

Neobvyklá asociace supergenních minerálů uranu ze žíly Jan Evangelista, Jáchymov (Česká republika)

Unusual association of supergene uranium minerals from the Jan Evangelista vein, Jáchymov (Czech Republic)

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Abstract

An unusual association of supergene uranium minerals was found at old abandoned mine working at area of the Jan Evangelista vein, Daniel level of mine Svornost, central part of the Jáchymov ore district, Krušné hory Mountains, Czech Republic. Sklodowskite occurs there as rich whitish yellow fine crystalline aggregates at area up to 2 x 3 cm of strongly supergene altered gangue formed by tiny acicular crystals up to 10 µm in length. It is monoclinic, space group *C2/m*; the unit-cell parameters refined from X-ray powder diffraction data are: *a* 17.36(1), *b* 7.054(4), *c* 6.619(5) Å, β 105.79(7)° and *V* 780(1) Å³; its chemical analyses correspond to the empirical formula $(\text{Mg}_{0.92}\text{Fe}_{0.01}\text{Ni}_{0.01}\text{Cu}_{0.01}\text{Co}_{0.01}\text{Ca}_{0.01})_{\Sigma 0.97}(\text{UO}_2)_2(\text{SiO}_3\text{OH})_{2.01}(\text{SO}_4)_{0.04}(\text{PO}_4)_{0.02}(\text{AsO}_4)_{0.01} \cdot 6\text{H}_2\text{O}$ on the basis 2 *apfu* U. Compreignacite forms yellow irregular aggregates up to 3 mm in size at area up to 1 x 1 cm of altered gangue with rare prismatic crystals up to 20 µm. It is orthorhombic, space group *Pnmm*; the unit-cell parameters refined from X-ray powder diffraction data are: *a* 14.847(2), *b* 7.212(1), *c* 12.151(4) Å, and *V* 1301.1(3) Å³; its chemical analyses correspond to the empirical formula $(\text{K}_{1.07}\text{Na}_{0.05}\text{Pb}_{0.04}\text{Mg}_{0.03}\text{Cu}_{0.02}\text{Ni}_{0.02}\text{Al}_{0.02})_{\Sigma 1.25}[(\text{UO}_2)_6\text{O}_4(\text{SiO}_4)_{0.08}(\text{OH})_{5.16}] \cdot 7\text{H}_2\text{O}$ on the basis 6 *apfu* U. Two chemically different types of fourmarierite were found. Pb-deficient and K-rich fourmarierite F1 forms dark yellowish orange to orange fine crystalline aggregates up to 2 mm in size with tiny tabular crystals up to 20 µm. It is orthorhombic, space group *Bb2₁m*, the unit-cell parameters refined from X-ray powder diffraction data are: *a* 14.025(2), *b* 16.469(3), *c* 14.623(2) Å, and *V* 3378(2) Å³; its chemical analyses are given in the tables. Fourmarierite F2 is more rare, it occurs as orange red or orange brown aggregates in association with compreignacite. It is orthorhombic, space group *Bb2₁m*, the unit-cell parameters refined from X-ray powder diffraction data are: *a* 13.442(5), *b* 16.611(6), *c* 14.447(2) Å, and *V* 3226(1) Å³; its chemical analyses are given in the tables. Unnamed „Na-metaschoepite“ forms pale yellowish orange powdery or fine crystalline aggregates up to 3 mm in size in association with compreignacite, fourmarierite and gypsum. It is orthorhombic, space group *Pbcn*, the unit-cell parameters refined from X-ray powder diffraction data are: *a* 14.025(2), *b* 16.469(3), *c* 14.623(2) Å, and *V* 3378(2) Å³; its chemical analyses correspond to the empirical formula $(\text{Na}_{0.30}\text{Cu}_{0.13}\text{Al}_{0.13}\text{K}_{0.08}\text{Pb}_{0.07}\text{Ca}_{0.06}\text{Mg}_{0.06}\text{Mn}_{0.02}\text{Zn}_{0.02}\text{Fe}_{0.02}\text{Ni}_{0.01}\text{Co}_{0.01})_{\Sigma 0.91}[(\text{UO}_2)_4\text{O}_2(\text{SiO}_4)_{0.26}(\text{SO}_4)_{0.02}(\text{OH})_{4.46}] \cdot 5\text{H}_2\text{O}$ on the basis of 4 *apfu* U. The origin of described mineral association is interpreted as product of (sub)recent weathering of primary uraninite in neutral or only weak-acidic conditions.

Key words: *sklodowskite, compreignacite, fourmarierite, unnamed Na-metaschoepite, powder X-ray diffraction data, unit-cell parameters, chemical composition, the Jáchymov ore district, Czech Republic*

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