

Jahnsite-(CaMnMg)**CaMn²⁺(Mg, Fe²⁺)₂Fe³⁺(PO₄)₄(OH)₂·8H₂O**

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Crystal Data: Monoclinic. *Point Group:* 2/m. As tabular to elongated prismatic crystals, striated on {201} and {100} || [010], to 1 cm; common forms include {001}, {100}, {201}, {201̄}, {101̄}, {011}, {110}, {111̄}. May be acicular; in twinned parallel aggregates; as warty granular masses. *Twining:* By reflection on {001}, producing a pseudo-orthorhombic appearance.

Physical Properties: *Cleavage:* Good on {001}. *Tenacity:* Brittle. Hardness = 4
D(meas.) = 2.706–2.718 D(calc.) = 2.715

Optical Properties: Transparent to translucent. *Color:* Nut-brown, purplish brown, yellow, yellow-orange, greenish yellow, red-brown, red-orange, pale green. *Luster:* Vitreous to subadamantine.

Optical Class: Biaxial (-). *Pleochroism:* X = pale purple; Y = deep purplish brown; Z = yellow with a tinge of green. *Orientation:* Z = b; Y ∧ c ≈ 18°. *Absorption:* Y >> Z > X. α = 1.640(3) β = 1.658(3) γ = 1.670(3) 2V(meas.) = Large.

Cell Data: *Space Group:* P2/a. a = 14.94(2) b = 7.14(1) c = 9.93(1) β = 110.16(8)°
Z = 2

X-ray Powder Pattern: Tip Top mine, South Dakota, USA.
9.27 (10), 2.825 (8b), 4.91 (6b), 3.522 (5), 2.950 (5), 5.66 (4), 4.63 (4)

Chemistry:	(1)	(1)
	P ₂ O ₅ 32.2	MgO 9.4
	Al ₂ O ₃ 2.1	CaO 6.6
	Fe ₂ O ₃ 15.1	H ₂ O ⁺ 18.8
	MnO 8.0	<hr/> Total 92.2

(1) Tip Top mine, South Dakota, USA; by electron microprobe, total Fe as Fe₂O₃, total Mn as MnO, H₂O by the Penfield method; corresponding to Ca_{1.00}Mn_{1.15}Mg_{1.75}(Fe_{1.65}³⁺Al_{0.40})_{Σ=2.05}(OH)_{2.05}(PO₄)₄·7.9H₂O.

Mineral Group: Whiteite group; Fe³⁺ > Al in the M(3) structural site.

Occurrence: A late-stage hydrothermal decomposition product of primary triphylite-lithiophilite in complex granite pegmatites.

Association: Leucophosphite, huréaulite, collinsite, ferrisicklerite, robertsite, rockbridgeite, triphylite, tavorite, messelite, vivianite (Custer Co., South Dakota, USA); laueite, strunzite (Palermo #1 mine, New Hampshire, USA); graftonite, johnsomervilleite, mitridatite, phosphosiderite, rockbridgeite, vivianite, apatite, garnet (Glen Chosaidh, Scotland).

Distribution: In the USA, from the Tip Top, White Elephant, Bull Moose, Big Chief, and Linwood mines, near Custer, Custer Co., South Dakota. In the Sapucaia pegmatite mine, about 50 km east-southeast of Governador Valadares, Minas Gerais, Brazil. From Glen Chosaidh, Loch Quoich, Inverness-shire, Scotland.

Name: Honors Professor Richard Henry Jahns (1915–1983), specialist in pegmatite mineralogy, Stanford University, California, USA; the suffix indicates sequentially the dominant atom in the X, M(1), and M(2) structural positions.

Type Material: National Museum of Natural History, Washington, D.C., USA.

References: (1) Moore, P.B. (1974) I. Jahnsite, segelerite, and robertsite, three new transition metal phosphate species. *Amer. Mineral.*, 59, 48–53. (2) Moore, P.B. and T. Araki (1974) Jahnsite, CaMn²⁺Mg₂(H₂O)₈Fe³⁺(OH)₂[PO₄]₄: a novel stereoisomerism of ligands about octahedral corner-chains. *Amer. Mineral.*, 59, 964–973. (3) Moore, P.B. and J. Ito (1978) I. Whiteite, a new species, and a proposed nomenclature for the jahnsite-whiteite complex series. *Mineral. Mag.*, 42, 309–316.

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