

Crystal Data: Monoclinic. *Point Group:* $2/m$. As prismatic crystals to 2 mm.

Physical Properties: *Cleavage:* Perfect on $\{110\}$. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 5 D(meas.) = 2.69(2) D(calc.) = 2.713

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (+). $\alpha = 1.563(2)$ $\beta = 1.565(2)$ $\gamma = 1.577(2)$ $2V(\text{meas.}) = 42(3)^\circ$ $2V(\text{calc.}) = 45^\circ$ *Dispersion:* Strong; $r > v$.

Cell Data: Space Group: $C2/m$. $a = 14.5975(4)$ $b = 14.1100(4)$ $c = 14.4394(4)$ $\beta = 90.0399(4)^\circ$ $Z = 8$

X-ray Powder Pattern: Darai-Pioz glacier, Tien-Shan Mountains, Tajikistan. 7.05 (100), 3.24 (96), 3.10 (69), 5.13 (53), 6.51 (42), 3.17 (34), 2.941 (27)

Chemistry:	(1)
Nb ₂ O ₅	0.39
SiO ₂	58.84
ZrO ₂	16.55
HfO ₂	0.30
FeO	0.01
Y ₂ O ₃	3.05
Cs ₂ O	2.58
K ₂ O	0.95
Na ₂ O	8.91
<u>H₂O</u>	<u>[7.40]</u>
Total	98.98

(1) Darai-Pioz glacier, Tien-Shan Mountains, Tajikistan; average of 10 electron microprobe analyses supplemented by FTIR spectroscopy, H₂O calculated from structure; corresponding to $(\text{Na}_{1.76}\text{K}_{0.12}\text{Cs}_{0.11})_{\Sigma=1.99}(\text{Zr}_{0.82}\text{Y}_{0.17}\text{Nb}_{0.02}\text{Hf}_{0.01})_{\Sigma=1.02}(\text{Si}_{6.01}\text{O}_{14.98})(\text{H}_2\text{O})_{2.52}$.

Polymorphism & Series: Dimorph of elpidite.

Occurrence: In glacial moraine derived from an alkaline igneous complex.

Association: Reedmergnerite, quartz, pectolite, zeravshanite, mendeleevite-(Ce), fluorite, leucosphenite, a pyrochlore-group mineral, neptunite, telyushenkoite, moskvinite-(Y), shibkovite.

Distribution: From the Darai-Pioz glacier, upper reaches of the Darai-Pioz River, Alaisky mountain ridge, Tien-Shan Mountains, Tajikistan.

Name: Honors Rustam Gumirovich Yusupov (b. 1935), a Uzbek mineralogist and curator at the Geological Museum, Tashkent, Uzbekistan.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4543/1).

References: (1) Agakhanov, A.A., L.A. Pautov, V.Y. Karpenko, E. Sokolova, Y.A. Abdu, F.C. Hawthorne, I.V. Pekov, and O.I. Siidra (2015) Yusupovite, $\text{Na}_2\text{Zr}(\text{Si}_6\text{O}_{15})(\text{H}_2\text{O})_3$, a new mineral species from the Darai-Pioz alkaline massif and its implications as a new microporous filter for large ions. *Amer. Mineral.*, 100, 1052-1508.