Fresnoite $Ba_2TiOSi_2O_7$

Crystal Data: Tetragonal. *Point Group:* 4*mm*. 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_2	21.8	23.8	23.72
TiO_2	17.2	15.2	15.76
Al_2O_3	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_2O	0.00	0.00	
H_2O	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) $Ba_2TiOSi_2O_7$.

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, $Ba_2(TiO)Si_2O_7$. Zeits. Krist., 130, 438–448. (3) (1971) NBS Mono. 25, 9, 19.