Slavkovit from Preisselberg, the Krupka ore district (Czech Republic) and its mineral association

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Abstract

A unique supergene mineral association was found at abandoned Gallery No. 3 Preisselberg, the Krupka ore district, Krusňane hory Mountains, Czech Republic. Slavkovite forms there light pale blue to blue-green rosettes up to 1 mm across composed by lath-like crystals; it is translucent (in aggregates) to transparent (in crystals), very brittle, and has a vitreous luster and perfect cleavage. Its chemical analyses correspond to the empirical formula (Cu6.07Al0.95Fe0.07)(AsO4)3.74(SO4)0.26[(PO4)0.032(OH)1.06]·23H2O on the basis As+P = 10 apfu. Olivinite was found as relatively abundant dark olive green hemispherical to spherical aggregates up to several cm in size. It is orthorhombic, space group Pnnm, the unit-cell parameters refined from X-ray powder diffraction data are: a 6.016(1), b 13.133(1), c 9.855(1) Å; its chemical analyses correspond to the empirical formula (Cu6.07Al0.95Fe0.07)(AsO4)3.74(SO4)0.26[(PO4)0.032(OH)1.06]·23H2O on the basis As+P = 1 apfu. Abundant strashimirite occurs there as greenish white coatings on the area to several cm², its light green crystalline aggregates up to 0.5 mm in size consisting of acicular crystals are more rare. Strashimirite is probably monoclinic, space group P21/a, the unit-cell parameters refined from X-ray powder diffraction data are: a 9.569(6), b 18.59(1), c 6.016(1) Å; its chemical analyses correspond to the empirical formula (Cu6.07Al0.95Fe0.07)(AsO4)3.74(SO4)0.26[(PO4)0.032(OH)1.06]·23H2O on the basis As+P = 1 apfu. Brochantite forms there abundant dark green fine crystalline coatings on the area up to several cm² in size and rarely also dark green tiny (up to 0.5 mm) prismatic crystals. It is monoclinic, space group P21/c, the unit-cell parameters refined from X-ray powder diffraction data are: a 13.133(1), b 9.855(1), c 6.016(1) Å; its chemical analyses correspond to the empirical formula (Cu6.07Al0.95Fe0.07)(AsO4)3.74(SO4)0.26[(PO4)0.032(OH)1.06]·23H2O on the basis S+As+P = 4 apfu. Devilline was found as relatively abundant whitish fine crystalline coatings on the area up to 1 x 1 cm in size; light bluish green aggregates up to 0.5 cm across or rarely also transparent tabular crystals up to 0.2 mm across. Devilline is monoclinic, space group P21/c, the unit-cell parameters refined from X-ray powder diffraction data are: a 20.86(1), b 6.195(3), c 21.96(1) Å; its chemical analyses correspond to the empirical formula Ca0.99Al0.03(AsO4)3.74(SO4)0.26[(PO4)0.032(OH)1.06]·23H2O on the basis S+As+P = 4 apfu. Abundant olivenite occurs there as abundant greenish white coatings on the area to several cm², its light green crystalline aggregates up to 0.5 mm across; its chemical analyses correspond to the empirical formula (Cu6.07Al0.95Fe0.07)(AsO4)3.74(SO4)0.26[(PO4)0.032(OH)1.06]·23H2O on the basis As+P = 1 apfu. Abundant olivenite occurs there as abundant greenish white coatings on the area to several cm², its light green crystalline aggregates up to 0.5 mm across; its chemical analyses correspond to the empirical formula (Cu6.07Al0.95Fe0.07)(AsO4)3.74(SO4)0.26[(PO4)0.032(OH)1.06]·23H2O on the basis As+P = 1 apfu.

Key words: slavkovite, olivenite, strashimirite, new mineral phases, powder X-ray diffraction data, unit-cell parameters, chemical composition, the Krupka ore district, Czech Republic.