Komarovite $(Ca, Sr, Na)_{6-x}(Nb, Ti)_6(Si_4O_{12})(O, OH, F)_{16}\cdot nH_2O$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. Platy, foliated, massive.

Physical Properties: *Cleavage*: Perfect on {010}, fair on {001}. Hardness = 1.5-2 D(meas.) = 3.0 D(calc.) = 2.96-3.41 (Na dominant)

Optical Properties: Transparent to translucent. *Color*: Pale rose to light yellow. *Streak*: White. *Luster*: Dull.
Optical Class: Biaxial (+ or -). α = 1.750-1.809 β = 1.766-1.876 γ = 1.85-1.912
2V(meas.) = 48°-72° *Orientation*: *X* = *a*; *Y* = *c*; *Z* = *b*. *Dispersion*: *r* >> *v*.

Cell Data: *Space Group*: *Cmmm*. *a* = 7.310(1) *b* = 24.588(3) *c* = 7.402(1) Z = 2

X-ray Powder Pattern: Mt. Karnasurt, Russia.
3.16 (100), 12.2 (70), 1.783 (45), 3.118 (42), 6.35 (35), 2.740 (35), 2.715 (35)

Chemistry:

	(1)	(2)
SiO_2	23.50	17.50
TiO_2	2.50	3.34
Al_2O_3	1.00	
Fe_2O_3	1.50	
Nb_2O_5	47.00	53.98
MnO	5.00	
CaO	4.70	3.36
Na_2O	0.85	12.26
K_2O	0.30	0.15
F	1.21	3.03
H_2O	12.00	[5.25]
$- O = F_2$	0.51	1.28
Total	99.05	98.43

(1) Mt. Karnasurt, Russia. (2) Ilímaussaq alkaline complex, South Greenland; electron microprobe analysis, H_2O calculated, total includes La_2O_3 = 0.57, Ce_2O_3 = 1.11 and FeO = 0.16; corresponds to $(Na_{5.43}K_{0.04})_{\Sigma=5.47}Ca_{0.82}(Ce_{0.09}La_{0.05}Fe_{0.03})_{\Sigma=0.17}Ti_{0.57}Nb_{5.58}[Si_4O_{12}]O_{13.89}F_{2.19}\cdot 4H_2O$.

Occurrence: With late albite and redeposited fine-grained natrolite in alkalic rocks in a differentiated alkalic massif.

Association: Natrolite, albite.

Distribution: On Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia. From the Ilímaussaq alkaline complex, South Greenland.

Name: Honors the Russian cosmonaut, Vladimir Mikhailovich *Komarov* (1927-1967).

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 73302.

References: (1) Portnov, A.M., G.K. Krivokoneva, and T.I. Stolyarova (1971) Komarovite, a new niobosilicate of calcium and manganese. Zap. Vses. Mineral. Obshch., 100, 599-602 (in Russian). (2) (1972) Amer. Mineral., 57, 1315-1316 (abs. ref. 1). (3) Balić Zunić, T., O.V. Petersen, H.-J. Bernhardt, and H.I. Micheelsen (2002) The crystal structure and mineralogical description of a Na-dominant komarovite from the Ilímaussaq alkaline complex, South Greenland. Neues Jahrb. Mineral. Mon., 497-514. (4) (2003) Amer. Mineral., 88, 935 (abs. ref. 3).