

Epistolite

Na₂(Nb, Ti)₂Si₂O₉·nH₂O

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Crystal Data: Triclinic. *Point Group:* 1. As crystals, rectangular and tabular on {001}, to 5 cm. As irregular plates and curved lamellar masses.

Physical Properties: *Cleavage:* Perfect on {001}, distinct on {110}. *Tenacity:* Very brittle to friable. Hardness = 1.5–3 D(meas.) = 2.65–2.89 D(calc.) = [3.18]

Optical Properties: Opaque to translucent, transparent in thin sheets. *Color:* White, gray, yellow-gray, tan, light brown; in thin section, colorless. *Luster:* Pearly to silky. *Optical Class:* Biaxial (-). *Orientation:* $Z \wedge c = 70^\circ$. *Dispersion:* $r > v$, inclined. $\alpha = 1.610$ $\beta = 1.650\text{--}1.720$ $\gamma = 1.682\text{--}1.770$ $2V(\text{meas.}) = \sim 60^\circ\text{--}80^\circ$

Cell Data: *Space Group:* P1. $a = 5.41$ $b = 7.08$ $c = 12.07$ $\alpha = 103^\circ 03'$ $\beta = 96^\circ 03'$ $\gamma = 88^\circ 36'$ $Z = 2$

X-ray Powder Pattern: Ilímaussaq intrusion, Greenland. 4.322 (10), 2.99 (9), 2.869 (9), 12.00 (8), 5.902 (7), 1.790 (7), 2.155 (6)

Chemistry:	(1)	(2)	(1)	(2)
SiO ₂	27.59	25.60	CaO	0.77
TiO ₂	7.22	14.55	Na ₂ O	17.59
ZrO ₂		0.00	K ₂ O	trace
Al ₂ O ₃		2.05	F	1.98
Nb ₂ O ₅	33.56	31.40	H ₂ O ⁺	9.26
Ta ₂ O ₅		0.90	H ₂ O ⁻	1.75
FeO	0.20	0.90	P ₂ O ₅	2.10
MnO	0.30	1.20	-O = F ₂	0.83
MgO	0.13	0.00	Total	99.52
				99.92

(1) Julianehåb district, Greenland; material partly altered. (2) Lovozero massif, Russia.

Occurrence: In alkalic pegmatites, albitites, sodalite xenoliths, and hydrothermal veins.

Association: Aegirine, albite, murmanite, sphalerite, manganoan pectolite, neptunite, steenstrupine, sodalite, eudialyte, nenadkevichite.

Distribution: At a number of localities in the Ilímaussaq intrusion, southern Greenland. From the Lovozero massif, Kola Peninsula, Russia. At Mont Saint-Hilaire and near Saint-Amable, Quebec, Canada.

Name: From the Greek for *letter*, in allusion to the flat rectangular crystal habit and white color.

Type Material: University of Copenhagen, Copenhagen, Denmark, 319, 320.

References: (1) Dana, E.S. and W.E. Ford (1909) Dana's system of mineralogy, (6th edition), app. II, 39. (2) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 562–564. (3) Khalilov, A.P., Y.S. Makarov, K.S. Mamedov, and L.A. P'yanzina (1965) Crystal structure of minerals of the murmanite-lomonosovite group. Doklady Acad. Nauk SSSR, 162, 179–182 (in Russian). (4) Karup-Møller, S. (1986) Epistolite from the Ilímaussaq alkaline complex in South Greenland. Neues Jahrb. Mineral., Abh., 155, 289–304. (5) Mandarino, J.A. and V. Anderson (1989) Montereian Treasures. Cambridge Univ. Press, 76.