

# Supergenní Cu-Zn karbonáty z rudního ložiska Horní Rokytnice v Krkonoších

Supergene Cu-Zn carbonates from the ore deposit Horní Rokytnice, the Krkonoše Mts., Czech Republic

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## Abstract

Rare supergene Cu-Zn carbonates, aurichalcite and rosasite, were found in 2007 in remnants of mine dumps of abandoned ore deposit at slope of the Sachrův hřbet hill above Horní Rokytnice (part of Rokytnice nad Jizerou), western Krkonoše Mountains, northern Bohemia, Czech Republic. Aurichalcite forms translucent crystalline aggregates up to 1 cm in size with markedly sky-blue surface. Its elongated and thinly tabular crystals up to 1.5 mm in length are very brittle with a perfect cleavage and distinct pearly luster. They are transparent and colourless with light bluish tint. Aurichalcite is monoclinic, space group  $P2_1/m$ , the unit-cell parameters refined from X-ray powder data are:  $a = 13.812(1)$ ,  $b = 6.4041(8)$ ,  $c = 5.3060(8)$  Å,  $\beta = 100.71(1)^\circ$ ,  $V = 461.14(9)$  Å<sup>3</sup>. Chemical analyses yielded the average composition CaO 0.01, FeO 0.05, PbO 0.74, CuO 15.90, MnO 0.02, ZnO 51.61, Sb<sub>2</sub>O<sub>3</sub> 0.04, CO<sub>2</sub> (14.69), SiO<sub>2</sub> 0.06, As<sub>2</sub>O<sub>5</sub> 0.06, SO<sub>3</sub> 0.11, H<sub>2</sub>O (9.02), total (92.32) wt. %, corresponding to the formula  $(Zn_{3.78}Cu_{1.19}Pb_{0.02})_{\Sigma 4.99}[(CO_3)_{1.99}(SO_4)_{0.01}]_{\Sigma 2.00}(OH)_{5.97}$  on the basis of 5 atoms in cation sites. Rosasite forms thin, irregular coatings up to 1 mm<sup>2</sup> on aurichalcite and rarely hemispherical aggregates up to 0.3 mm in size. It is translucent to opaque with indistinct greyish green colour and pearly luster. Surface of its aggregates are usually smooth, its columnar crystals up to 10 µm were observed only rarely. The average results of five chemical analyses are: CaO 0.02, FeO 0.03, PbO 0.38, CuO 39.01, MnO 0.01, ZnO 22.77, CO<sub>2</sub> (16.90), SiO<sub>2</sub> 0.06, As<sub>2</sub>O<sub>5</sub> 0.03, P<sub>2</sub>O<sub>5</sub> 0.11, SO<sub>3</sub> 0.04, H<sub>2</sub>O (6.90), total (86.26) wt. % corresponding to  $(Cu_{1.27}Zn_{0.72})_{\Sigma 1.99}(CO_3)_{0.99}(OH)_{1.99}$  on the basis of 2 atoms in cation sites. Chemical composition of both studied Cu-Zn carbonates is compared with published data. The succession of origin of supergene minerals inferred from the samples studied is as follows: hemimorphite → aurichalcite → rosasite.

**Key words:** aurichalcite, rosasite, supergene minerals, X-ray powder data, unit-cell parameters, chemical composition, Horní Rokytnice, Czech Republic