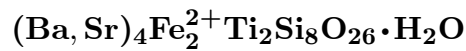


**Bario-orthojoaquinite**

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**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$  or  $mm2$ . As pseudotetragonal crystals, steep dipyramidal {111} and truncated by {001}, to 8 mm; pyramidal faces are curved and striated; as aggregates.

**Physical Properties:** *Cleavage:* {001}, good. *Hardness* = 5.5 *D*(meas.) = 3.96  
*D*(calc.) = 3.96

**Optical Properties:** Transparent to translucent. *Color:* Yellow-brown. *Streak:* Pale yellow. *Luster:* Vitreous.

*Optical Class:* Biaxial (+). *Pleochroism:* *X* = very pale yellow; *Y* = pale yellow; *Z* = yellow. *Orientation:* *X* = *a*; *Y* = *b*; *Z* = *c*. *Dispersion:*  $r > v$ , strong. *Absorption:*  $Z \gg Y > X$ .  
 $\alpha = 1.735$   $\beta = 1.737$   $\gamma = 1.800$   $2V$ (meas.) =  $10^\circ$ – $15^\circ$

**Cell Data:** *Space Group:*  $Ccmm$ ,  $Cc2m$ , or  $Ccm2$ . *a* = 10.477(5) *b* = 9.599(1)  
*c* = 22.59(1) *Z* = [4]

**X-ray Powder Pattern:** Gem mine, California, USA.  
2.997 (100), 2.953 (95), 2.824 (90), 5.64 (70), 2.935 (70), 4.30 (62), 3.203 (50)

**Chemistry:**

	(1)
SiO <sub>2</sub>	35.15
TiO <sub>2</sub>	11.33
Al <sub>2</sub> O <sub>3</sub>	0.57
RE <sub>2</sub> O <sub>3</sub>	0.00
FeO	9.47
MnO	0.62
CaO	0.17
SrO	3.34
BaO	38.56
Na <sub>2</sub> O	0.12
H <sub>2</sub> O	1.3
Total	100.63

(1) Gem mine, California, USA; by electron microprobe, corresponds to  
 $(\text{Ba}_{3.44}\text{Sr}_{0.44}\text{Al}_{0.15}\text{Ca}_{0.04})_{\Sigma=4.07}(\text{Fe}_{1.80}^{2+}\text{Mn}_{0.12}\text{Na}_{0.05})_{\Sigma=1.97}(\text{Ti}_{1.94}\text{Al}_{0.06})_{\Sigma=2.00}$   
 $\text{Si}_{8.00}\text{O}_{26}\cdot 0.93\text{H}_2\text{O}$ .

**Mineral Group:** Joaquinite group.

**Occurrence:** In a block of highly fractured basalt subjected to high-pressure metamorphism and serpentinization.

**Association:** Benitoite, baotite, fresnoite, natrolite.

**Distribution:** At the Gem mine, San Benito Co., California, USA.

**Name:** For its BARIum content, ORTHOrhombic symmetry, and membership in the *joaquinite* group.

**Type Material:** University of California, Santa Barbara, California; Harvard University, Cambridge, Massachusetts, 119525; National Museum of Natural History, Washington, D.C., USA, 149428.

**References:** (1) Wise, W.S. (1982) Strontiojoaquinite and bario-orthojoaquinite: two new members of the joaquinite group. *Amer. Mineral.*, 67, 809–816.

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