

Crystal Data: Monoclinic. *Point Group:* 2/m. As six-sided pseudo-orthorhombic twinned prisms, to 1 mm, with shallow wedge-like terminations and striations parallel to [010], both as isolated twinned crystals and in subparallel to divergent intergrowths. Typical crystals have as many as five chemical zones from base to termination corresponding to jahnsite-(NaMnMg), jahnsite-(NaFeMg), jahnsite-(CaMnMg), jahnsite-(NaFeMg), and jahnsite-(CaMgMg). *Twinning:* Ubiquitous, both simple contact and polysynthetic by reflection on {001}.

Physical Properties: *Cleavage:* Good on {001}. *Tenacity:* Brittle. *Fracture:* Splintery. Hardness = 4 D(meas.) = 2.58(2) D(calc.) = 2.608 Slowly dissolves in cold dilute HCl.

Optical Properties: Transparent. *Color:* Yellow with orange-red bands near the terminations. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (-). $\alpha = 1.632(1)$ $\beta = 1.669(1)$ $\gamma = 1.671(1)$ 2V(meas.) = 25(5)° 2V(calc.) = 26° *Dispersion:* $r > v$, very strong. *Orientation:* $Y = b$, $Z \wedge a = +28^\circ$ (in β obtuse). *Pleochroism:* Noticeable, X = colorless, Y and Z = beige. *Absorption:* $Y = Z > X$.

Cell Data: *Space Group:* P2/a. $a = 15.0811(16)$ $b = 7.1403(8)$ $c = 9.8299(11)$ $\beta = 110.445(1)^\circ$ $Z = 2$

X-ray Powder Pattern: Tip Top mine, Custer County, South Dakota, USA. 9.218 (100), 2.819 (70), 4.884 (25), 3.537 (25), 2.973 (25), 2.854 (20), 1.933 (20)

Chemistry:	(1)	(2)
Na ₂ O	2.82	3.89
CaO	0.34	
MnO	0.32	
MgO	10.27	10.11
Fe ₂ O ₃	27.35	30.35
P ₂ O ₅	35.93	35.61
H ₂ O	[21.58]	20.34
Total	98.61	100.00

(1) Tip Top mine, Custer County, South Dakota, USA; average of 3 electron microprobe analyses, H₂O calculated from the crystal structure and for charge balance; corresponding to (Na_{0.72}Ca_{0.05}Mn²⁺_{0.04})(Fe³⁺_{0.72}Mg_{0.01})Mg_{2.00}Fe³⁺_{2.00}(PO_{3.77}OH_{0.23})₄(OH)₂·8H₂O.
(2) NaFe³⁺Mg₂Fe³⁺₂(PO₄)₄(OH)₂·8H₂O.

Mineral Group: Whiteite-jahnsite group.

Occurrence: A late-stage hydrothermal decomposition product of triphylite in a complex granitic pegmatite.

Association: Heterosite, leucophosphite, dufrénite, barboselite, rockbridgeite, mitridatite, ushkovite.

Distribution: At the Tip Top mine, Custer County, South Dakota, USA.

Name: Root name, *Jahnsite*, indicates a member of the group with $M3 = \text{Fe}^{3+}$; suffixes indicate cations in X , $M1$, and $M2$.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (58590, 58591, and 58592).

References: (1) Kampf, A.R., I.M. Steele, and T.A. Loomis (2008) Jahnsite-(NaFeMg), a new mineral from the Tip Top mine, Custer County, South Dakota: Description and crystal structure. *Amer. Mineral.*, 93, 940-945.