American Mineralogist, Volume 93, pages 1545–1549, 2008

Herderite from Mogok, Myanmar, and comparison with hydroxyl-herderite from Ehrenfriedersdorf, Germany

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Abstract

The crystal structures of herderite, $CaBePO_4[F_{0.75}(OH)_{0.25}]$, a = 9.7446(4), b = 7.6769(3), c = 4.7633(2) Å, β = 90.667(1)°, V = 356.31(4) Å^3, $P2_1/a$, and Z = 4, from the Mogok Stone Tract, Myanmar, and hydroxyl-herderite, $CaBePO_4[(OH)_{0.52}F_{0.48}]$, a = 9.7615(4), b = 7.6680(3), c = 4.7853(2) Å, β = 90.184(1)°, V = 358.18(4) Å^3, $P2_1/a$, and Z = 4, from the Sauberg mine, Morgenröther Zug, Ehrenfriedersdorf, Germany, have been refined to R_1 indices of 1.7%, in both cases, using Mo$K\alpha$ single-crystal X-ray diffraction data. Herderite from Mogok is associated with complex rare-element beryl-type granite pegmatite. Most herderite-series minerals are the product of late-stage processes in granite pegmatite evolution, typically of an exsolved fluid upon crystallization, and significant F-enrichment in these fluids appears to result in the domination of herderite over hydroxyl-herderite. Herderite is now documented from Mogok, Myanmar; Yichung, China; Brazil; and probably Erongo, Namibia. The pegmatites at Ehrenfriedersdorf, Germany have produced samples at the boundary between herderite and hydroxyl-herderite, if not possibly herderite as well.

Keywords: Herderite, hydroxyl-herderite, crystal structure, Mogok, Myanmar, Ehrenfriedersdorf, Germany