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

**Crystal Data**: Monoclinic. *Point Group*: *m.* As prismatic crystals elongated along [010], to 3 mm; as crusts to 5 mm.

**Physical Properties**: *Cleavage:* None. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = 5 D(meas.) = 2.67(2) D(calc.) = 2.63 Nonfluorescent.

**Optical Properties**: Transparent to translucent. *Color*: Colorless to white, pale brown; colorless in transmitted light. *Streak*: White. *Luster*: Vitreous.
*Optical Class*: Biaxial (+). $\alpha = 1.649(2)$ $\beta = 1.651(2)$ $\gamma = 1.770(4)$ 2V(meas.) = 20(5)° 2V(calc.) = 16° *Dispersion*: Very weak, $r < v$. *Orientation*: $Y = b$.

**Cell Data**: *Space Group*: *Cm.* $a = 14.490(3)$ $b = 14.23(1)$ $c = 7.881(3)$ $\beta = 117.28(2)°$ $Z = 4$

**X-ray Powder Pattern**: Mt. Eveslogchorr, Khibiny complex, Kola Peninsula, Russia.
3.230 (100), 7.10 (90), 3.135 (80), 2.510 (80), 6.45 (50), 1.728 (50), 1.570 (45)

**Chemistry**:

| | (1) |
|---|---|
| $Na_2O$ | 0.61 |
| $K_2O$ | 1.30 |
| BaO | 4.27 |
| CaO | 0.92 |
| MgO | 0.01 |
| MnO | 0.05 |
| SrO | 5.12 |
| ZnO | 0.26 |
| FeO | 0.08 |
| $Al_2O_3$ | 0.18 |
| $SiO_2$ | 41.89 |
| $TiO_2$ | 18.49 |
| $Nb_2O_5$ | 16.07 |
| $H_2O$ | 11.14 |
| Total | 100.39 |

(1) Mt. Eveslogchorr, Khibiny complex, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, $H_2O$ by TGA; corresponds to $(Sr_{0.28}Ba_{0.16}K_{0.16}Na_{0.11}Ca_{0.09}Zn_{0.02})_{\Sigma=0.82}(Ti_{1.32}Nb_{0.69}Fe_{0.01})_{\Sigma=2.02}(Si_{3.98}Al_{0.02})_{\Sigma=4}O_{12}[(OH)_{1.89}O_{0.11}]_{\Sigma=2.00} \cdot 2.59H_2O$.

**Mineral Group**: Labuntsovite group, vuoriyarvite subgroup.

**Occurrence**: In cavities formed by hydrothermal alteration of nepheline-syenite pegmatite.

**Association**: Microcline, albite, natrolite, analcime, aegirine, eudialyte, leifite, vuoriyarvite-K, tsepinite-Ca, kuzmenkoite-Zn, paratsepinite-Ba, takanelite. As zones in tsepinite-Na; epitactial on labuntsovite; encrusting lamprophyllite and eudialyte.

**Distribution**: From Mt. Eveslogchorr and Mt. Khibinpakhkchorr, Khibiny alkaline massif, and Mt. Lepkhe-Nel'm, Lovozero massif, Kola Peninsula, Russia.

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

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

**References**: (1) Pekov, I.V., N.V. Chukanov, A.E. Zadov, K.A. Rozenberg, and R.K. Rastsvetaeva (2005) Tsepinite-Sr, $(Sr,Ba,K)(Ti,Nb)_2((Si_4O_{12})(OH,O)_2 \cdot 3H_2O$, a new mineral of the labuntsovite group. New Data on Minerals, 40, 11-16. (2) Chukanov, N.V., I.V. Pekov, and A.P. Khomyakov (2002) Recommended nomenclature for labuntsovite group minerals. Eur. J. Mineral., 14, 165-173.