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Olivenite and cornwallite from the Podlipa copper deposit near Ľubietová, Slovakia

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Abstract

An interesting occurrence of olivenite and cornwallite was recently discovered in cavities of quartz at the Podlipa copper deposit near Ľubietová, Slovakia. Olivenite occurs as olive to pale green sprays or radial aggregates consisting of individual acicular crystals up to 5 mm long. Its refined unit-cell parameters (for the monoclinic space group $P2_1/n$) are: a 8.6192(13) Å, b 8.2300(11) Å, c 5.9349(8) Å, α 90.055(12)° and V 420.99(7) Å^3. Studied olivenite shows intense chemical zoning caused by strong variation of As and P contents. Most of the zones are corresponding to olivenite (with P content ranging between 0.02 to 0.39 *apfu*), but darker zones or domains of As-rich libethenite (with As content ranging between 0.18 to 0.24 *apfu*) were occasionally observed. Cornwallite forms dark green massive fillings between olivenite crystals or microcrystalline botryoidal crusts. The refined unit-cell parameters (for the monoclinic space group $P2_1/c$) of botryoidal cornwallite from the Podlipa deposit are: a 4.6112(2) Å, b 5.7698(3) Å, c 17.4167(11) Å, β 92.009(5)° and V 463.10(3) Å^3. The two compositional types of cornwallite were distinguished. The first type is represented by relatively homogenous aggregates with only minor contents of P (from 0.04 to 0.22 *apfu*). The second type occurs as polycrystalline fillings with strong chemical zoning and has much more significant variation of As and P contents, representing solid-solution series between P-rich cornwallite (with 1.41 *apfu* of As and 0.59 *apfu* of P) and As-rich pseudomalachite (with 1.37 *apfu* of P and 0.63 *apfu* of As).

Key words: *olivenite, cornwallite-pseudomalachite series, supergene minerals, X-ray powder data, chemical composition, Podlipa deposit, Ľubietová, Slovakia*

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