Selivanovaite $NaTi_3(Ti, Na, Fe, Mn)_4[(Si_2O_7)_2O_4(OH, H_2O)_4]\cdot nH_2O$

Crystal Data: Triclinic. *Point Group*: 1. As platy metacrysts to 8 mm.

Physical Properties: *Cleavage*: Perfect on {001}; weak on {110}. *Fracture*: Stepped. *Tenacity*: Brittle. Hardness = ~3 D(meas.) = 3.15(3) D(calc.) = 3.34 Soluble in 10% HCl.

Optical Properties: Translucent. *Color*: Dark orange; yellowish brown in transmitted light. *Streak*: Brownish-white. *Luster*: Vitreous to greasy.
Optical Class: Biaxial (+). α = 1.79(1) β = 1.81(1) γ = 1.87(1) 2V(meas.) = 40(5)° 2V(calc.) = 57.3° *Orientation*: $Z \wedge c$ = 5-10°.

Cell Data: Space Group: $P1$. a = 8.673(5) b = 8.694(3) c = 12.21(1) α = 92.70(5)° β = 108.46(7)° γ = 105.40(4)° Z = 2

X-ray Powder Pattern: Mt. Kedykvyrpakhk, Lovozero alkaline massif, Kola Peninsula, Russia. 11.43 (100), 3.108 (35), 6.37 (25), 3.043 (20), 2.596 (17), 4.208 (16), 5.73 (15)

Chemistry:

	(1)		(1)
Na_2O	5.45	TiO_2	31.17
MgO	0.59	MnO	2.64
Al_2O_3	0.04	Fe_2O_3	6.63
SiO_2	25.55	ZrO_2	2.31
K_2O	0.63	Nb_2O_5	6.69
CaO	1.68	H_2O	17.0
		Total	100.38

(1) Mt. Kedykvyrpakhk, Lovozero alkaline massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by Raman spectroscopy, H_2O by the Penfield method; corresponds to $(Na_{1.65}Mn_{0.35}Ca_{0.28}Zr_{0.18}Mg_{0.14}K_{0.13})_{\Sigma=2.73}(Ti_{3.67}Fe^{3+}_{0.78}Nb_{0.47}Al_{0.01})_{\Sigma=4.93}[Si_4O_{19.72}]\cdot 8.87H_2O$.

Mineral Group: Seidozerite supergroup, murmanite group.

Occurrence: An accessory mineral in medium-grained trachytoid eudialyte malignite (modal $Kfs_{40}Nph_{30}Aeg_{20}Eud_{10}$) collected from drill core in a Ta-Nb-REE-Zr deposit in an alkaline massif.

Association: Murmanite, loparite-(Ce), pyrochlore, thorite, anatase, baryte, rhabdophane-(Ce), pyrrhotite, chalcopyrite, pyrite, chlorbartonite, djerfisherite, sphalerite, löllingite.

Distribution: From Mt. Kedykvyrpakhk, Lovozero alkaline massif, Kola Peninsula, Russia.

Name: Honors Ekaterina A. Selivanova (b. 1967), of the Kola Science Centre of the Russian Academy of Sciences, for her contribution to the mineralogy of alkaline complexes.

Type Material: Mineralogical Museum, St. Petersburg State University, (1/19649) and in the Geological and Mineralogical Museum, Geological Institute of the Kola Science Centre, Apatity, (GIM 7538), Russia.

References: (1) Pakhomovsky, Y.A., T.L. Panikorovskii, V.N. Yakovenchuk, G.Yu. Ivanyuk, J.A. Mikhailova, S.V. Krivovichev, V.N. Bocharov, and A.O. Kalashnikov (2018) Selivanovaite, $NaTi_3(Ti,Na,Fe,Mn)_4[(Si_2O_7)_2O_4(OH,H_2O)_4]\cdot nH_2O$, a new rock-forming mineral from the eudialyte-rich malignite of the Lovozero alkaline massif (Kola Peninsula, Russia). Eur. J. Mineral., 30(3), 525-535. (2) (2019) Amer. Mineral., 104(12), 1870-1871 (abs. ref. 1).