

THE COMPOSITION OF SELENIFEROUS  
SULFUR

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Selensulfur is classed by Dana<sup>1</sup> as a mineral species, No. 4, and is described as "a reddish brownish mineral containing sulfur and selenium, but in unknown proportions." Several months ago an authentic specimen of this mineral was procured from the United States National Museum for analysis. It showed such small amounts of selenium, as compared with the artificial alloys of these elements which have been prepared, that the suggestion was made that the term "seleniferous sulfur" would be more appropriate for it than selensulfur and that it should be regarded as a variety of sulfur rather than as an independent mineral species.<sup>2</sup>

In order to ascertain whether the small amount of selenium was unique in the particular sample analyzed, or was characteristic of the material in general, an attempt was made to obtain for analysis additional specimens of the mineral from as many different localities as possible. Six specimens, in addition to that previously analyzed, were secured, as follows: two each from the National Museum (thru Dr. Wherry); the Mineralogical Museum of Columbia University (thru Prof. Moses and Dr. Wherry); from the Museum of the Mineralogical Department of the University of Pennsylvania, thru Prof. Amos P. Brown.

Selected portions of the minerals were powdered and treated with bromine, and the selenium was determined by the method of W. Smith<sup>3</sup>. The bromide of selenium was decomposed by the addition of successive small amounts of bromine water, the solutions were filtered and the selenium precipitated from the combined filtrates by potassium iodide and hydrochloric acid. The solution was boiled to convert all of the selenium to its black modification, filtered thru a Gooch crucible, the precipitate washed with hot water, and the selenium finally weighed as the element. The results are shown in Table 1, page 117.

No. 1 is the specimen previously studied, described in the paper above cited. In this the material was mixed with lava, and the Se-content of the rock as a whole was obtained and recalculated to 100% of sulfur+selenium. In the others practically everything went into solution in bromine. No. 7 was peculiar in being unusually dark in color, and in developing more heat than the others when treated with the bromine, but only an unweighable trace of selenium was present; this result was confirmed on a duplicate sample. Evidently the brown colors of seleniferous sulfur are not connected with the selenium content,

<sup>1</sup>System of Mineralogy, 6th ed., 10, 1892.

<sup>2</sup>*Am. J. Sci.* [4], 42, 132-4, 1916. <sup>3</sup>*J. Ind. Eng. Chem.* 7, 849, 1915.

for pale yellow specimens may contain much more of this element than deep brownish ones.

The above results show that selenium is uniformly present in

TABLE I. ANALYSES OF SELENIFEROUS SULFUR.

No.	Locality	Source	Color	Formation	Se content
1	Kilauea	U. S. N. M. 12901	Orange	Volcanic sublimate	5.18 %
2	New Zealand	Univ. Pa., Cope coll.	Pale orange-yellow	Volcanic sublimate	0.298
3	Lipari	Col. Univ.	Pale brown-yellow	Volcanic sublimate	0.285
4	Lipari	Col. Univ.	Pale yellow	Volcanic sublimate	0.272
5	New Zealand	U. S. N. M. 48056	Orange-yellow	Deposit from solution	0.195
6	Sicily	U. S. N. M. 60864	Brown-yellow	Deposit from solution	0.070
7	Sicily	Univ. Pa.	Brown-yellow	Deposit from solution	Trace

very small amounts in the so-called selensulfur, so that the appropriateness of regarding this as a variety rather than a species, and of naming it seleniferous sulfur, is established.

## THE ASSOCIATION OF PYRITE AND STILBITE IN NEW JERSEY

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The surprising rarity of pyrite in the zeolite localities of New Jersey, as remarked by Prof. J. Volney Lewis<sup>1</sup>, has given rise to a careful examination, by the writer, of the associations at various localities. The Paterson localities failed to add anything new, but several specimens from Lambertville and Moore, N. J., supplied to the writer thru the kindness of Professor Marcus Farr and Mr. Ralph H. Cutler of Princeton University, reveal the presence of this mineral in appreciable quantities. It occurs as a lustrous coating of small crystals on calcite and stilbite, and as well formed individuals evenly distributed over large specimens of light colored stilbite. Occasionally individual crystals may be observed enclosed in the stilbite and calcite, but this is exceptional, most of the pyrite being superficially implanted on the stilbite during the last stages of stilbite deposition. The pyrite crystals are usually cubical, often with small octahedral faces. They are simple or multiple crystals, varying in size from  $\frac{1}{2}$  mm. to 2 mm., and possess a brilliant luster. Beautiful groups of interpenetration twins and drusy clusters are frequently observed. Chalcopyrite may be present in masses varying in size, but well formed crystals are not associated with the pyrite.

<sup>1</sup> *Am. Min.*, 1 (6) 92, 1916.