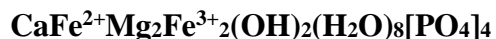


Jahnsite-(CaFeMg)

Crystal Data: Monoclinic. *Point Group:* 2/m. As blocky to short prismatic crystals to 0.2 mm.
Twining: On {001} confirmed by X-ray analysis.

Physical Properties: *Cleavage:* Good on {001}. *Fracture:* Splintery. *Tenacity:* Brittle.
Hardness = ~ 4 D(meas.) = 2.76(4) D(calc.) = 2.772

Optical Properties: Transparent. *Color:* Brownish orange. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (-). $\alpha = 1.629(4)$ $\beta = 1.658(4)$ $\gamma = 1.677(4)$ $2V(\text{calc.}) = 76.8^\circ$
Pleochroism: Weak; Y = orange-pink, Z = pale orange, X = very pale gray. *Absorption:* Y > Z > X.

Cell Data: *Space Group:* P2/a. $a = 14.975(5)$ $b = 7.1645(14)$ $c = 9.928(2)$ $\beta = 110.65(3)^\circ$
Z = 2

X-ray Powder Pattern: Tom's quarry, Kapunda, South Australia.
9.339 (100), 2.839 (35), 4.923 (20), 3.562 (20), 3.518 (20), 3.453 (20), 2.965 (20)

| | |
|--------------------------------|---------|
| Chemistry: | (1) |
| Na ₂ O | 0.65 |
| CaO | 4.74 |
| MgO | 6.47 |
| MnO | 5.02 |
| FeO | [9.85] |
| Fe ₂ O ₃ | [20.18] |
| Al ₂ O ₃ | 0.06 |
| P ₂ O ₅ | 34.41 |
| H ₂ O | [19.46] |
| Total | 100.84 |

(1) Tom's quarry, Kapunda, South Australia; average of 17 electron microprobe analyses supplemented by IR spectroscopy, H₂O calculated from structure, Fe₂O₃ and FeO calculated from crystal-chemical constraints; corresponds to (Ca_{0.70}Na_{0.17}Mn²⁺_{0.16}) $\Sigma=1.03$ Fe²⁺_{1.00}(Mg_{1.33}Mn²⁺_{0.43}Fe³⁺_{0.24}) $\Sigma=2.00$ (Fe³⁺_{1.99}Al_{0.01}) $\Sigma=2.00$ (PO₄)_{4.01}(OH)_{2.10}H₂O_{7.88}.

Mineral Group: Whiteite-jahnsite group.

Occurrence: A secondary mineral in low-grade phosphorites derived by leaching of weakly phosphatic limestones or low-grade primary phosphorites.

Association: Jahnsite-(NaFeMg), goethite, fluorapatite.

Distribution: From Tom's quarry, Koonunga Hill area, 10 km E of Kapunda, South Australia.

Name: For a jahnsite group mineral with dominant Ca in the X site and Fe²⁺ and Mg in the M1 and M2 sites.

Type Material: South Australian Museum, Adelaide, South Australia, Australia (G34045).

References: (1) Elliot, P. (2016) Jahnsite-(CaFeMg), a new mineral from Tom's quarry, South Australia: description and crystal structure. *Eur. J. Mineral.*, 28(6), 991-996. (2) (2017) *Amer. Mineral.*, 102, 1962-1963 (abs. ref. 1).