

Crystal Data: Hexagonal. *Point Group:* $3m$ (*T* Type). Cubic. *Point Group:* $\bar{4} 3m$ (*C* type). As mosaic pseudocubic crystals to 2 mm; as rims to 0.5 mm around crystals and polycrystalline aggregates of sitinakite. *Twinning:* Polysynthetic {0001} twins by merohedry (*T* type).

Physical Properties: *Cleavage:* Perfect on {10 $\bar{1}$ 1} (*T* type). *Tenacity:* Brittle. *Fracture:* Stepped. Hardness = ~4 D(meas.) = 2.60 (*C* type); 2.70 (*T* type) D(calc.) = 2.39 (*C* type); 2.58 (*T* type)

Optical Properties: Transparent to translucent. *Color:* Colorless, pale brown (*T* type) or pale orange (*C* type); colorless in thin section. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Uniaxial (+). $\omega = 1.76(1)$ $\epsilon = 1.85(9)$ (*T* type). Isotropic. $n = 1.73(1)$ (*C* type).

Cell Data: *Space Group:* $R\bar{3}m$. $a = 10.921(3)$ $c = 13.885(4)$ $Z = 3$ or $P\bar{4} 3m$. 7.856(6) $Z = 1$

X-ray Powder Pattern: Koashva Quarry, Khibiny Massif, Kola Peninsula, Russia. (*T* type) 7.88 (100), 3.175 (80), 2.607 (70), 3.277 (60), 1.960 (60), 2.730 (50), 2.471 (50)

Chemistry:	(1)	(2)	(1)	(2)
Na ₂ O	7.46	5.19	MnO	0.05 0.33
Al ₂ O ₃	0.07	0.21	FeO	0.54 2.17
SiO ₂	23.75	25.47	Nb ₂ O ₅	2.99 2.90
K ₂ O	5.89	6.34	BaO	0.14
CaO	0.21	0.14	<u>H₂O</u>	<u>19.00 19.15</u>
TiO ₂	38.89	37.81	Total	98.99 99.71

(1) Koashva Quarry, Khibiny Massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, H₂O by the Penfield method; (*T* type) corresponding to (Na_{1.82}K_{0.95}Ca_{0.03}Ba_{0.01}) $\Sigma=2.81$ [(Ti_{3.68}Nb_{0.17}Fe_{0.06}Mn_{0.01}) $\Sigma=3.92$ (Si_{2.99}Al_{0.01}) $\Sigma=3.00$ O_{14.59}(OH)_{1.37}] $\cdot 7.29$ H₂O.
(2) Do.: (*C* type) corresponds to (Na_{1.17}K_{0.94}Ca_{0.03}) $\Sigma=2.14$ [(Ti_{3.32}Fe_{0.21}Nb_{0.15}Mn_{0.03}) $\Sigma=3.71$ (Si_{2.97}Al_{0.03}) $\Sigma=3.00$ O_{12.87}(OH)_{2.87}] $\cdot 6.01$ H₂O.

Polymorphism & Series: *T* and *C* polytypes.

Mineral Group: Pharmacosiderite supergroup, ivanyukite group.

Occurrence: A late-stage, hydrothermal phase in natrolitized microcline-aegirine-sodalite lens in orthoclase-bearing urtite.

Association: Microcline, vinogradovite, sazykinaite-(Y), natrolite, djerfisherite.

Distribution: From the Koashva Quarry, Koashva Mountain, Khibiny Massif, Kola Peninsula, Russia.

Name: Honors Gregory Yur'evich *Ivanyuk*, Russian mineralogist and petrologist, head of the Laboratory of Self-Organized Mineral Systems, Geological Institute, Kola Science Center, Russian Academy of Sciences, for his contributions to the petrology and mineralogy of banded iron-formations, and alkaline and alkaline-ultrabasic massifs. The suffix indicates the dominant extra-framework cation, *Na*.

Type Material: Geological and Mineralogical Museum, Geological Institute, Kola Science Center, Russian Academy of Sciences, Apatity, Russia (6353 and 6355).

References: (1) Yakovenchuk, V.N., A.P. Nikolaev, E.A. Selivanova, Y.A. Pakhomovsky, J.A. Korchak, D.V. Spiridonova, O.A. Zalkind, and S.V. Krivovichev (2009) Ivanyukite-Na-*T*, ivanyukite-Na-*C*, ivanyukite-*K*, and ivanyukite-*Cu*: New microporous titanosilicates from the Khibiny massif (Kola Peninsula, Russia) and crystal structure of ivanyukite-Na-*T*. *Amer. Mineral.*, 94, 1450-1458.