

Uranová supergenní mineralizace s fosfuranylitem z Abertam, Krušné hory (Česká republika)

Uranium supergene mineralization from Abertamy, Krušné hory Mountains (Czech Republic)

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Abstract

An uranium supergene mineralization (phosphuranylite, metatorbernite, metaautunite) was found in the dump material of the historical mine at the Graf Mauritius vein near Abertamy (Krušné hory Mountains, Czech Republic). Phosphuranylite occurs there as yellow aggregates up to several cm in size composed by tiny tabular crystals (0.1 - 0.2 mm). It is orthorhombic, space group *Cmcm*, the unit-cell parameters refined from X-ray powder diffraction data are: a 15.893(6), b 13.738(5), c 17.302(7) Å, V 3777.6(4) Å³. Chemical analyses of phosphuranylite correspond to the empirical formula $K_{1.01}Ca_{0.99}Pb_{0.08}Al_{0.06}Co_{0.05}Ni_{0.02}Mn_{0.02}Zn_{0.01}(H_3O)_{2.49}(UO_2)_{6.98}O_4[(PO_4)_{3.95}(AsO_4)_{0.05}]_{\Sigma 4.00} \cdot 8H_2O$. Metaautunite forms light greenish yellow tabular crystals up to 1 mm in size. It is tetragonal, space group *P4/n*, the unit-cell parameters refined from X-ray powder diffraction data are: a 6.969(4), c 16.8885(2) Å and V 820.3(5) Å³. Chemical analyses of metaautunite correspond to the empirical formula $(Ca_{0.89}Cu_{0.05}Co_{0.02}Fe_{0.01}Ba_{0.01})_{\Sigma 0.98}(UO_2)_{1.96}[(PO_4)_{1.93}(AsO_4)_{0.07}]_{\Sigma 2.00} \cdot 6H_2O$. Metatorbernite forms green crystalline coatings composed of tabular, and more rarely pyramidal crystals up to 1 mm in size. It is tetragonal, space group *P4/n*, the unit-cell parameters refined from X-ray powder diffraction data are: a 6.973(2), c 17.3263(2) Å and V 842.5(3) Å³. Chemical analyses of metatorbernite correspond to the empirical formula $(Cu_{0.93}Ca_{0.01}Zn_{0.01}Fe_{0.01})_{\Sigma 0.96}(UO_2)_{1.98}[(PO_4)_{1.89}(AsO_4)_{0.10}(VO_4)_{0.01}]_{\Sigma 2.00} \cdot 8H_2O$. The origin of studied mineral association is interpreted as a product of *in-situ* supergene alteration of primary uranium mineralization in the environment localized nearby the present surface.

Key words: phosphuranylite, metatorbernite, metaautunite, X-ray powder data, chemical composition, uranium deposit, Abertamy, the Krušné hory Mts., Czech Republic

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