

Yuksporite $K_4(\text{Ca,Na})_{14}(\text{Sr,Ba})_2(\square,\text{Mn,Fe})(\text{Ti,Nb})_4(\text{O,OH})_4(\text{Si}_6\text{O}_{17})_2(\text{Si}_2\text{O}_7)_3(\text{H}_2\text{O,OH})_3$

Crystal Data: Monoclinic. *Point Group:* 2/m. Fibrous, scaly, or lamellar; in radial aggregates, to 10 cm.

Physical Properties: Hardness = 5 D(meas.) = 3.05(3) D(calc.) = [2.98]

Optical Properties: Semitransparent. *Color:* Rose-red to straw-yellow.

Optical Class: Biaxial (+). $\alpha = 1.644(2)$ $\beta = \text{n.d.}$ $\gamma = 1.660(2)$ $2V(\text{meas.}) = 46^\circ\text{-}76^\circ$

Pleochroism: Marked; X = pale rose-yellow; Y = Z = rose-yellow.

Cell Data: *Space Group:* $P2_1/m$. $a = 7.126(3)$ $b = 24.913(6)$ $c = 17.075(7)$ $\beta = 101.89(3)^\circ$ $Z = \text{n.d.}$

X-ray Powder Pattern: Khibiny massif, Russia.

2.778 (10), 3.00 (9), 1.786 (9), 3.10 (8), 3.05 (8), 1.888 (7), 2.92 (6)

Chemistry:	(1)	(2)		(1)	(2)
SiO ₂	40.92	38.40	BaO		8.60
TiO ₂		11.00	Na ₂ O	7.94	3.84
Al ₂ O ₃		0.07	K ₂ O	12.57	6.15
Fe ₂ O ₃	9.10	0.75	F		3.05
MnO	0.91	0.29	Cl		0.80
MgO	0.42		H ₂ O ⁺		2.20
CaO	20.56	18.90	H ₂ O	8.52	
SrO		5.87	- O = (F,Cl) ₂		1.46
			Total	100.94	[98.46]

(1) Khibiny massif, Russia. (2) Murun massif, Russia; original total given as 99.07%, corresponds to $(\text{K}_{0.70}\text{Ba}_{0.30})_{\Sigma=1.00}(\text{Na}_{0.66}\text{Sr}_{0.30})_{\Sigma=0.96}(\text{Ca}_{1.80}\text{Ti}_{0.19}\text{Fe}^{3+}_{0.06}\text{Mn}_{0.02})_{\Sigma=2.07}(\text{Si}_{3.42}\text{Ti}_{0.57}\text{Al}_{0.01})_{\Sigma=4.00}\text{O}_{11}[\text{F}_{0.86}\text{Cl}_{0.12}(\text{OH})_{0.02}]_{\Sigma=1.00}\cdot 0.6\text{H}_2\text{O}$.

Occurrence: In veins in nepheline syenite in a differentiated alkalic massif (Khibiny massif, Russia).

Association: Titanite, pectolite, astrophyllite, biotite, aegirine (Khibiny massif, Russia); aegirine, kalsilite, potassic feldspar, titanite, lamprophyllite, barium lamprophyllite, wadeite, tausonite (Murun massif, Russia).

Distribution: From the Hackmann Valley, in Yuksporlak Pass, and on the upper Vuonnemiok River, all near Mt. Yukspor, in the Khibiny massif, Kola Peninsula, and in the Murun massif, southwest of Olekminsk, Yakutia, Russia.

Name: For the localities near Mt. *Yukspor*, Kola Peninsula, Russia.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 25847.

References: (1) Fersman, A.E. (1923) [Minerals of the Khibina and Lovozero Tundras.] Trans. Northern Sc. Econ. Exped., 16, pp. 16, 52, 68, 73. (2) (1927) Amer. Mineral., 12, 58 (abs. ref. 1). (3) Kostyleva, E.E. (1925) Pectolite from Khibinsky tundra. Bull. Acad. Sci. Russie, 19, 383-404 (in Russian). (4) (1928) Mineral. Abs., 3, 111 (abs. ref. 3). (5) Konev, A.A., Y.I. Vorob'ev, A.N. Sapozhnikov, Y.U. Malyshonok, L.F. Paradina, and I.L. Lapidus (1985) New data on yuksporite. Mineral. Zhurnal, 7(4), 74-78 (in Russian). (6) Krivovichev, S.V., V.N. Yakovenchuk, T. Armbruster, N. Döbelin, P. Pattison; H.-P. Weber, and W. Depmeier (2004) Porous titanosilicate nanorods in the structure of yuksporite, $(\text{Sr,Ba})_2\text{K}_4(\text{Ca,Na})_{14}(\square,\text{Mn,Fe})\{(\text{Ti,Nb})_4(\text{O,OH})_4[\text{Si}_6\text{O}_{17}]_2[\text{Si}_2\text{O}_7]_3\}(\text{H}_2\text{O,OH})_n$, resolved using synchrotron radiation. Amer. Mineral., 89(10), 1561-1565.