

**Macdonaldite****BaCa<sub>4</sub>Si<sub>16</sub>O<sub>36</sub>(OH)<sub>2</sub>•10H<sub>2</sub>O**

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**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$  or  $mm2$ . Needlelike crystals show {010}, {001}, and {100}, and are elongated along [100], to 6 mm; also fibrous, in radiating aggregates, and granular.

**Physical Properties:** *Cleavage:* Perfect on {010}, good on {001}, poor or a fracture on {100}. Hardness = 3.5–4 D(meas.) = 2.27(2) D(calc.) = 2.27

**Optical Properties:** Transparent to translucent. *Color:* White to colorless. *Streak:* White. *Luster:* Satiny to vitreous.

*Optical Class:* Biaxial (+) or (-). *Orientation:*  $X = c$ ;  $Y = b$ ;  $Z = a$ .  $\alpha = 1.518(2)$   
 $\beta = 1.524(2)$   $\gamma = 1.530(2)$   $2V(\text{meas.}) = 90(5)^\circ$   $2V(\text{calc.}) = 90^\circ$

**Cell Data:** *Space Group:*  $Bmmb$ ,  $B2mb$ , or  $Bm2_1b$ .  $a = 14.06(1)$   $b = 23.52(2)$   
 $c = 13.08(1)$   $Z = 4$

**X-ray Powder Pattern:** Fresno Co., California, USA.

6.5 (100), 4.36 (80), 6.3 (50), 3.36 (50), 3.02 (45), 2.74 (45), 8.9 (40)

**Chemistry:**

	(1)
SiO <sub>2</sub>	61.1
TiO <sub>2</sub>	0.01
Al <sub>2</sub> O <sub>3</sub>	0.06
FeO	< 0.01
MnO	0.004
MgO	< 6.05
CaO	14.8
SrO	< 0.05
BaO	10.2
LOI	13.7
Total	[100.00]

(1) Fresno Co., California, USA; by D-C arc spectrography, loss on ignition taken as H<sub>2</sub>O, stated to be recalculated to 100.00%; corresponds to (Ba<sub>0.98</sub>Sr<sub>0.01</sub>)<sub>Σ=0.99</sub>(Ca<sub>3.90</sub>Mg<sub>0.02</sub>)<sub>Σ=3.92</sub>(Si<sub>15.03</sub>Al<sub>0.02</sub>)<sub>Σ=15.05</sub>O<sub>35.01</sub>•11.24H<sub>2</sub>O.

**Occurrence:** As veinlets, fracture coatings, and disseminated in a sanbornite-quartz-bearing metamorphic rock.

**Association:** Sanbornite, quartz.

**Distribution:** In the Big Creek-Rush Creek area, Fresno Co., and on Trumbull Peak, near Incline, Mariposa Co., California, USA.

**Name:** For Gordon Andrew MacDonald (1911–1978), American volcanologist, University of Hawaii, Honolulu, Hawaii, USA.

**Type Material:** California Division of Mines & Geology, San Francisco, California, USA.

**References:** (1) Alfors, J.T., M.C. Stinson, R.A. Matthews, and A. Pabst (1965) Seven new barium minerals from eastern Fresno County, California. *Amer. Mineral.*, 50, 314–340.  
 (2) Cannillo, E., G. Rossi, and L. Ungaretti (1968) The crystal structure of macdonaldite. *Atti Rend. Accad. Lincei*, 45, 399–414.