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Paratacamit z jáchymovského rudního revíru (Česká republika) a jeho asociace

Paratacamite from the Jáchymov ore district (Czech Republic) and its association

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Abstract

An interesting mineral association of paratacamite, nantokite, cuprite and an unnamed NaCuCl-arsenate was found at sample from the Jáchymov ore district (probably 12th level of the Geschieber vein, Svornost mine), Krušné hory Mountains, Czech Republic. Paratacamite occurs as light greenish-blue to whitish green irregular aggregates up to 2 mm in size. It is trigonal, space group *R-3,* the unit-cell parameters refined from X-ray powder diffraction data are: *a* 13.656(8), *c* 14.042(11) Å and *V* 2268(2) Å^3; its chemical analyses correspond to the empirical formula $Cu_{3.00}(Cu_{0.56}Ni_{0.38}Co_{0.03}Ca_{0.03})_{\Sigma 1.00}Cl_{1.91}(OH)_{6.09}$ on the basis of 4 cations *apfu*. Nantokite forms aggregates up to 200 μm in size replacing earlier native copper. It is cubic, space group *F*-43*m*, the unit-cell parameter refined from X-ray powder diffraction data are: *a* 5.4164(12) Å and *V* 158.90(11) Å^3; its chemical analyses correspond to the empirical formula $Cu_{1.00}Cl_{1.00}$ on the base of 2 *apfu*. Cuprite was identified only by X-ray powder diffraction data, it is cubic, space group *Pn*3*m* with unit-cell parameter *a* 4.2736(4) Å and *V* 78.08(2) Å^3. An unnamed NaCuCl-arsenate occurs as lavendulane-like blue crusts with an area of up to 5 × 8 mm on altered rock or earlier paratacamite. The crusts are composed of hemispherical aggregates up to 0.2 mm in size with a very finely crystalline surface. Its X-ray powder diffraction pattern (*d*(Å)/I_{obs}: 12.808/100, 4.944/25, 3.114/16, 2.738/17, 2.516/20) does not correspond to any approved mineral species. The chemical composition of NaCuCl-arsenate is close to ideal formula $NaCu_5(AsO_4)_2(AsO_3OH)_2Cl{\cdot}3H_2O$ and its empirical formula based on As+P+Si+S = 4 *apfu* is $Na_{1.07}Ca_{0.24}(Cu_{4.70}Ni_{0.27}Co_{0.02}Zn_{0.01}Mn_{0.01})_{\Sigma 5.01}(AsO_4)_{2.00}[(AsO_3OH)_{1.73}(AsO_4)_{0.13}(SiO_4)_{0.08}(SO_4)_{0.04}(PO_4)_{0.02}]_{\Sigma 2.00}Cl_{1.26}{\cdot}3H_2O$. The origin of the described mineral association is connected with (sub)recent weathering of native copper in quartz veinlets in altered granite rocks.

Key words: *paratacamite, nantokite, unnamed $NaCu_5(AsO_4)_2(AsO_3OH)_2Cl{\cdot}3H_2O$, supergene mineralization, X-ray powder data, unit-cell parameters, chemical composition, Jáchymov ore district, Czech Republic*

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