

**Crystal Data:** Monoclinic, pseudo-orthorhombic. *Point Group:* 2/m. Crystals prismatic, dominated by {110} and {120}, with chisel-shaped termination by {201}, to 5 cm; confused aggregates of crystals; massive. *Twinning:* Simple twinning on {100}; lamellar on {201}.

**Physical Properties:** *Cleavage:* {110}, poor; (110)  $\wedge$  (1 $\bar{1}$ 0) = 87°. *Fracture:* Subconchoidal. Hardness = ~6 D(meas.) = 3.29–3.32 D(calc.) = 3.342

**Optical Properties:** Transparent to translucent. *Color:* Colorless to white, pale yellow. *Luster:* Vitreous.

*Optical Class:* Biaxial (-).  $\alpha = 1.5702$   $\beta = 1.5824$   $\gamma = 1.5869$  2V(meas.) = 50°35'–52°42'

**Cell Data:** *Space Group:* P2<sub>1</sub>/a.  $a = 9.065$ –9.076  $b = 9.568$ –9.588  $c = 8.577$ –8.578  $\beta = 90.01^\circ$ –90.21° Z = 4

**X-ray Powder Pattern:** Benallt mine, Wales.

4.00 (100), 3.80 (70), 2.99 (50), 2.73 (50), 2.56 (50), 3.59 (45), 2.37 (45)

**Chemistry:**

	(1)	(2)
SiO <sub>2</sub>	33.01	32.01
Al <sub>2</sub> O <sub>3</sub>	27.16	27.16
Fe <sub>2</sub> O <sub>3</sub>	0.28	
MgO	0.14	
CaO	0.06	
BaO	38.53	40.83
Na <sub>2</sub> O	0.15	
K <sub>2</sub> O	0.54	
H <sub>2</sub> O	0.05	
Total	99.92	100.00

(1) Benallt mine, Wales. (2) BaAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub>.

**Polymorphism & Series:** Dimorphous with celsian.

**Mineral Group:** Feldspar group.

**Occurrence:** In a band through shales and sandstones, associated with a metamorphosed manganese deposit (Benallt mine, Wales).

**Association:** Celsian (Benallt mine, Wales).

**Distribution:** From Candoglia, Valle d'Ossola, Piedmont, Italy. In the Benallt mine, Rhiw, Lleyn Peninsula, Wales.

**Name:** A combination of the Greek *para*, for *near*, and the mineral's dimorph, *celsian*.

**Type Material:** n.d.

**References:** (1) Tacconi, E. (1905) Di un silicato di alluminio e bario [paracelsian] dei calcefiri di Candoglia in valle del Toce. Rend. R. Istit. Lombardo Sci. Lett., Milano, 38, 636–643, esp. 642 (in Italian). (2) (1907) Mineral. Mag., 14, 406 (abs. ref. 1). (3) Spencer, L.J. (1942) Barium feldspars, (celsian and paracelsian) from Wales. Mineral. Mag., 26, 231–245. (4) Smith, J.V. (1953) The crystal structure of paracelsian, BaAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub>. Acta Cryst., 6, 613–620. (5) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, framework silicates, 166–178. (6) Chiari, G., G. Gazzoni, J.R. Craig, G.V. Gibbs, and S.J. Louisnathan (1985) Two independent refinements of the structure of paracelsian, BaAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub>. Amer. Mineral., 70, 969–974.

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