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WITH TWO PLATES.

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Art. XXXI.—*Gageite, a New Mineral from Franklin, New Jersey;* by Alexander H. Phillips.

Attention has been drawn to the probable existence of another new mineral from this locality by Prof. Penfield in his description of leucophœnicite,* but as very little of the same material came to the surface from the mine until the fall of 1909, nothing further was ever done in the matter. For the last six months Mr. R. B. Gage of Trenton, N. J., for whom the mineral now described is named, has been collecting material for an analysis. Through the aid of Col. W. A. Roebling of Trenton, who was willing to sacrifice his best specimen, ·04 of a gram of well-crystallized material were obtained, and used by Mr. Gage with the results here given:

			Ratio.	
SiO_2	24·71	·412		1·49
MnO	50·19	·707		
ZnO	8·76	·107	1·109	4·00
MgO	11·91	·295		
H_2O	[4·43]	·246		·9
	100·00			

Letting R stand for the metallic oxides, the ratio of SiO_2 : RO : H_2O is as 1·49 : 4 : ·9, yielding the formula $(RO)_8(SiO_2)_3 \cdot 2H_2O$. Just how the water is related to the oxides, there was not enough material to determine, as in fact the water in the analysis is determined by difference. A large amount of the burden of error will therefore lie in that portion of the analysis; it is certain, however, that there is considerable water in the molecule. From the empirical formula, gageite would seem to be closely related to leucophœnicite, if not one of the probable series mentioned by Prof. Penfield.

Before the blowpipe the clear crystals assume at once a light bronze color, which darkens on further heating to a deep bronze, or nearly black, but they do not fuse. In the closed tube it yields water with the same change of color. The crystals dissolve at once in warm dilute nitric acid; upon heating this solution after the addition of a little silver nitrate and a small crystal of ammonium persulphate a very distinct permanganate color is obtained; a single small crystal will yield this test.

All the specimens of gageite thus far obtained are from the Parker Shaft. It is well crystallized, the crystals are clear and colorless, with a high vitreous luster, delicate, acicular and hair-like, often radiated and grouped in bundles extending out from

* This Journal, viii, 351, 1899.

the walls of small cavities, not unlike the habit of millerite. It may occur as a matt of interlocking crystals, or fan-shaped groups. Under the microscope the prism angles seem to be well developed, and several of the larger crystals are terminated by a pyramid. While no measurements of the angles have as yet been attempted, it is hoped that the crystalline elements and the important forms may be established in the near future from the material at hand.

The specimens thus far found have been associated with crystalline zincite, green willemite, calcite, while leucophœnicite has always been present, serving as a support for the gageite crystals. The same combination of agencies which produced leucophœnicite has also produced gageite, but as the ultimate product of crystallization.

Princeton, N. J., June 6, 1910.