American Mineralogist, Volume 99, pages 494–499, 2014

Strontiohurlbutite, $SrBe_2(PO_4)_2$, a new mineral from Nanping No. 31 pegmatite, Fujian Province, Southeastern China

Can Rao[1,2,*], Rucheng Wang[1], Frédéric Hatert[3], Xiangping Gu[4], Luisa Ottolini[5], Huan Hu[1], Chuanwan Dong[2], Fabrice Dal Bo[3] and Maxime Baijot[3]

[1]State Key Laboratory for Mineral Deposits Research, School of Earth Sciences and Engineering, Nanjing University, Nanjing 210093, P.R. China
[2]Department of Earth Sciences, Zhejiang University, Hangzhou 310027, P.R. China
[3]Laboratoire de Minéralogie, B18, Université de Liège, B-4000 Liège, Belgium
[4]School of Earth Sciences and Info-physics, Central South University, Changsha, Hunan 410083, P.R. China
[5]C.N.R.-Istituto di Geoscienze e Georisorse (IGG), Unità di Pavia,Via A. Ferrata 1, I-27100 Pavia, Italy

Abstract

Strontiohurlbutite, ideally $SrBe_2(PO_4)_2$, is a new member of hurlbutite group discovered in the Nanping No. 31 pegmatite, Fujian province, southeastern China. Crystals are mainly found in zones I, II, and IV; they are platy, subhedral-to-anhedral, with a length from 5 μm to 1.5 mm. Associated minerals mainly include quartz, muscovite, beryl, hurlbutite, hydroxylherderite, apatite-group minerals, and phenakite. Strontiohurlbutite crystals are light blue, translucent-to-transparent, and have vitreous luster. The Mohs hardness is about 6, and the tenacity is brittle. Optically, strontiohurlbutite is biaxial (–), $\alpha = 1.563(3)$, $\beta = 1.569(2)$, $\gamma = 1.572(3)$ (white light), $2V_{meas} = 68.5(5)°$, and exhibits weak dispersion, r > v. The optical orientation is X = **b**, Y ≈ **c**. Electron-microprobe and SIMS analyses (average of 16) give SrO 29.30, P_2O_5 51.05, CaO 0.91, BaO 0.64, and BeO 17.71 wt%; total 99.61 wt%. The empirical formula, based on 8 O apfu, is $(Sr_{0.81}Ca_{0.05}Ba_{0.01})_{\Sigma 0.87}Be_{2.02}P_{2.05}O_8$. The stronger eight lines of the measured X-ray powder-diffraction pattern [*d* in Å(*I*)(*hkl*)] are: 3.554(100)(121); 3.355(51)(211); 3.073(38)(022); 2.542(67)(113); 2.230(42)(213); 2.215(87)(32$\bar{1}$); 2.046(54)(223); 1.714(32)(143). Strontiohurlbutite is monoclinic, space group $P2_1/c$; unit-cell parameters refined from single-crystal X-ray diffraction data are: $a = 7.997(3)$, $b = 8.979(2)$, $c = 8.420(7)$ Å, $\beta = 90.18(6)°$, $V = 604.7(1)$ Å^3 ($Z = 4$, calculated density = 3.101 g/cm^3). The mineral is isostructural with hurlbutite, $CaBe_2(PO_4)_2$, and with paracelsian, $BaAl_2Si_2O_8$. The formation of strontiohurlbutite is related to the hydrothermal alteration of primary beryl by late Sr- and P-rich fluids.

Keywords: Strontiohurlbutite, $SrBe_2(PO_4)_2$, new mineral, hurlbutite, Nanping No. 31 pegmatite, Fujian province, China