

**Penkviksite****Na<sub>4</sub>Ti<sub>2</sub>Si<sub>8</sub>O<sub>22</sub>•5H<sub>2</sub>O**

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**Crystal Data:** Monoclinic or orthorhombic. *Point Group:* n.d. Crystal plates, to 7 μm and very thin, and microscopic radial fibrous masses, in lumps and clotted masses, to 3 cm; compact, porcelaneous.

**Physical Properties:** *Cleavage:* One perfect, probably basal. Hardness = 5, in aggregate. D(meas.) = 2.58(2) D(calc.) = n.d.

**Optical Properties:** Transparent to translucent. *Color:* White to pale gray, brownish, or greenish. *Luster:* Pearly or silky on fresh fracture; dull on the surface.

*Optical Class:* Biaxial (+). α = 1.637(2) β = 1.640(2) γ = 1.662(2) 2V(meas.) = n.d. 2V(calc.) = 42°

**Cell Data:** *Space Group:* n.d. a = 7.48(5) b = 8.77(5) c = n.d. α = n.d. β = n.d. γ = 90° Z = n.d.

**X-ray Powder Pattern:** Lovozero massif, Russia.

8.2 (10), 3.37 (9), 2.84 (8), 3.32 (7), 3.10 (7), 3.07 (7), 1.713 (7)

**Chemistry:**

	(1)		(1)
SiO <sub>2</sub>	54.69	CaO	1.60
TiO <sub>2</sub>	15.91	SrO	0.01
ZrO <sub>2</sub>	2.17	Na <sub>2</sub> O	13.13
Al <sub>2</sub> O <sub>3</sub>	0.76	K <sub>2</sub> O	0.09
Fe <sub>2</sub> O <sub>3</sub>	0.19	F	0.05
Nb <sub>2</sub> O <sub>5</sub>	1.08	H <sub>2</sub> O <sup>+</sup>	7.43
Ta <sub>2</sub> O <sub>5</sub>	0.06	H <sub>2</sub> O <sup>-</sup>	2.84
MnO	0.01	P <sub>2</sub> O <sub>5</sub>	0.02
MgO	trace	-O = F <sub>2</sub>	0.02
		Total	100.02

(1) Lovozero massif, Russia; corresponds to (Na<sub>3.7</sub>Ca<sub>0.3</sub>)<sub>Σ=4.0</sub>[Ti<sub>1.7</sub>Zr<sub>0.2</sub>(Nb, Fe, Al)<sub>0.1</sub>]<sub>Σ=2.0</sub>(Si<sub>7.9</sub>Al<sub>0.1</sub>)<sub>Σ=8.0</sub>O<sub>22</sub>•5H<sub>2</sub>O.

**Occurrence:** In the central natrolite zone of a pegmatite in a differentiated alkalic massif (Lovozero massif, Russia); in a pegmatite vein and in a marble xenolith in an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada).

**Association:** Aegirine, natrolite, mountainite, raite (Lovozero massif, Russia); microcline, aegirine, catapleiite, ancylite, nenadkevichite, pectolite, apophyllite, monteregianite, vesuvianite, tadzhikite (Mont Saint-Hilaire, Canada).

**Distribution:** From the Jubilee pegmatite, on Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia. At Mont Saint-Hilaire, Quebec, Canada.

**Name:** From the Lapp *penk*, for *curly*, and *vilkis*, for *white*, for its typical appearance.

**Type Material:** Geology Museum, Kola Branch, Academy of Sciences, Apatity, 3244, 3781; Mining Institute, St. Petersburg, 1065/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 75126; National School of Mines, Paris, France; The Natural History Museum, London, England, 1994,24.

**References:** (1) Bussen, I.V., Y.P. Men'shikov, A.M. Mer'kov, A.P. Nedorezova, E.I. Uspenskaya, and A.P. Khomyakov (1974) Penkviksite, a new hydrosilicate of titanium and sodium. Doklady Acad. Nauk SSSR, 217, 1161–1164 (in Russian). (2) (1975) Amer. Mineral., 60, 340–341 (abs. ref. 1). (3) Horváth, L. and R.A. Gault (1990) The mineralogy of Mont Saint-Hilaire, Quebec. Mineral. Record, 21, 283–359, esp. 329.

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