CHALCEDONY MISTAKEN FOR AN IRON SULFATE MINERAL[1]

EDGAR T. WHERRY AND MILTIADES L. GLENN
U. S. National Museum and Erie, Pa.

IN THE mineral collection of the U. S. National Museum there have been for many years two specimens of an orange-brown botryoidal mineral labeled glockerite. According to the catalog they were collected by Dr. Oscar Loew in 1874. Recently Dr. E. S. Larsen of the U. S. Geological Survey, in the course of compiling data on the optical properties of all available mineral species, examined fragments from these specimens but found them to be totally different from other glockerites, and suggested that analysis of them would be desirable. The Museum accordingly sent samples of both materials to Mr. Glenn, who has contributed the analytical data. Their properties and composition are recorded, in Table 1 (see opposite page) to emphasize the need for the thoro study of unusual-looking minerals, in order that they may be correctly labeled in collections.

Interpretation of the results: The specimens are evidently merely chalcedonic silica, containing ferric sulfate and water as impurities. It is interesting to note that the index of refraction and specific gravity, properties which are especially sensitive to changes in water content, show a definite inverse relation to this factor; thus for pure chalcedony the index is 1.537, for the specimen containing about 2% water 1.530 and for that containing over 3% water 1.525. Correspondingly, the specific gravities are 2.60, 2.57, and 2.55. Specimen 8430 agrees optically with what has been called lutecite, while 8431 is normal chalcedony. The ferric sulfate is not a stain, for it is not extractable by water nor by acids. It is not present as visible inclusions, for under the highest powers of the microscope the color of the mineral grains is entirely uniform. It must therefore be present in submicroscopic inclusions.

In conclusion, it may be pointed out that while the properties of this mineral agree in a rough way with the descriptions of glockerite given in the text-books, some tests should certainly have been made before it was so labeled. The use of something besides mere superficial aspect for identification can not be too strongly urged.

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TABLE 1. PROPERTIES OF THE SPECIMENS

U. S. N. M. catalog number	8430	8431
Locality	Pinos Altos, New Mexico	Esmeralda Lode, Black Hawk, Colorado
Occurrence	Coating on pyrite and vein-quartz	Outer surface of chalcedony coating pyrite and vein-quartz
Color (Ridgway)	11 i. Orange rufous (55% orange and 45% black)	
Luster	Waxy-vitreous	
Hardness	7	
Specific gravity	2.57	2.55
Crystallization	Amorphous in appearance	
Structure	Botryoidal	
Fracture	Conchoidal	
Under the microscope	Pale orange irregular grains; with crossed nicols shown to be cryptocrystalline, and in part radiating-fibrous	
Optical properties:		
Mean index of refraction	1.530	1.525
Double refraction	.008	.008
Elongation optically	+	−
Extinction	Oblique, 20–30°	Straight
Qualitative tests	SiO_2 and traces of Fe_2O_3, SO_3 and H_2O	
Composition:		
SiO_2	94.37	93.94
Fe_2O_3	3.10[a]	1.58
SO_3	1.47[a]	1.00
H_2O below 110°	tr.	0.65
H_2O above 110°	1.86	2.59
Totals	100.80[a]	99.76

[a] Somewhat high, since a minute amount of pyrite could not be separated from the material analyzed.