Lepkhenelmite-Zn $Ba_2Zn(Ti,Nb)_4[Si_4O_{12}]_2(O,OH)_4 \cdot 7H_2O$

Crystal Data: Monoclinic. *Point Group: m.* As length-striated, flattened prismatic crystals, elongated on [010], to 7 mm, displaying {100} and {001}. In sheaf-like aggregates.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = ~5 D(meas.) = 2.96 D(calc.) = 3.07

Optical Properties: Transparent. *Color:* Light brown. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (+). α = 1.683(2) β = 1.692(2) γ = 1.795(4) 2V(obs.) = 30(10)° 2V(calc.) = 34.5° *Pleochroism:* Weak, *X* = *Z* = colorless; *Y* = pale yellowish-brown. *Orientation: Y = b*. *Dispersion:* None.

Cell Data: Space Group: *Cm*. *a* = 14.381(3) *b* =13.889(3) *c* = 7.793(2) β = 117.52(3)° *Z* =2

X-ray Powder Pattern: Pegmatite no. 45, Mount Lepkhe-Nel'm, Lovozero massif, Russia. 3.194 (100), 6.95 (37), 3.101 (22), 6.39 (10), 3.050 (8), 2.906 (6), 2.585 (6)

Chemistry:

	(1)		(1)
Na_2O	0.59	ZnO	3.66
K_2O	1.98	Al_2O_3	0.42
CaO	1.16	SiO_2	37.01
SrO	1.79	TiO_2	18.56
BaO	11.04	Nb_2O_5	10.60
MgO	0.02	H_2O	11.80
MnO	0.81	Total	99.65
FeO	0.21		

(1) Pegmatite no. 45, Mount Lepkhe-Nel'm, Lovozero massif, Russia; electron microprobe analyses, H_2O by TGA; corresponding to $(Ba_{0.92}K_{0.54}Ca_{0.26}Na_{0.24}Sr_{0.22})_{\Sigma=2.18}(Zn_{0.58}Mn_{0.15}Fe_{0.04}Mg_{0.01})_{\Sigma=0.78}(Ti_{2.97}Nb_{1.02})_{\Sigma=3.99}(Si_{7.89}Al_{0.11})_{\Sigma=8.00}O_{24}[O_{2.01}(OH)_{1.99}]_{\Sigma=4.00} \cdot 7.39H_2O$.

Polymorphism & Series: Forms a series with kuzmenkoite-Zn.

Mineral Group: Labuntsovite group.

Occurrence: A late-stage hydrothermal mineral in a complex granitic (eudialite, agerine, feldspar) pegmatite.

Association: Lamprophyllite, eudialyte, tsepinite-Na, kuzmenkoite-Zn, paratsepinite-Ba.

Distribution: From Pegmatite no. 45, north slope of Mount Lepkhe-Nel'm, Lovozero massif, Kola peninsula, Russia.

Name: For the locality that produced the first specimens and the dominant element in the D structural site, Zn.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Science, Moscow, Russia; 2709/1.

References: (1) Pekov, I.V., N.V., Chukanov, G.V., Shilov, N.N.,Kononkova, and A.E., Zadov, (2004) Lepkhenelmite-Zn, $Ba_2Zn(Ti,Nb)_4[Si_4O_{12}]_2(O,OH)_4 \cdot 7H_2O$, a new mineral of the labuntsovite group, and its crystal structure. Zapiski Vseross. Mineral. Obshch., 133(1), 49-58 (in Russian, English abstract). (2) (2005) Amer. Mineral., 90, 769-770 (abs. ref. 1).