.