Tsepinite-Na $(Na, H_3O, K, Sr, Ba, \square)_2(Ti, Nb)_2(Si_4O_{12})(OH, O)_2 \cdot 3H_2O$

Crystal Data: Monoclinic. *Point Group*: *m.* In radial aggregates; as prismatic crystals to 1, showing {001}, {010}, {100}, and {$\bar{2}$ 01}, with some modified by {012} and {$\bar{2}$ 41}.

Physical Properties: *Cleavage:* None. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = 5
D(meas.) = 2.74(2) D(calc.) = 2.72(1)

Optical Properties: Transparent to translucent. *Color*: Colorless to white and pale brown.
Streak: White. *Luster*: Vitreous.
Optical Class: Biaxial (+). α = 1.655(2)-1.658(1) β = 1.661(2)-1.668(1) γ = 1.770(5)
2V(meas.) = 19°-31° Nonpleochroic.

Cell Data: *Space Group*: *Cm.* a = 14.604(7) b = 14.274(8) c = 7.933(2) β = 117.40(3)° Z = 4

X-ray Powder Pattern: Mt. Khibinpakhchorr, Khibiny complex, Kola Peninsula, Russia.
7.09 (100), 3.24 (90), 3.15 (80), 2.54 (70), 4.98 (60), 2.63 (60), 2.06 (60)

Chemistry:

	(1)
Na_2O	5.48
K_2O	1.58
BaO	2.60
CaO	0.18
SrO	2.32
ZnO	0.04
Fe_2O_3	0.25
SiO_2	40.38
TiO_2	14.17
Nb_2O_5	20.69
H_2O	13.18
Total	100.87

(1) Mt. Khibinpakhchorr, Khibiny complex, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, H_2O by TGA; corresponds to $(Na_{4.21}K_{0.80}Sr_{0.54}Ba_{0.41}Ca_{0.08}Zn_{0.01})_{\Sigma=6.05}(Ti_{4.22}Nb_{3.71}Fe^{3+}_{0.07})_{\Sigma=8.00}Si_{16}O_{70.78}H_{34.83}$.

Mineral Group: Labuntsovite group, vuoriyarvite subgroup.

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

Association: Microcline, aegirine, analcime, natrolite, catapleiite, apophyllite, labuntsovite-Mn (Mt. Khibinpakhchorr); microcline, aegirine, magnesio-arfvedsonite, natrolite, eudialyte, lamprophyllite, neptunite, polylithionite (Mt. Lepkhe-Nelm).

Distribution: From Mt. Khibinpakhchorr, Khibiny alkaline complex, and Mt. Lepkhe-Nelm, Lovozero massif, Kola Peninsula, Russia.

Name: Honors Russian microprobe analyst Anatoliy I. Tsepin (b. 1946) and the suffix indicates the Na-dominant analog of *tsepinite*-K and *tsepinite*-Ca.

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

References: (1) Shlyukova, Z.V., N.V. Chukanov, I.V. Pekov, R.K. Rastsvetaeva, N.I. Organova, and A.E. Zadov (2001) Tsepinite-Na $(Na,H_3O,K,Sr,Ba)_2(Ti,Nb)_2[Si_4O_{12}](OH,O)_2 \cdot 3H_2O$, a new mineral of the labuntsovite group. Zapiski VMO, (Proc. Russ. Miner. Soc.), 130(3), 43-50 (in Russ.) (2) (2002) Amer. Mineral., 87, 1734 (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.