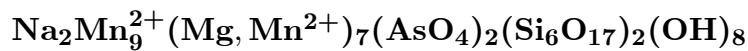


Johninnesite

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Crystal Data: Triclinic. *Point Group:* 1 or $\bar{1}$. As fibrous aggregates, may be plumose, to 4.5 cm; individuals are elongated along [001]. *Twinning:* An indeterminate twinninglike intergrowth was observed.

Physical Properties: *Cleavage:* Good on {100}, poor on {010}. *Tenacity:* Friable in aggregate. Hardness = n.d. D(meas.) = 3.48(4) D(calc.) = 3.51

Optical Properties: Transparent. *Color:* Light yellowish brown; colorless in transmitted light. *Streak:* Light brownish yellow. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Dispersion:* $r > v$, distinct. $\alpha = 1.6742(4)$ $\beta = 1.6968(3)$ $\gamma = 1.6999(3)$ $2V(\text{meas.}) = 41.9(2)^\circ$ $2V(\text{calc.}) = 40.9^\circ$

Cell Data: *Space Group:* $P1$ or $P\bar{1}$. $a = 10.44(2)$ $b = 11.064(6)$ $c = 9.62(1)$ $\alpha = 107.43(7)^\circ$ $\beta = 82.7(1)^\circ$ $\gamma = 111.6(1)^\circ$ $Z = 1$

X-ray Powder Pattern: Kombat mine, Namibia.

2.676 (100), 9.8 (60), 3.23 (60), 5.99 (40), 3.38 (40), 2.479 (40), 1.539 (40b)

Chemistry:

	(1)	(2)
SiO ₂	35.5	34.68
As ₂ O ₅	10.6	11.05
FeO	0.1	
MnO	40.7	40.94
MgO	8.2	7.75
Na ₂ O	3.1	2.98
H ₂ O	2.6	2.60
Total	100.8	100.00

(1) Kombat mine, Namibia; by electron microprobe, total As as As₂O₅, total Mn as MnO, H₂O by the Penfield method. (2) Na₂Mg₄Mn₁₂As₂Si₁₂O₄₃(OH)₆.

Occurrence: In low-temperature hydrothermal veins cutting metamorphosed Fe-Mn ores.

Association: Kentrolite, rhodonite, richterite, barite, calcite.

Distribution: From the Kombat mine, 49 km south of Tsumeb, Namibia.

Name: Honors John Innes, mineralogist of the Tsumeb Corporation, for his contributions to the mineralogy of the Tsumeb and Kombat mines.

Type Material: National Museum of Natural History, Washington, D.C., USA, 163207.

References: (1) Dunn, P.J., D.R. Peacor, S.-C. Su, J.A. Nelen, and O. von Knorring (1986) Johninnesite, a new sodium manganese arsenosilicate from the Kombat Mine, Namibia. Mineral. Mag., 50, 667–670. (2) (1988) Amer. Mineral., 73, 928 (abs. ref. 1).