

PHOSPHOSIDERITE FROM THE CHAMPION MINE, CALIFORNIA

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INTRODUCTION

Phosphosiderite, the monoclinic dimorph of $\text{FePO}_4 \cdot 2\text{H}_2\text{O}$, has been identified in samples collected from the Champion mine, Mono County, California. This is the first recorded occurrence of phosphosiderite from this mine, and possibly from California.

LOCATION

The Champion mine is located on the western slope of the White Mountains in eastern California at an elevation of 2800 meters and is well known for its rare phosphate minerals and rutile crystals. The mineralogy and geology of the mine has been described recently by Wise (1977).

During a recent trip to the mine, samples of a massive reddish brown mineral filling cavities in quartz were collected near the trail up to the Black Eagle camp. The massive quartz was not found in place but rather as part of the general float material resulting from earlier mining operations and general erosion. To date no other samples of this mineral have been found either along the slopes leading up to the main mining area or in place in the main deposit.

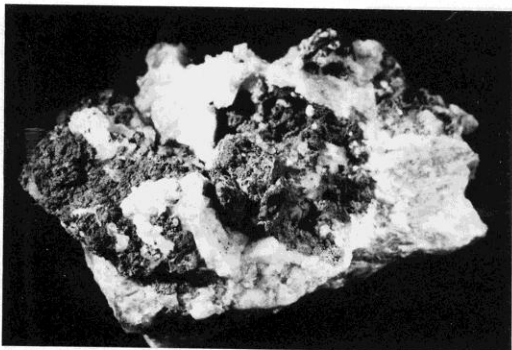


Figure 1. Typical sample of quartz containing reddish brown phosphosiderite. The specimen is 4 x 6 cm. G. Dunning photo and sample.

IDENTIFICATION

An energy dispersive X-ray analysis and X-ray diffraction pattern proved this mineral to be phosphosiderite. Strengite, the corresponding orthorhombic dimorph, has been identified earlier from the mine, notably in the upper workings at localities A and B of Wise (1977). Samples of massive, pale violet strengite have been found by the author as crusts on pyrophyllite in the talus rubble below the rutile area at locality E.

A macroscopic examination of the phosphosiderite revealed no

evidence of crystallization. Figure 1 illustrates a typical quartz sample containing the massive phosphosiderite. The botryoidal surface and porous nature suggests that the phosphosiderite did not originate as a direct replacement of a prior mineral in the host quartz, but rather it was deposited as a gel-like solution. Figure 2 illustrates the porous surface with scattered microcrystals of barite. The barite shows a branch-like network.

DISCUSSION

The formation of phosphosiderite and strengite was most likely by hydrothermal oxidation of pre-existing phosphate minerals, possibly members of the lazulite-scorzalite series, which are fairly abundant throughout the deposit. Phosphosiderite, for example, has been reported as pseudomorphs after lazulite at Graves Mountain, Georgia, by Barwood and Hajek (1979). Since both phosphosiderite and strengite have been found in very limited quantities, the conditions for their formation appear to have been limited and localized.



Figure 2. SEM enlargement showing delicate barite crystals covering surface of phosphosiderite. Field of view: 0.13 x 0.16 mm. G. Dunning photo and sample.

ACKNOWLEDGMENT

The author is indebted to William S. Wise for the X-ray diffraction and identification of phosphosiderite.

REFERENCES

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