

Barioperovskite, BaTiO₃, a new mineral from the Benitoite Mine, California

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ABSTRACT

Barioperovskite, ideally BaTiO₃, is a new member of the perovskite group. It is found as micro- to nano-crystals in a host of amorphous material contained within hollow, tubular inclusions in benitoite from the Benitoite Mine, San Benito County, California, U.S.A. The mean chemical composition determined by electron-microprobe analysis is (wt%) BaO 65.46, TiO₂ 34.57, SiO₂ 0.89, sum 100.92. The empirical formula calculated on the basis of 3 O is Ba_{0.97}Ti_{0.98}Si_{0.03}O₃. Barioperovskite is orthorhombic, *Amm*2; $a = 3.9874 \text{ \AA}$, $b = 5.6751 \text{ \AA}$, $c = 5.6901 \text{ \AA}$, $V = 128.76 \text{ \AA}^3$, and $Z = 2$. The electron backscattered diffraction pattern is an excellent match to that of synthetic BaTiO₃ with the *Amm*2 structure. The strongest calculated X-ray powder diffraction lines from the synthetic BaTiO₃ data are [d in \AA , (I), hkl] 4.018 (18) (011), 2.845 (30) (002), 2.830 (100) (111), 2.316(20) (102), 2.312 (23) (120), 2.009 (28) (022), 1.640 (17) (113), 1.637 (19) (131), 1.633 (18) (202), and 1.415 (15) (222). The mineral is named after its composition, a Ba-dominant member of the perovskite group.

Keywords: Barioperovskite, new mineral, barium titanate, perovskite group, Benitoite Mine, BaTiO₃, BaTi₂O₅, BaTi₃O₇