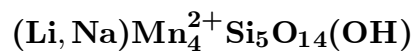


Nambulite

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As prismatic to tabular crystals, to 8 mm; massive in veinlets.

Physical Properties: *Cleavage:* Perfect on {001}, distinct on {010} and {100}.
Hardness = 6.5 D(meas.) = 3.53(1) D(calc.) = 3.55

Optical Properties: Transparent. *Color:* Reddish brown with an orange tint. *Streak:* Pale yellow. *Luster:* Vitreous.

Optical Class: Biaxial (+). *Pleochroism:* Slight. *Orientation:* $X' \wedge c = 19^\circ$ on {010}.

Dispersion: $r > v$, weak. $\alpha = 1.707(2)$ $\beta = 1.710(2)$ $\gamma = 1.730(2)$ $2V(\text{meas.}) = 30(2)^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 7.621(5)$ $b = 11.761(8)$ $c = 6.731(5)$ $\alpha = 92^\circ 46(3)'$
 $\beta = 95^\circ 5(3)'$ $\gamma = 106^\circ 52(5)'$ $Z = 2$

X-ray Powder Pattern: Funakozawa mine, Japan.

2.96 (100), 2.97 (80), 2.92 (70), 3.17 (65), 3.07 (60), 3.09 (55), 3.14 (45)

Chemistry:

	(1)		(1)
SiO ₂	49.23	Na ₂ O	2.49
TiO ₂	0.01	K ₂ O	0.04
Al ₂ O ₃	0.37	Cl	0.00
Fe ₂ O ₃	0.40	H ₂ O ⁺	1.63
MnO	40.67	H ₂ O ⁻	0.26
MgO	1.32	CO ₂	0.19
CaO	0.81	P ₂ O ₅	0.02
Li ₂ O	1.55	SO ₃	0.00
		<u>Total</u>	<u>98.99</u>

(1) Funakozawa mine, Japan; corresponding to $(\text{Li}_{0.50}\text{Na}_{0.49}\text{K}_{0.01})_{\Sigma=1.00}(\text{Mn}_{3.48}\text{Mg}_{0.20}\text{Li}_{0.14}\text{Ca}_{0.09}\text{Al}_{0.04}\text{Fe}_{0.03})_{\Sigma=3.98}\text{Si}_5\text{O}_{13.90}(\text{OH})_{1.10}$.

Polymorphism & Series: Forms a series with natronambulite.

Occurrence: In veinlets cutting braunite ores in chert (Funakozawa mine, Japan).

Association: Braunite, albite, neotocite, rhodochrosite (Funakozawa mine, Japan).

Distribution: In the Funakozawa and Ohtaniyama mines, Ohno, Iwate Prefecture, and the Gozaisho mine, Iwaki, Fukushima Prefecture, Japan.

Name: For Professor Matsuo Nambu, Tohoku University, Sendai, Japan.

Type Material: National Science Museum, Tokyo, Japan, M18829.

References: (1) Yoshii, M., Y. Aoki, and K. Maeda (1972) Nambulite, a new lithium- and sodium-bearing manganese silicate from the Funakozawa mine, northeastern Japan. *Mineral. J. (Japan)*, 7, 29–44. (2) (1973) *Amer. Mineral.*, 58, 1112 (abs. ref. 1). (3) Narita, H., K. Koto, and N. Morimoto (1975) The crystal structure of nambulite $(\text{Li, Na})\text{Mn}_4\text{Si}_5\text{O}_{14}(\text{OH})$. *Acta Cryst.*, 31, 2422–2426.