

Sample of impure oxide of copper gave	Cu. per cent
By battery method	73.95
By new method	73.95
Another sample gave	
By battery method	73.99
By new method	73.98
A third sample gave	
By battery method	73.73
By new method	73.75
Three trials by the new method on another sample gave	{ 73.85 73.83 73.85
A sample of copper matte gave by new method	{ 46.90 46.89 46.90

Time, one and one-half hours in each case.

Many other examples might be given, but the above are considered sufficient.

The apparatus is manufactured by Messrs. Eimer & Amend, 205, 3d Avenue, New York City, N. Y.

*Notes on a Sulpho-Bismuthite*, BY E. LENEVE FOSTER.

Whilst in Mexico last summer my attention was directed to a mineral called by the Mexican miners *Pitanque*, and of which they designated two kinds; *Pitanque liso*, having a smooth appearance, and *Pitanque china*, having a crystalline appearance, which, however, is apparently due, not to a crystallization of the mineral, but to its cementing together small crystals of quartz. Upon careful examination I found this mineral to be a sulpho-bismuthite, very rich in silver; indeed, the principal silver mineral in the mine.

Upon more careful research since, I am led to the conclusion that it is a new variety of this class of mineral, of which several have been noticed of late years, and principally in the State of Colorado.

Of the already recognized minerals this one seems to most nearly resemble alaskaite, but it differs from that mineral in containing a much higher percentage of lead and silver, less bismuth, and no antimony. It occurs associated with quartz, iron pyrites and chalcopyrite, and has a whitish-gray color, with a strong metallic lustre. Its specific gravity

is 5.8 as obtained from four determinations, the highest being 5.96 and the lowest 5.62. Its hardness is 3 to 3.5, and it gives a black streak on porcelain.

B. B. in the open tube it gives fumes of sulphur dioxide. On charcoal an incrustation of lead oxide is obtained, and on continued blowing that for silver. With sulphur and iodide of potassium it gives the characteristic reaction for bismuth in a marked manner. By hydrochloric acid it is decomposed with precipitation of flocculent chloride of silver.

I am indebted to Mr. Geo. C. Tilden, of the State School of Mines, for the following analysis of this mineral.

Bismuth	34.51
Lead	21.51
Silver	13.47
Copper	2.32
Iron	0.87
Zinc	0.60
Silica	9.01
Sulphur	15.56
Moisture	0.76
	98.61

After deducting admixed quartz 9 per cent. chalcopryrite 3 per cent., sphalerite 1 per cent. and 0.76 moisture, a more correct basis will undoubtedly be obtained for arriving at the true composition of this mineral, which will then be :

Bismuth	40.13
Lead	25.12
Silver	15.66
Copper	1.63
Sulphur	16.58

from which I deduce the formula  $Pb_3Bi_5Ag_4S_{13}$ , corresponding to  $4Ag_2S, 6PbS, 5Bi_2S_3$ , the silver being sometimes partially replaced by copper. The exact locality in which I found this mineral was in the Sierra Madre Mountains, at the Loreto mine, Candameña, State of Chihuahua, Mexico.

Mr. Hillebrand remarked that reduced to its simplest general formula,  $2RS, BiS_3$ , this mineral corresponded to cosalite, a variety of which was described by him at the December meeting.