

Golyshevite

Crystal Data: Hexagonal. *Point Group:* 3/m. As tabular crystals exhibiting $10\bar{1}1$, $\{01\bar{1}2\}$ and $\{0001\}$, to 2 cm.

Physical Properties: *Cleavage:* Imperfect on $\{0001\}$. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 5.5 D(meas.) = 2.89(1) D(calc.) = 2.889

Optical Properties: Translucent. *Color:* Brown to reddish brown. *Streak:* White. *Luster:* Vitreous.

Optical Class: Uniaxial (-). $\omega = 1.618(2)$ $\varepsilon = 1.628(1)$ *Pleochroism:* Weak, colorless to yellow.

Cell Data: *Space Group:* R3m. $a = 14.231(3)$ $c = 29.984(8)$ $Z = 3$

X-ray Powder Pattern: Kovdor massif, Kola Peninsula, Russia. 2.848 (100), 2.971 (78), 4.30 (53), 2.055 (51), 3.200 (46), 2.597 (43), 5.70 (38)

Chemistry:	(1)		(1)
Na ₂ O	9.19	SiO ₂	48.74
K ₂ O	0.46	ZrO ₂	12.03
CaO	17.24	Nb ₂ O ₅	2.63
MnO	0.69	Cl	0.24
FeO	1.19	H ₂ O	1.30
Fe ₂ O ₃	4.44	CO ₂	1.52
Al ₂ O ₃	0.14	<u>-O = Cl</u>	<u>0.05</u>
La ₂ O ₃	0.15	Total	100.20
Ce ₂ O ₃	0.29		

(1) Kovdor massif, Kola Peninsula, Russia; by electron microprobe analysis, IR and Mössbauer spectroscopy, and TGA; corresponding to $(\text{Na}_{9.02}\text{Ca}_{0.43}\text{K}_{0.30})_{\Sigma=9.75}(\text{Ca}_{5.92}\text{Ce}_{0.05}\text{La}_{0.03})_{\Sigma=6.00}(\text{Fe}^{3+}_{1.69}\text{Fe}^{2+}_{0.50}\text{Mn}_{0.29})_{\Sigma=2.48}\text{Zr}_{2.97}(\text{Si}_{0.66}\text{Nb}_{0.60}\text{Al}_{0.08})_{\Sigma=1.34}\text{Si}_{24}\text{O}_{72}(\text{OH})_{2.37}(\text{CO}_3)_{1.05}\text{Cl}_{0.21}\cdot 1.01\text{H}_2\text{O}$.

Mineral Group: Eudialyte group, the CO₃-dominant analog of feklischevite with Si > Nb in the M3 structural site.

Occurrence: In a calcium-rich peralkaline pegmatite.

Association: Cancrinite, aegirine-augite, hedenbergite, orthoclase, pectolite, thomsonite-Ca, tacharanite, calcite.

Distribution: From the northern face of the Mica quarry, pegmatite no. 10, Kovdor massif, Kola Peninsula, Russia.

Name: Honors crystallographer Vladimir Mikhailovich Golyshev (1943-2000), Mordvinian State University, Saransk, Russia.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, (3220/1).

References: (1) Chukanov, N.V., M.M. Moiseyev, R.K. Rastsvetayeva, K.A. Rozenberg, and A.E. Zadov (2005) Golyshevite $(\text{Na,Ca})_{10}\text{Ca}_9(\text{Fe}^{3+},\text{Fe}^{2+})_2\text{Zr}_3\text{NbSi}_{25}\text{O}_{72}(\text{CO}_3)(\text{OH})_3\cdot\text{H}_2\text{O}$, and mogovidite, $\text{Na}_9(\text{Ca,Na})_6\text{Ca}_6(\text{Fe}^{3+},\text{Fe}^{2+})_2\text{Zr}_3\text{Si}_{25}\text{O}_{72}(\text{CO}_3)(\text{OH,H}_2\text{O})_4$, new eudialyte-group minerals from calcium-rich agpaite pegmatites of the Kovdor massif, Kola Peninsula. Zap.Ross. Mineral. Obshch., 134(6), 36-47 (in Russian with English abstract). (2) (2007) Amer. Mineral., 92, 1541 (abs. ref. 1).