PŮVODNÍ PRÁCE/ORIGINAL PAPER

Ni-Sb mineralizace z rudního revíru Michalovy Hory (Česká republika)

Ni-Sb mineralization from the Michalovy Hory ore district (Czech Republic)

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Abstract

An interesting hydrothermal Ni-Sb mineralization has been found in the dumps of the Jan Křtitel Gallery near Michalovy Hory, western Bohemia, Czech Republic. Breithauptite forms metallic fine-crystalline aggregates up to several cm in size with pinkish or reddish tint. It is hexagonal, space group $P6_3/mmc$ and its refined unit-cell parameters are: *a* 3.9251(2), *c* 5.1364(2) Å and *V* 68.531(7) Å^3. The chemical composition of breithauptite is close to ideal formula, only minor amounts of Bi (up to 0.02 *apfu*) and As (up to 0.12 *apfu*) were detected. Its empirical formula (mean of 45 point analyses) is $Ni_{0.97}(Sb_{0.97}As_{0.09})_{\Sigma 1.04}$. The most abundant arsenide in the studied association is nickeline, It occurs as metallic fine-crystalline aggregates up to several cm in size. Occasionally, nickeline aggregates weighing up to 1.5 kg were found. It shows chemical composition with Sb contents in the range 0.02 - 0.28 *apfu*. Rarely also microscopic aggregates of unusual Sb-rich nickeline (0.30 - 0.46 *apfu*) were observed together with breithauptite and rammelsbergite. Gersdorffite was found as microscopic aggregates in association with older rammelsbergite. Beside dominant Ni (0.47 - 0.68 *apfu*) it contains also Co (0.26 - 0.38 *apfu*) and Fe (0.07 - 0.17 *apfu*). Nickelskutterudite forms metallic light grey grains up to several cm in size, together with younger stephanite. Its chemical composition corresponds to the empirical formula $(Ni_{0.69}Fe_{0.27}Co_{0.03}Cu_{0.02})_{\Sigma 1.01}$ $(As_{2.93}S_{0.06}Sb_{0.01})_{\Sigma 3.00}$. Rammelsbergite appears in four associations: as rims of breithauptite or nickeline, as aggregates with relics of native bismuth or aggregates with rims of younger gersdorffite. Chemical composition of individual types of rammelsbergite varies especially in Ni/Co and As/Sb/S ratios. Millerite was found as metallic golden crystalline aggregates in fissures of breithauptite or rarely also as acicular crystals up to 2 mm in lenght. Its chemical composition can be expressed by the empirical formula $Ni_{1.00}(S_{0.99}Sb_{0.01})_{\Sigma 1.00}$. Violarite was observed as fillings of cavities up to 500 μm in size in breithauptite aggregates, its empirical formula is $Fe_{0.96}Ni_{2.03}(S_{3.98}Sb_{0.02}As_{0.01})_{\Sigma 4.01}$. Younger sulphidic mineralization is represented by aggregates of tetrahedrite (empirical formula $(Cu_{9.78}Ag_{0.22})_{\Sigma 10.00}(Fe_{1.31}Zn_{0.51}Co_{0.04})_{\Sigma 1.86}$ $(Sb_{3.92}As_{0.52})_{\Sigma 4.44}S_{12.70}$) and microscopis aggregates of galena $(Pb_{0.95}Cu_{0.08})_{\Sigma 1.03}$ $S_{0.98}$ and stephanite $(Ag_{5.04}Cd_{0.01})_{\Sigma 5.05}(Sb_{0.90}As_{0.13})_{\Sigma 1.03}S_{3.93}$. The crystallization sequence of studied mineral phases is following: breithauptite, nickeline, bismuth → Sb-rich nickeline → rammelsbergite → gersdorffite→ nickelskutterudite → millerite, violarite, tetrahedrite → stephanite, galena.

Key words: breithauptite, millerite, violarite, powder X-ray diffraction data, unit-cell parameters, chemical composition, Michalovy Hory, Czech Republic

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