

Arapovite**(U,Th)(Ca,Na)₂(K_{1-x}□_x)Si₈O₂₀•H₂O**

Crystal Data: Tetragonal. *Point Group:* 4/m 2/m 2/m. As zones to 0.3 mm in turkestanite crystals.

Physical Properties: *Cleavage:* None. *Fracture:* Conchoidal. *Tenacity:* n.d.
Hardness = 5.5-6 VHN = 682-766 (100 g load). D(meas.) = 3.43(2) D(calc.) = 3.365
Partially metamict.

Optical Properties: Transparent. *Color:* Dark green. *Streak:* n.d. *Luster:* Vitreous and pitchy.
Optical Class: Uniaxial (-). $\omega = 1.615(2)$ $\epsilon = 1.610(2)$

Cell Data: Space Group: *P4/mcc*. $a = 7.5505(4)$ $c = 14.7104(9)$ $Z = 2$

X-ray Powder Pattern: Dara-i-Pioz glacier, Tien-Shan mountains, Garm region, Tajikistan.
3.37 (100), 2.640 (64), 3.31 (58), 2.161 (45), 5.28 (38), 1.644 (30), 2.016 (29)

Chemistry:	(1)		(1)
SiO ₂	53.99	Eu ₂ O ₃	0.14
UO ₂	16.63	Gd ₂ O ₃	0.03
ThO ₂	10.57	Dy ₂ O ₃	0.13
Ce ₂ O ₃	0.55	PbO	0.82
La ₂ O ₃	0.14	CaO	8.11
Pr ₂ O ₃	0.05	Na ₂ O	2.54
Nd ₂ O ₃	0.62	K ₂ O	4.52
Sm ₂ O ₃	0.11	<u>H₂O</u>	<u>1.80</u>
		Total	100.76

(1) Dara-i-Pioz glacier, Tien-Shan mountains, Garm region, Tajikistan; average of 6 electron microprobe analyses supplemented by Raman spectroscopy, H₂O by Penfield method; corresponds to (U_{0.55}Th_{0.36}Pb_{0.03}Ce_{0.03}Nd_{0.03}La_{0.01}Sm_{0.01}Eu_{0.01}Dy_{0.01}) $\Sigma=1.04$ (Ca_{1.29}Na_{0.73}) $\Sigma=2.02$ (K_{0.85}□_{0.15}) $\Sigma=1.00$ Si₈O_{20.06}•0.89H₂O.

Polymorphism & Series: Forms a series with turkestanite.

Occurrence: As dark green zones in turkestanite crystals in a glacial cobble in moraine rich in alkaline rock fragments.

Association: Microcline, aegirine, polyolithionite, stillwellite-(Ce), turkestanite.

Distribution: From the moraine of the Dara-i-Pioz glacier, Alai mountain ridge, Tien-Shan mountains, Garm region, northern Tajikistan.

Name: Honors Yu. A. Arapov (1907-1988), geologist and author of many works on the geochemistry, mineralogy and petrology of Middle Asia.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia.

References: (1) Agakhanov, A.A., L.A. Pautov, Y.A. Uvarova, E.V. Sokolova, F.C. Hawthorne, V. Yu. Karpenko, V.D. Dusmatov, and E.I. Semenov (2004) Arapovite, (U,Th)(Ca,Na)₂(K_{1-x}□_x) Si₈O₂₀•H₂O. *New mineral. New Data on Minerals (Moscow)*, 39, 14-19. (2) Y.A. Uvarova, E. Sokolova, F.C. Hawthorne, A.A. Agakhanov, and L.A. Pautov (2004) The crystal structure of arapovite, U⁴⁺(Ca,Na)₂(K_{1-x}□_x)[Si₈O₂₀], $x \approx 0.5$, a new mineral species of the steacyite group from the Dara-i-Pioz moraine, Tien-Shan mountains, Tajikistan. *Can. Mineral.*, 42, 1005-1011. (3) (2006) *Amer. Mineral.*, 91, 216 (abs. refs. 1 & 2).