

Tsepinite-K**(K, Ba, Na)₂(Ti, Nb)₂(Si₄O₁₂)(OH, O)₂·3H₂O**

Crystal Data: Monoclinic. *Point Group:* *m*. Prismatic crystals to 0.4 mm, display { $\bar{2}$ 01}, {001}, {010}, and {100}. Can be epitaxial around nenadkevichite and elpidite.

Physical Properties: *Cleavage:* Imperfect. *Fracture:* [Uneven.] *Tenacity:* Brittle. Hardness = 5
D(meas.) = 2.88(3) D(calc.) = 2.97

Optical Properties: Transparent. *Color:* Colorless to white and pale brown. *Streak:* [White.]
Luster: Vitreous.

Optical Class: Biaxial (+). $\alpha = 1.690(3)$ $\beta = 1.701(3)$ $\gamma = 1.800(5)$ $2V(\text{meas.}) = 25^\circ\text{-}40^\circ$

Cell Data: *Space Group:* *Cm*. $a = 14.327(3)$ $b = 13.802(2)$ $c = 7.783(1)$ $\beta = 116.95(1)^\circ$ $Z = 4$

X-ray Powder Pattern: Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia.
6.87 (100), 2.56 (90), 3.05 (80), 3.20 (60), 3.00 (60), 4.85 (50), 3.95 (50)

Chemistry:	(1)
Na ₂ O	2.14
K ₂ O	6.54
BaO	11.28
MnO	1.15
FeO	0.37
SiO ₂	38.86
TiO ₂	21.47
Nb ₂ O ₅	7.05
<u>H₂O</u>	<u>10.34</u>
Total	99.20

(1) Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, H₂O by TGA; corresponds to (K_{0.86}Ba_{0.46}Na_{0.43}Mn_{0.10}) $\Sigma=1.85$ (Ti_{1.66}Nb_{0.33}Fe³⁺_{0.03}) $\Sigma=2.02$ Si₄O₁₂(OH)_{1.21}O_{0.79}·2.94H₂O.

Mineral Group: Labuntsovite group, vuoriyarvite subgroup.

Occurrence: In cavities formed by hydrothermal alteration of alkaline pegmatite.

Association: Other labunstovite-group minerals, aegirine, manganneptunite, natrolite, chabazite-Ca, yofortierite, nontronite, kaolinite-group minerals; pseudomorphous after murmanite.

Distribution: From Mt. Kukisvumchorr and Mt. Eveslogchorr, Khibiny alkaline complex, and Mt. Karnasurt, Lovozero alkaline massif, Kola Peninsula, Russia.

Name: Suffix indicates the K-dominant analog of *tsepinite*-Na and *tsepinite*-Ca.

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

References: (1) Chukanov, N.V., I.V. Pekov, A.E. Zadov, K.A. Rozenberg, R.K. Rastsvetaeva, and S.V. Krivovichev, (2003) The new minerals tsepinite-K, (K,Ba,Na)₂(Ti,Nb)₂(Si₄O₁₂)(OH,O)₂·3H₂O, and paratsepinite-Ba, (Ba,Na,K)_{2-x}(Ti,Nb)₂(Si₄O₁₂)(OH,O)₂·4H₂O, and their relationships with other representatives of the labuntsovite group. Zapiski VMO (Proc. Russ. Miner. Soc.), 132(1), 38-51 (in Russian). (2) (2004) Amer. Mineral., 89(5-6), 895-896 (abs. ref. 1). (3) Chukanov, N.V., I.V. Pekov, and A.P. Khomyakov (2002) Recommended nomenclature for labuntsovite group minerals. Eur. J. Mineral., 14, 165-173.