

Nechelyustovite $(\text{Na}, \square)\square_2\text{Ba}_4\text{Ti}_4\text{Nb}_4(\text{Na}_{11}, \square)\text{Ti}_4(\text{Si}_2\text{O}_7)_8\text{O}_8(\text{OH})_8(\text{H}_2\text{O})_{12}$

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As rosettes to 5 cm composed of (0.01-0.1 mm) bounded flakes and lamellae elongated along [010] and flattened on (001).

Physical Properties: *Cleavage:* Perfect on {001} and good on {100}. *Tenacity:* Brittle. *Fracture:* Uneven. Hardness = 3 D(meas.) = 3.32-3.42(2), D(calc.) = 3.041

Optical Properties: Translucent to transparent. *Color:* Creamy with grayish, bluish, or yellowish shades. *Streak:* White. *Luster:* Vitreous, pearly, or silvery. *Optical Class:* Biaxial (+) pseudo-orthorhombic. $\alpha = 1.700(3)$ $\beta = 1.710(3)$ $\gamma = 1.734(3)$ $2V(\text{calc.}) = 66^\circ$ *Orientation:* $X \sim c$, $Y \sim a$, $Z \sim b$.

Cell Data: *Space Group:* $P\bar{1}$. $a = 5.447(1)$ $b = 7.157(1)$ $c = 47.259(9)$ $\alpha = 95.759(4)^\circ$ $\beta = 92.136(4)^\circ$ $\gamma = 89.978(4)^\circ$ $Z = 2$

X-Ray Diffraction Pattern: Kirovskii Mine, Mt. Kukisvumchorr, Kola Peninsula, Russia. 24.06 (100), 2.828 (42), 5.95 (36), 3.95 (25), 2.712 (19), 7.05 (13), 2.155 (13)

Chemistry:	(1)
Nb ₂ O ₅	11.43
SiO ₂	28.94
TiO ₂	19.85
Al ₂ O ₃	0.11
Fe ₂ O ₃	0.27
MnO	6.12
CaO	1.55
SrO	3.11
BaO	11.80
Na ₂ O	7.85
K ₂ O	0.84
F	1.21
H ₂ O	[8.08]
-O = F ₂	0.51
Total	100.65

(1) Kirovskii Mine, Mt. Kukisvumchorr, Khibiny massif, Russia; average electron microprobe analysis, H₂O calculated from structure; corresponds to (Na_{4.21}Mn²⁺_{1.11}Ca_{0.46}□_{1.22}) $\Sigma=7.00$ (Ba_{1.28}Sr_{0.50}K_{0.30}□_{0.92}) $\Sigma=3.00$ (Ti_{4.14}Nb_{1.43}Mn²⁺_{0.33}Fe³⁺_{0.06}Al_{0.04}) $\Sigma=6.00$ (Si_{8.03}O₂₈)O_{3.99}[(OH)_{2.94}F_{1.06}] $\Sigma=4.00$ (H₂O)_{6.01}.

Occurrence: From the natrolite core of hydrothermally altered pegmatite emplaced in nepheline syenites near their contact with ijolite-urtites.

Association: Natrolite, belovite-(La), belovite-(Ce), gaidonnayite, nenadkevichite, epididymite, fluorapophyllite, sphalerite, barytolamprophyllite.

Distribution: From the Kirovskii Mine, Mt. Kukisvumchorr. Khibiny alkaline massif, Kola Peninsula, Russia.

Name: Honors Georgii N. *Nechelyustov* (b. 1939), Russian electron microprobe analyst.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (3437/1).

References: (1) Nèmeth, P., A.P. Khomyakov, G. Ferraris, and Y.P. Menshikov (2009) Nechelyustovite, a new heterophyllosilicate mineral, and new data on bykovaite: a comparative TEM study. *Eur. J. Mineral.*, 21, 251-260. (2) Cámara, F. and E. Sokolova (2009) From structure topology to chemical composition. X. Titanium silicates: the crystal structure and crystal chemistry of nechelyustovite, a group III Ti-disilicate mineral. *Mineral. Mag.*, 73, 753-775.