PŮVODNÍ PRÁCE/ORIGINAL PAPER

Bendadaite from Krásno near Horní Slavkov (Czech Republic), description and Raman spectroscopy

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Sejkora J, Tvrdý J, Čejka J, Vrtiška L, Dolníček Z (2019) Bendadaite from Krásno near Horní Slavkov (Czech Republic), description and Raman spectroscopy. Bull Mineral Petrolog 27(1): 63-71 ISSN 2570-7337

Abstract

A rare Fe^{2+}-Fe^{3+} dominant arsenate of the arthurite group, bendadaite, was determined at two samples from an abandoned Huber open pit in the Krásno ore district near Horní Slavkov, Slavkovský les area (Czech Republic). Bendadaite occurs there as brownish to olive green crystalline aggregates up to 2 - 6 mm in size in cavities of quartz gangue. The aggregates are composed by elongate prismatic crystals up to 100 - 200 μm in length, partly in radial arrangement. It is opaque to semi-translucent (aggregates) to translucent (thin fragments). It has vitreous to subadamantine (crystals) or greasy to dull (aggregates) lustre. Bendadaite is monoclinic, space group $P2_1/c$, with the unit-cell parameters refined from X-ray powder diffraction data: *a* 10.183(2), *b* 9.672(2), *c* 5.536(1) Å, *β* 94.15(2)°, *V* 543.8(1) Å^3 (sample NM) and *a* 10.175(2), *b* 9.682(2), *c* 5.532(1) Å, *β* 94.13(2)°, *V* 543.6(1) Å^3 (sample JT). The chemical composition of bendadaite agrees with general stoichiometry of the arthurite group minerals and corresponds to the following empirical formulae: $(Fe_{0.52}Zn_{0.25}Cu_{0.02}Mg_{0.02}\square_{0.19})_{\Sigma 1.00}(Fe^{3+}_{1.80}Al_{0.20})_{\Sigma 2.00}[(AsO_4)_{1.66}(PO_4)_{0.34}]_{\Sigma 2.00}(OH)_2 \cdot 4H_2O$ (sample NM) and $(Fe_{0.63}Zn_{0.26}\square_{0.11})_{\Sigma 1.00}(Fe^{3+}_{1.87}Al_{0.13})_{\Sigma 2.00}[(AsO_4)_{1.62}(PO_4)_{0.38}]_{\Sigma 2.00}(OH)_2 \cdot 4H_2O$ (sample JT). The Raman spectra of both studied bendadaite samples as well as tentative assignment of observed bands are given in this paper. Origin of bendadaite from Krásno is connected to *in-situ* supergene weathering of primary arsenopyrite, sphalerite and phosphates and high activity of arsenate and Fe^{2+}, Fe^{3+} ions in acidic supergene fluids.

Key words: *bendadaite, arthurite group, powder X-ray diffraction data, unit-cell parameters, chemical composition, Raman spectroscopy, Krásno near Horní Slavkov, Czech Republic*

Obdrženo 18. 3. 2019; přijato 14. 6. 2019