

Jahnsite-(NaMnMg)**(Na, Ca)Mn²⁺(Mg, Fe³⁺)₂Fe³⁺₂(PO₄)₄(OH)₂·8H₂O**

Crystal Data: Monoclinic. *Point Group:* 2/m. As prisms to 0.5 mm, elongate along [100], exhibiting {100}, {001}, and {011}. *Twinning:* By reflection on {001}.

Physical Properties: *Cleavage:* Perfect on {001}. *Fracture:* Irregular, stepped splintery. *Tenacity:* Brittle. Hardness = ~4 D(meas.) = 2.68(1)-2.69(3) D(calc.) = 2.684-2.738 Slowly soluble in dilute HCl.

Optical Properties: Translucent to transparent. *Color:* Light orange to orange-yellow.

Streak: Very pale yellow. *Luster:* Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.642$ $\beta = 1.675$ $\gamma = 1.677$ $2V(\text{meas.}) = 27(2)^\circ$ *Orientation:* $Z = b$; $X \wedge c = 51^\circ$ in obtuse β . *Pleochroism:* $X = \text{colorless}$, $Y = Z = \text{orange-yellow}$. *Absorption:* $Y \approx Z > X$. *Dispersion:* Very strong, $r < v$.

Cell Data: *Space Group:* $P2_1/a$. $a = 15.1045(15)$ $b = 7.1629(2)$ $c = 9.8949(7)$ $\beta = 110.640(7)^\circ$ $Z = 2$

X-ray Powder Pattern: Sapucaia pegmatite, Conselheiro Pena district, Minas Gerais, Brazil. 9.29 (100), 2.834 (91), 2.601 (33), 1.944 (33), 3.546 (32), 4.91 (30), 5.02 (27)

Chemistry:	(1)	(2)
Na ₂ O	2.16	2.35
CaO	1.73	1.53
MgO	7.64	6.15
MnO	[8.27]	[10.72]
Mn ₂ O ₃	0	[3.94]
Fe ₂ O ₃	23.83	20.77
Al ₂ O ₃	1.31	0.13
P ₂ O ₅	35.23	34.02
H ₂ O	20.31	19.45
Total	100.48	99.06

(1) Sapucaia pegmatite, Minas Gerais, Brazil; average electron microprobe analysis, H₂O and Mn apportioned from structure analysis; corresponds to (Na_{0.56}Ca_{0.25}Mn²⁺_{0.09}) $\Sigma=0.90$ (Mn²⁺_{0.85}Fe³⁺_{0.15}) $\Sigma=1.00$ (Mg_{1.53}Fe³⁺_{0.47}) $\Sigma=2.00$ (Fe³⁺_{1.79}Al_{0.21}) $\Sigma=2.00$ (PO₄)₄(OH)_{1.83}(H₂O)_{8.17}. (2) White Rock No. 2 quarry, South Australia, Australia; average electron microprobe analysis, H₂O and Mn apportioned from structure analysis; corresponding to (Na_{0.63}Ca_{0.23}Mn²⁺_{0.14}) $\Sigma=1.00$ (Mn²⁺_{0.68}Mn³⁺_{0.26}Fe³⁺_{0.05}Mg_{0.01}) $\Sigma=1.00$ (Mg_{1.26}Mn²⁺_{0.43}Mn³⁺_{0.16}Fe³⁺_{0.15}) $\Sigma=2.00$ (Fe³⁺_{1.97}Al_{0.02}) $\Sigma=1.99$ (PO₄)₄(OH)_{1.98}(H₂O)_{8.02}.

Mineral Group: Jahnsite group, jahnsite subgroup; Fe³⁺ > Al in the M(3) structural site.

Occurrence: A low temperature, secondary mineral formed by alteration of primary phosphates in zoned granitic pegmatite.

Association: Frondelite, albite, meurigite-K, phosphosiderite, strengite (Sapucaia); phosphosiderite, ushkovite, strunzite, bermanite (White Rock); jahnsite-(NaFeMg) (Tip Top).

Distribution: In the Sapucaia pegmatite, 12 km north northeast of Galiléia, Conselheiro Pena district, Minas Gerais, Brazil and the White Rock No. 2 quarry, Bimbowrie Conservation Park, ~22 km north of Olary, South Australia, Australia. At the Tip Top pegmatite, South Dakota, USA.

Name: Root name, *Jahnsite*, indicates a member of the group with M(3) = Fe³⁺; the suffix indicates sequentially the dominant atom in the X, M(1), and M(2) structural positions.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (66701) and the South Australian Museum, Adelaide, South Australia, Australia (G34298).

References: (1) Kampf, A.R., P. Elliott, B.P. Nash, L. Chiappino, and S. Varvello (2018) Jahnsite-(NaMnMg), a new Jahnsite-group mineral from the Sapucaia Mine, Brazil and the White Rock No. 2 quarry, Australia. *Can. Mineral.*, 56(6), 871-882. (2) (2021) *Amer. Mineral.*, 106, 1362 (abs. ref. 1).