Malinkoite $NaBSiO_4$

Crystal Data: Hexagonal. *Point Group*: 6. As wedge shaped prismatic crystals to 0.5 mm in rosettes to 3 mm.

Physical Properties: *Cleavage*: Moderate on {h00} and {001}. *Tenacity*: Brittle. *Fracture*: Stepped to hackly. Hardness = 7 D(meas.) = 2.85(2)-2.90(2) D(calc.) = 2.922

Optical Properties: Translucent (turbid) to transparent. *Color:* White with creamy rose tint, pale rose or greenish blue. *Streak*: White. *Luster*: Vitreous, spherulites are pearly or silky. *Optical Class*: Uniaxial (-). ε = 1.582(2) ω = 1.591(2)

Cell Data: *Space Group*: $P6_3$. a = 13.8964(4) c = 7.7001(2) Z = 18

X-ray Powder Pattern: Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia. 2.780 (100), 2.216 (90), 2.320 (70), 1.721 (70), 3.86 (60) 3.61 (60), 1.928 (50)

Chemistry:

	(1)	(2)
SiO_2	47.83	47.73
B_2O_3	26.88	27.65
K_2O	0.00	
Na_2O	24.36	47.83
Total	99.07	100.00

(1) Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy; corresponds to $Na_{1.00}B_{0.98}Si_{1.01}O_4$. (2) $NaBSiO_4$.

Mineral Group: Zeolite group.

Occurrence: In a cavity in the ussingite-rich core of a hyperagpaitic pegmatite.

Association: Ussingite, chkalovite, nordite, gerasimovskite, neptunite.

Distribution: From Mt. Karnasurt [TL] and Mt. Alluaiv, Lovozero massif, Kola Peninsula, Russia. At Mont Saint-Hilaire, Quebec, Canada.

Name: Honors Russian specialist in boron minerals, Svetlana V. *Malinko* (b. 1927).

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

References: (1) Khomyakov, A.P., G.N. Nechelyustov, E.V. Sokolova, and F.C. Hawthorne (2000) The new borosilicates malinkoite, $NaBSiO_4$, and lisitsynite, $KBSi_2O_6$, from the alkaline pegmatites of the Khibiny-Lovozero complex (Kola Peninsula). Zapiski Vseross. Mineral. Obshch., 129(6), 35-42 (in Russian, English abs.). (2) (2002) Amer. Mineral., 87, 181 (abs. ref. 1). (3) Sokolova, E.V., F.C. Hawthorne, and A.P. Khomyakov (2001) The crystal chemistry of malinkoite, $NaBSiO_4$, and lisitsynite, $KBSi_2O_6$, from the Khibina-Lovozero massif, Kola Peninsula, Russia. Can. Mineral., 39(1), 159-169. (4) Graetsch, H.A. and W. Schreyer (2005) Rietveld refinement of synthetic monoclinic $NaBSiO_4$. Can. Mineral., 43(2), 759-767.