

**Angastonite****CaMgAl<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>4</sub>·7H<sub>2</sub>O**

**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . As crusts of platy crystals to 100  $\mu$ m with {010} prominent.

**Physical Properties:** *Cleavage:* One on {010}. *Fracture:* n.d. *Tenacity:* n.d. *Hardness* = 2  
D(meas.) = 2.47 D(calc.) = 2.332

**Optical Properties:** Transparent to translucent. *Color:* Snow-white. *Streak:* White.

*Luster:* Pearly.

*Optical Class:* Biaxial (+).  $\alpha = 1.566(2)$   $\beta = 1.572(2)$   $\gamma = 1.584(2)$   $2V(\text{meas.}) = 70(2)^\circ$   
 $2V(\text{calc.}) = 71^\circ$  *Orientation:*  $X \approx a$ ,  $Y \approx b$ ,  $Z \approx c$ . *Pleochroism:* Very weak,  $X = Z =$  colorless,  
 $Y =$  colorless to pale yellow. *Absorption:*  $r = v$ . Parallel extinction and no axial dispersion.

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 13.303(1)$   $b = 27.020(2)$   $c = 6.1070(7)$   $\alpha = 89.64(1)^\circ$   
 $\beta = 83.44(1)^\circ$   $\gamma = 80.444(8)^\circ$   $Z = 6$

**X-ray Powder Pattern:** Penrice marble quarry, ~2 km north of Angaston, South Australia.  
13.38 (100), 11.05 (25), 5.73 (23), 8.01 (21), 2.888 (19), 2.856 (17), 10.22 (13)

<b>Chemistry:</b>	(1)	(2)
K <sub>2</sub> O	0.09	
CaO	9.87	11.16
MgO	8.17	8.02
Al <sub>2</sub> O <sub>3</sub>	18.02	20.29
P <sub>2</sub> O <sub>5</sub>	26.11	28.25
H <sub>2</sub> O	31.41	32.28
Total	93.67	100.00

(1) Penrice marble quarry, near Angaston, South Australia; average electron microprobe analysis supplemented by Raman spectroscopy; corresponds to (Ca<sub>0.96</sub>K<sub>0.01</sub>)<sub>Σ=0.97</sub>Mg<sub>1.10</sub>Al<sub>1.92</sub>P<sub>2.00</sub>O<sub>7.95</sub>(OH)<sub>4.00</sub>·7.47H<sub>2</sub>O. (2) CaMgAl<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>4</sub>·7H<sub>2</sub>O.

**Occurrence:** In phosphate mineralization in a gossanous weathered zone above recrystallized limestone (now marble).

**Association:** Minyulite, perhamite, crandallite, apatite-(CaF).

**Distribution:** From the Penrice marble quarry, ~2 km north of Angaston, South Australia [TL].

**Name:** For the town of *Angaston*, Australia, named for George Fife Angas (1789-1879), businessman and Member of Parliament of South Australia, who settled in the area in the 1850s.

**Type Material:** Museum Victoria, Melbourne, Victoria, Australia (M45575 and M50494).

**References:** (1) Mills, S.J., L.A. Groat, S.A. Wilson, W.D. Birch, P.S. Whitfield, and M. Raudsepp (2008) Angastonite, CaMgAl<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>4</sub>·7H<sub>2</sub>O: a new phosphate mineral from Angaston, South Australia. *Mineral. Mag.*, 72, 1011-1020.