

**Crystal Data:** Tetragonal. *Point Group:* 4mm. As subhedral to euhedral tetragonal crystals, slightly elongated along [001], bounded principally by {110} and {001}, to 2.1 cm.

**Physical Properties:** *Cleavage:* Fair on {001}. Hardness = 3–4 D(meas.) = 4.43(2) D(calc.) = 4.45 Fluoresces pale yellow under SW UV.

**Optical Properties:** Transparent to translucent. *Color:* Lemon-yellow to canary-yellow, butterscotch-yellow to salmon-pink; yellow to colorless in thin section. *Streak:* White. *Luster:* Vitreous.

*Optical Class:* Uniaxial (-). *Pleochroism:* O = colorless; E = yellow, with anomalous blue interference colors.  $\omega = 1.775(3)$   $\epsilon = 1.765$

**Cell Data:** *Space Group:* P4bm.  $a = 8.518(2)$   $c = 5.211(1)$   $Z = 2$

**X-ray Powder Pattern:** Synthetic.

3.077 (100), 3.301 (45), 2.697 (25), 3.816 (20), 2.607 (20), 2.151 (20), 1.874 (20)

**Chemistry:**

	(1)	(2)	(3)
SiO <sub>2</sub>	21.8	23.8	23.72
TiO <sub>2</sub>	17.2	15.2	15.76
Al <sub>2</sub> O <sub>3</sub>	0.12		
FeO	1.0	0.77	
MnO	0.027	0.074	
MgO	< 0.05	0.19	
CaO	0.14	0.55	
SrO	0.28		
BaO	59.4	59.4	60.52
K <sub>2</sub> O	0.00	0.00	
H <sub>2</sub> O	0.00	0.00	
Total	[100.0]	[100.0]	100.00

(1–2) Rush Creek area, California, USA; by D-C arc spectrography, recalculated to 100%.

(3) Ba<sub>2</sub>TiOSi<sub>2</sub>O<sub>7</sub>.

**Occurrence:** Disseminated in gneissic metamorphic rocks composed mainly of sanbornite and quartz (Rush Creek, California, USA).

**Association:** Quartz, sanbornite, celsian, taramellite, diopside, pyrrhotite (Rush Creek, California, USA); bario-orthojoaquinite, benitoite, baotite, natrolite (Esquire mine No. 1, California, USA); gillespite, sanbornite, taramellite, pellyite, muirite, barite (Gunn claim, Canada).

**Distribution:** In the USA, in California, from the Rush Creek area and at the Esquire No. 1 mine, Big Creek, Fresno Co.; at the Gem mine, and in the Clear Creek district, at the Victor mine, and large crystals in the Junilla mine, San Benito Co.; on Trumbull Peak, near Incline, Mariposa Co. From the Gunn claim, Itsy Mountains, near Macmillan Pass, Yukon Territory, Canada. At Graulai and Üdersdorf, Eifel district, Germany.

**Name:** For the original localities in Fresno Co., California, 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) Moore, P.B. and S.J. Louisnathan (1969) The crystal structure of fresnoite, Ba<sub>2</sub>(TiO)Si<sub>2</sub>O<sub>7</sub>. *Zeits. Krist.*, 130, 438–448. (3) (1971) NBS Mono. 25, 9, 19.

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