

Nordstrandit z lomu v Děpoltovicích u Karlových Varů (Česká republika)

Nordstrandite from the Děpoltovice quarry near Karlovy Vary (Czech Republic)

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Abstract

The rich occurrence of well-crystalline rare Al-hydroxide, nordstrandite, was found in the Děpoltovice quarry near Karlovy Vary, western Bohemia (Czech Republic). It forms there several morphological types and in the studied association, gibbsite was not found. This is atypical in comparison with other similar localities. Nordstrandite is triclinic, space group *P*-1 with following unit-cell parameters: $a = 6.131(6)$ Å, $b = 6.946(6)$ Å, $c = 5.063(5)$ Å, $\alpha = 95.86(7)^\circ$, $\beta = 99.05(7)^\circ$, $\gamma = 83.26(8)^\circ$, $V = 210.7(2)$ Å³. Chemical analyses yielded the average composition Na₂O 0.06, CaO 0.04, MgO 0.08, Al₂O₃ 67.57, SiO₂ 0.62, H₂O_{calc.} 36.22, total 104.59 wt. % corresponding to the formula (Al_{0.99}Si_{0.01})_{Σ1.00}(OH)₃ on the basis of 1 atom in cation sites. Nordstrandite was found in the close association of gonnardite and böhmite. Böhmite is orthorhombic, space group *Cmcm* with following unit-cell parameters: $a = 2.82(3)$, $b = 12.17(6)$, $c = 3.71(2)$ Å, $V = 127(2)$ Å³ and its average chemical composition CaO 0.28, MgO 0.09, Al₂O₃ 78.55, SiO₂ 0.80, H₂O_{calc.} 14.06, total 93.77 wt. % corresponding to the formula (Al_{0.99}Si_{0.01})_{Σ1.00}O(OH) on the basis of 1 atom in cation sites. Gonnardite is tetragonal, space group *I*-42*d* with following unit-cell parameters: $a = 13.226(3)$, $c = 6.619(3)$, $V = 1157.8(3)$ and its average chemical composition Na₂O 10.83, CaO 5.49, SrO 0.22, Al₂O₃ 29.48, SiO₂ 40.64, H₂O_{calc.} 13.48, total 100.15 wt. % corresponding to the formula (Na_{5.60}Ca_{1.57}Sr_{0.03})_{Σ7.20}[(Al_{9.27}Si_{10.84})_{Σ20.11}O₄₀] · 12H₂O on the basis 40 O. The origin of studied mineral association represented by calcite, gonnardite → nordstrandite → böhmite is interpreted as a product of precipitation from alkaline solutions with high alkali (Ca, Na) concentrations.

Key words: nordstrandite, gonnardite, böhmite, alkaline neovulkanic rocks, nephelinite, Děpoltovice near Karlovy Vary, Czech Republic