

**Arapovite**

**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).  $D(\text{meas.}) = 3.43(2)$   $D(\text{calc.}) = 3.365$   
Partially metamict.

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

**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 <sub>2</sub>	53.99	Eu <sub>2</sub> O <sub>3</sub>	0.14
UO <sub>2</sub>	16.63	Gd <sub>2</sub> O <sub>3</sub>	0.03
ThO <sub>2</sub>	10.57	Dy <sub>2</sub> O <sub>3</sub>	0.13
Ce <sub>2</sub> O <sub>3</sub>	0.55	PbO	0.82
La <sub>2</sub> O <sub>3</sub>	0.14	CaO	8.11
Pr <sub>2</sub> O <sub>3</sub>	0.05	Na <sub>2</sub> O	2.54
Nd <sub>2</sub> O <sub>3</sub>	0.62	K <sub>2</sub> O	4.52
Sm <sub>2</sub> O <sub>3</sub>	0.11	<u>H<sub>2</sub>O</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, H<sub>2</sub>O by Penfield method; corresponds to  $(U_{0.55}Th_{0.36}Pb_{0.03}Ce_{0.03}Nd_{0.03}La_{0.01}Sm_{0.01}Eu_{0.01}Dy_{0.01})_{\Sigma=1.04}(Ca_{1.29}Na_{0.73})_{\Sigma=2.02}(K_{0.85}\square_{0.15})_{\Sigma=1.00}Si_8O_{20.06}\cdot 0.89H_2O$ .

**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,  $(U,Th)(Ca,Na)_2(K_{1-x}\square_x)Si_8O_{20}\cdot H_2O$ . *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,  $U^{4+}(Ca,Na)_2(K_{1-x}\square_x)[Si_8O_{20}]$ ,  $x \approx 0.5$ , 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).