

# Bavenite

# Ca<sub>4</sub>Be<sub>2</sub>Al<sub>2</sub>Si<sub>9</sub>O<sub>26</sub>(OH)<sub>2</sub>

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**Crystal Data:** Orthorhombic. *Point Group:* *mm2*. As radiating crystal groups, to 6 cm; as bladed crystals and rosettes of thin plates; also fine feltlike masses of needles, compact fibrous, chalklike massive. *Twining:* On {100}.

**Physical Properties:** *Cleavage:* Perfect on {001}, fair on {100}. Hardness = 5.5–6  
D(meas.) = 2.71–2.74 D(calc.) = 2.69–2.79 Weakly piezoelectric.

**Optical Properties:** Translucent to transparent. *Color:* Colorless to white. *Luster:* Vitreous.  
*Optical Class:* Biaxial (+). *Orientation:* X = c; Y = b; Z = a.  $\alpha = 1.578$ –1.586  
 $\beta = 1.579$ –1.585  $\gamma = 1.583$ –1.593  $2V(\text{meas.}) = 22^\circ$ –58°

**Cell Data:** *Space Group:* *Am2a*. a = 19.39(2) b = 23.19(2) c = 5.005(9) Z = 4

**X-ray Powder Pattern:** Baveno, Italy.

3.74 (100), 3.35 (90), 3.24 (80), 3.13 (70), 3.05 (70), 2.56 (60), 4.19 (50)

## Chemistry:

	(1)	(2)
SiO <sub>2</sub>	57.64	57.83
Al <sub>2</sub> O <sub>3</sub>	6.46	10.90
BeO	7.66	5.35
CaO	23.96	23.99
H <sub>2</sub> O <sup>+</sup>	3.56	
H <sub>2</sub> O <sup>-</sup>	0.32	1.93
Total	99.60	100.00

(1) Mesa Grande district, California, USA; corresponds to Ca<sub>4.11</sub>Be<sub>2.95</sub>Al<sub>1.22</sub>Si<sub>9.22</sub>O<sub>26</sub>•1.90H<sub>2</sub>O.

(2) Ca<sub>4</sub>Be<sub>2</sub>Al<sub>2</sub>Si<sub>9</sub>O<sub>26</sub>(OH)<sub>2</sub>.

**Occurrence:** As druses in miarolitic cavities in granite and associated pegmatites, formed by alteration of beryl and other beryllium-bearing minerals. Also in hydrothermal veins and skarns.

**Association:** Beryl, helvite, phenakite, bertrandite, quartz, epidote, stilbite, albite, orthoclase, titanite, chlorite, clinozoisite, tremolite.

**Distribution:** From Baveno and Val d'Ossola, Piedmont, Italy. At Strzegom (Striegau), Silesia, Poland. From the Czech Republic, at Jeclov, Věžná, and near Drahonín. At Takelund, southeast of Halden, Østfold, Norway. In Switzerland, from the Muotta Nera, Piz Lai Blau, Val Nalps and at Val Casaccia, Val Cristallina, Graubünden. In the USA, from the Himalaya mine, Mesa Grande district, and in the Rincon district, San Diego Co., California; at the Foote mine, Kings Mountain, Cleveland Co., North Carolina; from the Rutherford mine, Amelia, Amelia Co., Virginia; and elsewhere. In the Londonderry quarry, near Coolgardie, Western Australia. From Batystau, central Kazakhstan. In Russia, as large crystals at Akoudertia, Siberia; Malyshevo, Ural Mountains; and a number of other less-well-defined localities.

**Name:** For the original occurrence at Baveno, Italy.

**Type Material:** Municipal Museum of Natural History, Milan, Italy; Natural History Museum, Paris, France, 108.1881, 108.1882

**References:** (1) Artini, E. (1901) Di una nuova specie minerale trovata nel granito di Baveno. *Atti Rend. Accad. Lincei*, 10, 139–145 (in Italian). (2) Fleischer, M.F. and G. Switzer (1953) The bavenite problem. *Amer. Mineral.*, 38, 988–993. (3) Switzer, G. and L.E. Reichen (1960) Re-examination of pilinite and its identification with bavenite. *Amer. Mineral.*, 45, 757–762. (4) Berry, L.G. (1963) The composition of bavenite. *Amer. Mineral.*, 48, 1166–1168. (5) Cannillo, E. and A. Coda (1966) The crystal structure of bavenite. *Acta Cryst.*, 20, 301–309. (6) Loiacono, G.M., G. Kostecy, and J.S. White, Jr. (1982) Resolution of space group ambiguities in minerals. *Amer. Mineral.*, 67, 846–847.

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