Johninnesite  
\( \text{Na}_2\text{Mn}_9^{2+}\text{Mg}_7\text{Mn}^{2+}_7\text{AsO}_4\text{Si}_6\text{O}_{17}\text{OH}_2 \)  

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Crystal Data:  
Triclinic.  
Point Group: 1 or \( \overline{1} \).  
As fibrous aggregates, may be plumose, to 4.5 cm; individuals are elongated along [001].  
Twining: An indeterminate twinning-like intergrowth was observed.

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

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

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

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

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:  
\[
\begin{array}{cc}
\text{SiO}_2 & 35.5 \quad 34.68 \\
\text{As}_2\text{O}_5 & 10.6 \quad 11.05 \\
\text{FeO} & 0.1 \\
\text{MnO} & 40.7 \quad 40.94 \\
\text{MgO} & 8.2 \quad 7.75 \\
\text{Na}_2\text{O} & 3.1 \quad 2.98 \\
\text{H}_2\text{O} & 2.6 \quad 2.60 \\
\text{Total} & 100.8 \quad 100.00
\end{array}
\]

(1) Kombat mine, Namibia; by electron microprobe, total As as \( \text{As}_2\text{O}_5 \), total Mn as MnO, \( \text{H}_2\text{O} \) by the Penfield method.  
(2) \( \text{Na}_2\text{Mg}_4\text{Mn}_{12}\text{As}_4\text{Si}_{12}\text{O}_{43}\text{(OH)}_6 \).

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.


References:  