

Moskvinite-(Y)**Na₂K(Y,REE)(Si₆O₁₅)**

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As grains, to 2 mm.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle.
Hardness = 5 VHN = 523. D(meas.) = 2.91(1) D(calc.) = 2.92

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (-) [stated by authors]. $\alpha = 1.555(2)$ $\beta = 1.558(2)$ $\gamma = 1.566(2)$
2V(meas.) = 64° 2V(calc.) = 63.8° *Dispersion:* Moderate, $r > v$.

Cell Data: *Space Group:* *Ibmm*. $a = 10.623(2)$ $b = 14.970(2)$ $c = 8.552(2)$ $Z = 4$

X-ray Powder Pattern: Dara-i-Pioz moraine, Tien-Shan Mountains, Tajikistan.
4.98 (100), 3.26 (85), 3.05 (75), 3.45 (50), 2.490 (45), 2.753 (42), 5.32 (35)

Chemistry:	(1)	(2)		(1)	(2)
Na ₂ O	10.66	10.1	Ho ₂ O ₃	0.66	0.25
K ₂ O	7.50	7.8	Er ₂ O ₃	1.17	0.97
Y ₂ O ₃	14.63	17.7	Tm ₂ O ₃		0.15
Nd ₂ O ₃	0.29	0.06	Yb ₂ O ₃		0.98
Sm ₂ O ₃ 3	0.54	0.07	Lu ₂ O ₃		0.10
Gd ₂ O ₃	1.13	0.23	SiO ₂	60.34	60.2
Tb ₂ O ₃	0.43	0.08	Total	100.11	99.61
Dy ₂ O ₃	2.76	0.92			

(1) Dara-i-Pioz moraine, Tien-Shan Mountains, Tajikistan; average of 6 electron microprobe analyses; corresponding to Na_{2.06}K_{0.95}(Y_{0.77}Dy_{0.09}Gd_{0.04}Er_{0.04}Ho_{0.02}Sm_{0.02}Nd_{0.01}Tb_{0.01}) $\Sigma=1.00$ Si₆O₁₅.

(2) Ilímaussaq alkaline complex, South Greenland; electron microprobe analysis, supplemented by LA-ICP-MS analysis, corresponding to Na_{1.94}K_{0.99}(Y_{0.94}Yb_{0.03}Er_{0.03}Dy_{0.03}Ho_{0.01}Gd_{0.01}) $\Sigma=1.05$ Si_{5.98}O₁₅.

Occurrence: In a boulder of coarse-grained, reedmergnerite-bearing pegmatite in the moraine of the Dara-i-Pioz glacier, Alai mountain ridge, Tien-Shan Mountains, northern Tajikistan. Replacing an undetermined mineral of the britholite group in arfvedsonite lujavrite (Greenland).

Association: Shibkovite, nordite-(Ce), leucophanite, microcline, albite, hyalotekite, reedmergnerite, telyushenkoite (Tajikistan); microcline, natrolite, nepheline, sodalite (Greenland).

Distribution: From the Dara-i-Pioz moraine, Tien-Shan Mountains, Tajikistan. From drill core at Kvanefjeld, Ilímaussaq alkaline complex, South Greenland.

Name: Honors the Russian geologist, A.V. Moskvín (1897-1974), a member of the Pamirs-Tadjikskaya expedition and author of numerous scientific papers on the geology of Central Asia.

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

References: (1) Agakhanov, A.A., L.A. Pautov, E.V. Sokolova, F.C. Hawthorne, and V.Y. Karpenko (2003) Moskvinite-(Y), Na₂K(Y,REE)[Si₆O₁₅], a new mineral. *Zapiski Vseross. Mineral. Obshch.*, 132(6), 15-21 (in Russian, English abs.). (2) Sokolova, E., F.C. Hawthorne, A.A. Agakhanov, and L.A. Pautov (2003) The crystal structure of moskvinite-(Y), Na₂K(Y,REE)[Si₆O₁₅], a new silicate mineral with [Si₆O₁₅] three-membered double rings from the Dara-i-Pioz moraine, Tien-Shan Mountains, Tajikistan. *Can. Mineral.*, 41, 513-520. (3) (2004) *Amer. Mineral.*, 89, 1831 (abs. refs. 1 & 2). (4) Friis, H. (2016) First occurrence of moskvinite-(Y) in the Ilímaussaq alkaline complex, South Greenland - implications for rare-earth element mobility. *Mineral. Mag.*, 80, 31-41.