

Poppiite, the V³⁺ end-member of the pumpellyite group: Description and crystal structure

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ABSTRACT

Poppiite, a new mineral from Gambatesa mine (Val Graveglia, Genova, Northern Italy), is the V³⁺ end-member of the pumpellyite group [^{IVIII}(Ca_{7.68}Na_{0.27}K_{0.03}Rb_{0.02})_{Σ8.00}^{IVII}(V³⁺_{1.26}Fe³⁺_{1.02}Mg_{0.78}Mn²⁺_{0.59}Al_{0.31}Cu²⁺_{0.04})_{Σ4.00}^{IVII}(V³⁺_{6.89}Al_{1.07}Ti_{0.04})_{Σ8.00}^{IVII}(Si_{11.69}Al_{0.31})_{Σ12.00}O₄₂(OH)₁₄; *C*2/*m*, *a* = 19.2889(6), *b* = 6.0444(2), *c* = 8.8783(3) Å, β = 97.328(2)°, *V* = 1026.66(6) Å³, *D*_{meas} = 3.36(2) g/cm³, and *D*_{calc} = 3.44 g/cm³]. Poppiite crystals, with size varying from 0.1 to 0.6 mm, are minute, greenish-brown, and prismatic, and are associated with roscoelite, ganophyllite, manganaxinite, goldmanite, and calcite.

The strongest lines in the X-ray powder diffraction pattern [*d*_{obs} (Å), *I*_{rel.}, (*hkl*)] are: 2.930, 100, (511); 3.817, 70, (202); 2.548, 65, ($\bar{3}13$); 2.551, 62, (420); 1.612, 57, ($\bar{7}31,424$); and 2.367, 51, (222, 403). Poppiite is optically negative, with 2*V*_{calc} = 44°, *n*_α = 1.768(9), *n*_β 1.804(8), *n*_γ 1.810(9). The pleochroic scheme is α = light yellowish brown, β = deep greenish brown, and γ = brown to reddish brown. The crystal structure was refined using 1918 unique reflections to *R* = 0.0307. Like the other pumpellyite-group minerals the crystal structure of poppiite consists of chains of edge-sharing octahedra linked by SiO₄, Si₂O₇, and CaO₇ polyhedra.

Keywords: New mineral, analysis chemical (mineral), crystal structure, optical properties, XRD data