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Pertsevite-(OH), a new mineral in the pertsevite series, $Mg_2(BO_3)_{1-x}(SiO_4)_x(F,OH)_{1-x}$ (x < 0.5), from the Snezhnoye deposit in Sakha-Yakutia Republic, Russia

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Abstract

Pertsevite-(OH), end-member formula $Mg_2(BO_3)(OH)$, is a new mineral found in a ludwigite-kotoite magnesian skarn from the Snezhnoye deposit in Sakha-Yakutia Republic, Russia. The Commission on New Minerals, Nomenclature and Classification, IMA (IMA 2008-060) has approved the mineral and the mineral name. Moreover, the Chairman of the CNMNC agreed to renaming pertsevite to pertsevite-(F). The two minerals constitute the pertsevite series with the general formula $Mg_2(BO_3)_{1-x}(SiO_4)_x(OH,F)_{1-x}$, where x = 0.1–0.3. Pertsevite-(OH) is biaxial: $2V_z$ = 55–65°(meas), $2V_z$ = 75°(calc); α = 1.611(1), β = 1.623(1), γ = 1.644(1)°; $X = b$, $Y = c$, $Z = a$. It is associated with kotoite, szaibelyite, ludwigite-azoproite, clinohumite, hydroxylclinohumite, forsterite, chondrodite, calcite, REE-bearing sakhaite, sphalerite, and goethite. Ion microprobe analyses of pertsevite-(OH) using secondary ion mass spectrometry gave B, F, and H contents consistent with B and F contents determined by electron microprobe analyses (EMPA), and with OH contents calculated from EMPA data, confirming that OH/F ratio > 1 in pertsevite-(OH). Pertsevite-(OH) is orthorhombic, with space group *Pnma*. Cell dimensions refined from X-ray powder diffraction data are as follows: a = 20.499(1), b = 11.900(1), c = 4.589(1) Å, and V = 1119.4(3) Å^3. The strongest lines of the X-ray diffraction pattern are [(*hkl*), *d*-spacing in Å, (*I*)]: (331) 2.7480 (61), (141) 2.4788 (42), (711) 2.4197 (35), (441) 2.2455 (86), (801) 2.2408 (45), (442) 1.7124 (100), (802) 1.7074 (47), and (12.4.0) 1.4817 (51). The main bands in the FTIR spectrum of pertsevite-(OH) are 1354, 1261, 1178, 1022, 975, 929, 888, 745, 555 and OH-specific 3696, 3562, 3530 cm^{-1}.

Keywords: Pertsevite-(OH), pertsevite-(F), pertsevite series, SIMS, FTIR, Snezhnoye deposit, Sakha-Yakutia Republic, Russia