

Polyakovite-(Ce)**(Ce, Ca)₄MgCr₂(Ti, Nb)₂Si₄O₂₂**

Crystal Data: Monoclinic. *Point Group:* 2/m. As equant grains, to 2.5 cm, and as euhedral crystals, elongate along [010] and flattened on {001}, to 2 mm, showing ten forms; almost identical to the forms of chevkinite.

Physical Properties: *Cleavage:* None. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 5.5-6 VNH = 75-987, 874 (200 g load). D(meas.) = 4.75(7) D(calc.) = 5.05 Highly metamict.

Optical Properties: Translucent in thin fragments. *Color:* Black, gray in reflected light.

Streak: Light brown. *Luster:* Vitreous.

Optical Class: Isotropic. $1.931 < n < 1.935$

R: (460) 11.3, (540) 10.9, (580) 10.8, (660) 10.2

Cell Data: *Space Group:* C2/m. $a = 13.398(1)$ $b = 5.6974(5)$ $c = 11.042(2)$ $\beta = 100.539(2)^\circ$ $Z = 2$

X-ray Powder Pattern: N97 mine, Ilmen Natural Reserve, southern Urals, Russia. (annealed) 2.715 (100), 3.18 (50), 2.160 (45), 5.44 (40), 3.15 (40), 2.849 (40), 3.62 (35)

Chemistry:	(1)		(1)
SiO ₂	19.08	UO ₂	0.03
TiO ₂	9.49	Y ₂ O ₃	0.38
FeO	[1.09]	Ce ₂ O ₃	24.24
Fe ₂ O ₃	[4.30]	La ₂ O ₃	15.94
MnO	0.05	Nd ₂ O ₃	4.76
MgO	2.61	Pr ₂ O ₃	2.01
CaO	1.06	Sm ₂ O ₃	0.38
Cr ₂ O ₃	7.42	H ₂ O	0.14
Nb ₂ O ₅	3.98	Total	99.75
ThO ₂	2.79		

(1) The N97 mine, Ilmen Natural Reserve, southern Urals, Russia; average electron microprobe and wet chemical analyses supplemented by IR spectroscopy, FeO and Fe₂O₃ partitioned by Mössbauer spectroscopy; corresponding to (Ce_{1.86}La_{1.23}Nd_{0.35}Pr_{0.15}Sm_{0.01}Y_{0.04}Ca_{0.24}Th_{0.12}) $\Sigma=4.00$ (Mg_{0.80}Fe²⁺_{0.20}Mn²⁺_{0.01}) $\Sigma=1.02$ (Cr³⁺_{1.28}Fe³⁺_{0.72}) $\Sigma=2.00$ (Ti_{1.52}Nb_{0.32}□_{0.16}) $\Sigma=2.00$ Si₄O₂₂.

Mineral Group: Chevkinite group, chevkinite subgroup.

Occurrence: In a carbonatite vein cutting phlogopite-fluororichterite rock.

Association: Calcite, dolomite, fluororichterite, phlogopite, forsterite, monazite-(Ce), clinohumite, chromite, thorianite.

Distribution: From the N97 mine, Ilmen Natural Reserve, southern Urals, Russia.

Name: Honors mineralogist Vladislav O. Polyakov (1950-1993), who began this investigation.

Type Material: Museum of the Ilmen Natural Reserve at Miass, and the A.E. Fersman Mineralogical Museum, Moscow, Russia.

References: (1) Popov, V.A., L.A. Pautov, E. Sokolova, F.C. Hawthorne, C. McCammon, and L.F. Bazhenova (2001) Polyakovite-(Ce), (REE,Ca)₄(Mg,Fe²⁺)(Cr³⁺,Fe³⁺)₂(Ti,Nb)₂Si₄O₂₂, a new metamict mineral species from the Ilmen Mountains, southern Urals, Russia: mineral description and crystal chemistry. Can. Mineral., 39, 1095-1104. (2) (2002) Amer. Mineral., 87, 766-767 (abs. ref. 1).