

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As rims around lazurite to 3 mm thick, as veinlets in lazurite or in granular aggregates to 4 mm, rarely to 2 cm.

Physical Properties: *Cleavage:* Distinct on {010}. *Fracture:* Stepped. *Tenacity:* Brittle. Hardness = 5-5.5 VHN = 575 (50 g load) D(meas.) = 2.48(3) D(calc.) = 2.436

Optical Properties: Translucent. *Color:* Dark blue to ink-blue, light blue or greenish-blue. *Streak:* Blue. *Luster:* Vitreous to greasy. *Optical Class:* Biaxial (-). $\alpha = 1.502-1.507$ $\beta = 1.509-1.514$ $\gamma = 1.512-1.517$ $2V(\text{meas}) = 63(1)^\circ$ $2V(\text{calc}) = 66^\circ$ *Pleochroism:* Light to dark blue. *Absorption:* $Z = Y > X$.

Cell Data: *Space Group:* Pnaa. $a = 9.053(3)$ $b = 12.837(3)$, $c = 38.445(10)$ $Z = 6$

X-ray Powder Pattern: Tultuy deposit, Irkutsk region, Russia. 3.71 (100), 2.623 (30), 2.141 (14), 2.875 (12), 6.43 (11), 1.783 (9), 2.428 (6)

Chemistry:	(1)
SiO ₂	32.59
Al ₂ O ₃	27.39
CaO	7.66
Na ₂ O	17.74
K ₂ O	<0.04
SO ₃	11.37
S	1.94
Cl	0.12
H ₂ O	1.0
-O = Cl	0.03
<u>-O = S</u>	<u>0.16</u>
Total	99.62

(1) Tultuy deposit, Irkutsk region, Russia; average of 15 electron microprobe analyses, H₂O by TGA, S by wet chemistry, S₃⁻ radical confirmed by Raman spectra; corresponding to $\text{Na}_{6.36}\text{Ca}_{1.52}(\text{Si}_{6.03}\text{Al}_{5.97})_{\Sigma=12}\text{O}_{23.99}(\text{SO}_4)_{1.58}(\text{S}_3)_{0.17}(\text{S}_2)_{0.08}\text{Cl}_{0.04} \cdot 0.62\text{H}_2\text{O}$.

Mineral Group: Sodalite group.

Occurrence: In highly metamorphosed rocks of granulite facies at the contacts of dolomitic marbles with granites.

Association: Lazurite, calcite, afghanite, tounkite, phlogopite, marialite.

Distribution: From the Lyajvardara lazurite deposit, South-Western Pamir, Tajikistan; at the Tultuy lazurite deposit, South-West of Lake Baikal, Irkutsk region, Russia.

Name: Honors Russian mineralogist and geochemist Vladimir Georgievich Ivanov (1947-2002).

Type Material: Mineralogical Museum, Saint Petersburg State University, Russia.

References: (1) Sapozhnikov, A.N., E.V. Kaneva, D.I. Cherepanov, L.F. Suvorova, V.I. Levitsky, L.A. Ivanova, and L.Z. Reznitsky (2011) Vladimirivanovite, $\text{Na}_6\text{Ca}_2[\text{Al}_6\text{Si}_6\text{O}_{24}](\text{SO}_4, \text{S}_3, \text{S}_2, \text{Cl})_2 \cdot \text{H}_2\text{O}$ - a new mineral of the sodalite group. Zap. Ross. Mineral. Obsch., 140(5), 36-45 (in Russian, English abstract). (2) (2013) Amer. Mineral., 98, 814-815 (abs. ref. 1).