

Nové údaje o supergenných mineráloch z polymetalického ložiska Čavoj, Strážovské vrchy (Slovenská republika)

New data on supergene minerals from the Čavoj base metal deposit, Strážovské vrchy Mts. (Slovak Republic)

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Abstract

An interesting association of supergene minerals represented by anglesite, aragonite, brianyoungite, cerussite, gypsum, hemimorphite, malachite, mimetite, pyromorphite and wulfenite was found at the Čavoj base metal deposit, Strážovské vrchy Mts., Slovak Republic. Brianyoungite occurs as white crystalline coatings and irregular to spherical aggregates, which consist of thin-tabular crystals up to 0.1 mm in size. It was found together with aragonite and gypsum on the surface of ore fragments at the dumps of Geschenk and Ferdinand shaft. The refined unit-cell parameters of brianyoungite from the powder X-ray data are: a 15.710(8) Å, b 6.273(7) Å, c 5.45(1) Å, V = 537(1) Å³. Cerussite is the most abundant supergene phase. It forms well developed colourless to white tabular or prismatic crystals up to 5 mm in size, associated together with anglesite, mimetite, pyromorphite and wulfenite. Its refined unit-cell parameters are: a 5.189(1) Å, b 8.507(2) Å, c 6.152(1) Å, V 271.56(9) Å³. Hemimorphite was identified at the dumps situated near Strieborná adit as white hemispherical crystalline aggregates up to 2 mm in the fissures of sphalerite-rich gangue. It is orthorhombic, space group *Imm2* and the unit-cell parameters refined from X-ray powder diffraction data are: a 8.3634(8) Å, b 10.711(1) Å, c 5.1134(5) Å, and V 458.07(8) Å³. Mimetite is rare mineral and it occurs only at the Baniská area. It forms bright yellow to yellowish-green crystalline aggregates and crusts, which are composed by prismatic crystals up to 1 mm in size. Its unit-cell parameters refined from powder X-ray data are: a 10.236(10) Å, c 7.4126(9) Å and V 673(1) Å³. Mimetite from the Čavoj deposit contain only minor amounts of Ca (up to 0.33 *apfu*) and P (up to 0.39 *apfu*) with the empirical formula (average of 6 point analyses) corresponding to $(\text{Pb}_{5.11}\text{Ca}_{0.21})_{\Sigma 5.32}[(\text{AsO}_4)_{2.77}(\text{PO}_4)_{0.23}]_{\Sigma 3.00}\text{Cl}_{1.17}$ on the basis of $\text{P}+\text{As}+\text{V}+\text{Si}+\text{S}=3$ *apfu*. Pyromorphite was identified in several samples from the Ferdinand shaft dump as pale-green to pale-yellow prismatic crystals up to 2 mm in size, which are often grouped to the crystalline crusts and aggregates together with cerussite and wulfenite. The refined unit-cell parameters of pyromorphite are: a 9.986(8) Å, c 7.3528(3) Å and V 635.0(5) Å³. Only minor amounts of Ca (up to 0.19 *apfu*) and As (0.07 *apfu*) were detected in studied samples of pyromorphite and its empirical formula (average of 9 point analyses) is corresponding to $(\text{Pb}_{4.97}\text{Ca}_{0.10})_{\Sigma 5.07}[(\text{PO}_4)_{2.95}(\text{AsO}_4)_{0.05}]_{\Sigma 3.00}\text{Cl}_{1.15}$ on the basis of $\text{P}+\text{As}+\text{V}+\text{Si}+\text{S}=3$ *apfu*. Wulfenite is rare supergene phase at the studied locality (dump of Ferdinand shaft) and it occurs as well developed, orange pyramidal crystals up to 1 mm in size together with cerussite and pyromorphite. It is tetragonal, space group *I4₁/a* and its unit-cell parameters refined from X-ray powder diffraction data are: a 5.435(1) Å, c 12.1065(2) Å and V 357.59(9) Å³. Its chemical composition is close to the end member formula with only insignificant amounts of P and As (both up to 0.01 *apfu*) and empirical formula (average of 5 point analyses) corresponding to $\text{Pb}_{1.00}[(\text{MoO}_4)_{0.98}(\text{AsO}_4)_{0.01}(\text{PO}_4)_{0.01}]_{\Sigma 1.00}$ on the basis of $\text{Mo}+\text{W}+\text{As}+\text{P}=1$ *apfu*. On the basis of detailed paragenetic study two principal associations of supergene minerals were distinguished at the Čavoj deposit: a) supergene phases (e.g. cerussite, hemimorphite, mimetite, pyromorphite or wulfenite) formed by *in-situ* decomposition of primary ore minerals in the supergene zone or b) supergene minerals of sub-recent origin, which were formed by the weathering of ore fragments in dump environment (e.g. aragonite, brianyoungite and gypsum).

Key words: supergene minerals, brianyoungite, cerussite, hemimorphite, mimetite, pyromorphite, wulfenite, X-ray powder data, chemical composition, Čavoj, Strážovské vrchy Mts., Slovak Republic

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