Natronambulite $(Na,Li)Mn_4^{2+}Si_5O_{14}(OH)$

Crystal Data: Triclinic. *Point Group:* 1 or $\bar{1}$. Tabular prismatic crystals, to 6 cm; also as coarse-grained mosaic aggregates.

Physical Properties: *Cleavage:* Perfect on {100} and {001}, distinct on {010}. Hardness = 5.5–6 D(meas.) = 3.51 D(calc.) = 3.50

Optical Properties: Transparent. *Color:* Pinkish orange to pink, deep red; in thin section, very pale yellow. *Streak:* White, with slight orange tint. *Luster:* Vitreous. *Optical Class:* Biaxial (+). *Dispersion:* $r > v$, distinct. *Absorption:* $Z > Y = X$. $\alpha = 1.703$–1.706 $\beta = 1.710$–1.712 $\gamma = 1.726$–1.730 2V(meas.) = 45°–48°

Cell Data: *Space Group:* $P1$ or $P\bar{1}$. $a = 7.620$ $b = 11.762$ $c = 6.737$ $\alpha = 92.81°$ $\beta = 94.55°$ $\gamma = 106.87°$ Z = [2]

X-ray Powder Pattern: Tanohata mine, Japan.
3.559 (100), 7.13 (47), 3.078 (45), 6.70 (44), 3.348 (40), 2.506 (38), 2.972 (34)

Chemistry:

	(1)	(2)
SiO_2	49.20	48.97
FeO	0.11	0.15
MnO	39.46	40.30
MgO	1.11	2.16
CaO	3.42	2.87
Li_2O	0.44	0.98
Na_2O	4.14	3.12
H_2O^+	1.48	1.50
H_2O^-		0.20
Total	99.36	100.25

(1) Tanohata mine, Japan; by electron microprobe, Li and H_2O by wet chemical analysis; corresponds to $(Na_{0.82}Li_{0.18})_{\Sigma=1.00}(Mn_{3.41}Ca_{0.37}Mg_{0.17}Fe_{0.01})_{\Sigma=3.96}Si_{5.02}O_{14.00}(OH)_{1.00}$.
(2) Kombat mine, Namibia; corresponds to $(Na_{0.61}Li_{0.40})_{\Sigma=1.01}(Mn_{3.45}Mg_{0.33}Ca_{0.31}Fe_{0.01})_{\Sigma=4.10}Si_{4.95}O_{13.99}(OH)_{1.01}$.

Polymorphism & Series: Forms a series with nambulite.

Occurrence: In banded ore of a contact metamorphosed bedded manganese deposit, and as an accessory mineral in an albite-microcline-quartz pegmatite cutting the ore (Tanohata mine, Japan).

Association: Aegirine, manganoan arfvedsonite, rhodonite, kôzulite, marsturite, sérandite, quartz, albite, microcline (Tanohata mine, Japan); gypsum, brushite, cahnite, chlorite, kentrolite, barite, calcite (Kombat mine, Namibia).

Distribution: From the Tanohata mine, Iwate Prefecture, Japan. At the Kombat mine, 49 km south of Tsumeb, Namibia.

Name: For sodium, *natrium*, in its composition, and its relation to *nambulite*.

Type Material: National Science Museum, Tokyo, Japan, M23817.

References: (1) Matsubara, S., A. Kato, and T. Tiba (1985) Natronambulite, (Na, Li)(Mn, Ca)$_4$Si$_5$O$_{14}$OH, a new mineral from the Tanohata mine, Iwate Prefecture, Japan. Mineral. J. (Japan), 12, 332–340. (2) (1987) Amer. Mineral., 72, 224 (abs. ref. 1). (3) von Knorring, O., T.G. Sahama, and R. Törnroos (1978) Second find of nambulite. Neues Jahrb. Mineral., Monatsh., 346–348.