

ART. VIII.—*Argento-jarosite; a new silver mineral; by C. A. SCHEMPP.*

The object of this paper is to establish the discovery of a new mineral found at the Tintic Standard mine, located at Dividend, Utah. The work is as yet incomplete, but enough has been done to firmly establish the existence and general character of the mineral.

On Aug. 19, 1922, while drifting on the 900-level of the Tintic Standard mine, a yellow streak was found which carried very high silver values, assays on the ore running 300 to 1200 oz. per ton. The mineral itself was so finely disseminated through the rock, it was not readily recognized. The extremely high average value of this section of the ore body led to attempts by mine samplers to identify the silver-carrying mineral. In February, 1923, this streak opened up into a large body of ore, and pure specimens could be easily obtained.

The pure mineral is yellow in color, brilliant, flaky, having a micaceous appearance. It occurs in a post-mineral fault through the ore body, of which the principal minerals are anglesite, barite, and quartz. Traces of argentite remain associated with the other minerals, in small pores and vug holes. It is imbedded in the breccia in thin layers, sometimes one-fourth of an inch thick, and in vugs, forming little balls of the pure mineral.

For my analyses it was necessary to make a comparatively large sample, about fifty grams. For the iron determination the ore was decomposed by a fusion, using sodium peroxide and caustic soda in a nickel crucible. For the sulphur, the ore was decomposed by a fusion, using sodium carbonate and zinc oxide in a porcelain dish. The silver was determined by a straight fire assay, making cupell and slag corrections, and using a pilot of pure silver to check the losses. My analysis of the sample showed it to contain:

Ag <sub>2</sub> O .....	19.35%
Fe <sub>2</sub> O <sub>3</sub> .....	41.77
SO <sub>3</sub> .....	27.09
SiO <sub>2</sub> .....	.60
PbO .....	1.60
Loss on heating at 150° C.....	8.20
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	98.61

This composition corresponds to the formula:



The theoretical composition would be:

Ag <sub>2</sub> O .....	20.35%
Fe <sub>2</sub> O <sub>3</sub> .....	43.06
SO <sub>3</sub> .....	28.11
H <sub>2</sub> O .....	9.48
	100.00

The name argento-jarosite is given on account of the similarity the new mineral bears to plumbo-jarosite.

When first found at the Tintic Standard mine it was supposed to be a form of cerargerite, but the absence of the halides was proved. Preliminary analysis showed that the mineral contained unvarying amounts of iron and sulphur. Its basic sulphate character is readily shown by its reluctance to go into solution in acids.

The theory of its origin is that silver sulphide has been dissolved in a solution of basic ferric sulphate, and the mineral was crystallized from the solution. Its occurrence is such as to confirm the opinion that it is secondary.

In the particular place where found, the silver mineral is of common occurrence. Pure masses have been taken out weighing more than a pound, being four by three inches by two and one-half inches. It has been the principal silver-bearing mineral in a relatively large tonnage of ore. In the months of February, March and April the aggregate of the shipments amounted to 200,000 oz. of silver. One carload of ore containing sixty-four tons assayed 1018 oz. per ton.

The ore body is entirely oxidized and contains but little iron in any form. A mineral similar in appearance, containing no silver, but high in lead values, is found nearby. It is only distinguishable by the difference in color, which is slightly more brown.

I wish to acknowledge the assistance of Mr. James Wade, assistant general manager of the Tintic Standard mine, at whose instigation it was that I determined the actual content of the mineral, and who is largely responsible for the description of the geological occurrence and origin. Acknowledgment is made of the suggestions of

Mr. Victor Heikes of the U. S. Geological Survey, who obtained specimens of the mineral from us and sent them to Dr. Schaller of the Survey, who confirms the writer's analysis.

As I am not equipped, nor do I feel myself competent to go into the optical properties of the mineral, Prof. Charles Palache of Harvard University has been asked to determine them, and his results will be published later in a forthcoming supplementary note.

Dividend, Utah.  
May 25, 1923.