

ARSENOFERRITE FROM JACHYMOV,
CZECHOSLOVAKIA

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H. Baumhauer² has described small isometric crystals of a brown ferric arsenate from the Binnenthal in which the Fe:As ratio equaled 1:2. This mineral is believed to be pseudomorphous after an original arsenide of iron of the pyrite group to which he gave the name *arsenoferrite*. The mineral has not been found in its original unaltered state.

In the course of an examination of all available sulfides, one of us (M.N.S.) found a specimen of iron arsenide of distinctly isotropic character. This specimen (No. R-1063 of the Roebling collection, U. S. National Museum) came from the well known silver-nickel-cobalt-bismuth veins of Joachimsthal (now Jachymov) Czechoslovakia. Chemical investigation shows this mineral to be essentially an iron diarsenide with minor quantities of sulfur replacing arsenic and containing a small amount of copper. It therefore corresponds to the mineral described by Baumhauer and should be called *arsenoferrite*.

The Jachymov arsenoferrite occurs in the typical coarse cleavable white to pink carbonate gangue of this region. It forms irregular masses of very fine grain and rough conchoidal fracture. The color is a dull medium gray, less silvery than the gray of löllingite, but this variation is perhaps due to its fine grained nature. The luster is metallic to semi-metallic. There is no apparent cleavage present. The hardness is 5.5 and the specific gravity, determined with the pycnometer and corrected for the admixed carbonate shown in the analysis is 6.42.

The fresh massive mineral upon mineralographic examination proved to be exceptionally pure, no associated minerals other than veinlets of calcite being detected. This material was crushed and as much of the carbonates as possible removed by means of methylene iodide. The analysis, carried out by standard methods, gave the values given below.

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² *Zeit. Kryst.*, 51, 143-145, 1912.

ANALYSIS OF ARSENOFERRITE FROM JACHYMOV.

W. F. Foshag, Analyst.

| | | | |
|-------------------|-------|------|--------|
| Fe | 24.88 | .446 | } .467 |
| Cu | 1.34 | .027 | |
| Pb | 0.05 | .000 | |
| CaCO ₃ | 4.00 | | |
| MgCO ₃ | 1.57 | | |
| As | 66.84 | .891 | } .925 |
| S | 1.08 | .034 | |
| | 99.76 | | |

No cobalt or nickel could be detected. The analysis yields satisfactorily the ratios for FeAs₂ and the mineral is the arsenide member of the pyrite group.

The blowpipe characteristics are the same as for löllingite. Before the blowpipe it is infusible in the oxidizing flame, coloring the flame blue and giving off copious fumes with characteristic arsenic odor. Fusible in the reducing flame to a magnetic bead. In the open and closed tubes and on charcoal it gives the characteristic arsenic reactions. When examined under the reflecting microscope with polarized light the mineral is entirely isotropic in which it differs from löllingite, which is distinctly anisotropic. With HNO₃ it effervesces slowly, the surface staining brown. With FeCl₃ it stains brown. Negative reactions are obtained with HCl, KCN, KOH and HgCl₂. The mineral is undoubtedly an end member of the series (Co,Ni,Fe) As₂. The etch tests are practically identical with those of smaltite and the distinction can only be made by chemical tests.

The occurrence of isotropic iron diarsenide at Jachymov establishes arsenoferrite as a distinct species, differing from löllingite in its isotropic character. The absence of cobalt from this mineral, occurring as it does in ore deposits rich in cobalt minerals, is perhaps unusual but may be explained by the fact that two periods of mineralization have been recognized at Jachymov; an earlier one characterized by cobalt, nickel, bismuth and uranium associated for the most part with a siliceous gangue, and a later mineralization of chiefly silver in a carbonate gangue. While the relations of the arsenoferrite to these periods of mineralization is not now known it is possible that it belongs to the later period accompanying the silver.