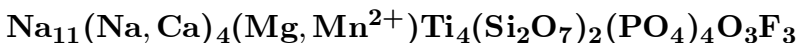


**Sobolevite**

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**Crystal Data:** Triclinic. *Point Group:* 1. As platy masses to 5 mm, flattened on {001}.**Physical Properties:** *Cleavage:* Perfect on {001}, distinct on {110}. *Hardness* = ~4.5–5  
VHN = 342–712 *D*(meas.) = 3.03 *D*(calc.) = 3.03**Optical Properties:** Semitransparent. *Color:* Brown. *Luster:* Metallic, resinous, or pearly on (001).*Optical Class:* Biaxial (-). *Pleochroism:* X = nearly colorless; Y = Z = yellowish brown.*Orientation:* X = b; Y = a; X  $\wedge$  c = 32°. *Dispersion:* r < v, strong. *Absorption:* Z = Y > X.  
 $\alpha = 1.627(2)$   $\beta = 1.686(2)$   $\gamma = 1.690(2)$  *2V*(meas.) = 25°–33°**Cell Data:** *Space Group:* P1. *a* = 7.078(1) *b* = 5.4115(7) *c* = 40.618(10)  $\alpha = 90.01(2)^\circ$   
 $\beta = 93.19(2)^\circ$   $\gamma = 90.00(1)^\circ$  *Z* = 2**X-ray Powder Pattern:** Mt. Alluaiv, Russia.

2.896 (100), 2.691 (70), 2.913 (50), 1.771 (50), 1.671 (50), 3.18 (40), 1.717 (35)

**Chemistry:**

	(1)
SiO <sub>2</sub>	17.1
TiO <sub>2</sub>	15.2
Fe <sub>2</sub> O <sub>3</sub>	0.6
Nb <sub>2</sub> O <sub>5</sub>	4.4
MnO	4.0
MgO	0.6
CaO	6.4
Na <sub>2</sub> O	29.7
F	0.7
P <sub>2</sub> O <sub>5</sub>	19.9
–O = F <sub>2</sub>	0.3
Total	98.3

(1) Mt. Alluaiv, Russia; by electron microprobe, average of four samples; corresponds to  
(Na<sub>13.47</sub>(Ca<sub>1.60</sub>)<sub>Σ=15.07</sub>(Mn<sub>0.79</sub>Mg<sub>0.21</sub>Fe<sub>0.11</sub>)<sub>Σ=1.11</sub>(Ti<sub>2.67</sub>Nb<sub>0.46</sub>)<sub>Σ=3.13</sub>P<sub>3.94</sub>Si<sub>4.00</sub>O<sub>33.19</sub>F<sub>0.52</sub>·**Occurrence:** In alkalic pegmatite, cutting sodalite-cancrinite syenite, in a differentiated alkalic massif.**Association:** Lamprophyllite, lomonosovite.**Distribution:** On Mt. Alluaiv, Lovozero massif, Kola Peninsula, Russia.**Name:** For Academician Vladimir Stepanovich Sobolev (1908–1982), Russian mineralogist, petrologist, and former President of the International Mineralogical Association, Institute of Geology and Geophysics, Novosibirsk, Russia.**Type Material:** Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5778/2; Mining Institute, St. Petersburg, 1303/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 82754.**References:** (1) Khomyakov, A.P., T.A. Kurova, and N.I. Chistyakova (1983) Sobolevite, Na<sub>14</sub>Ca<sub>2</sub>MnTi<sub>3</sub>P<sub>4</sub>Si<sub>4</sub>O<sub>34</sub>, a new mineral. *Zap. Vses. Mineral. Obshch.*, 112, 456–461 (in Russian). (2) (1984) *Amer. Mineral.*, 69, 813 (abs. ref. 1). (3) (1987) *Amer. Mineral.*, 72, 1279 (errata ref. 2). (4) (1988) Sokolova, E.V., Y.K. Yegorov-Tismenko, and A.P. Khomyakov (1988) Crystal structure of sobolevite. *Doklady Acad. Nauk SSSR*, 302, 1112–1118 (in Russian). (5) (1991) *Amer. Mineral.*, 76, 305 (abs. ref. 4).

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