

**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . Crystals, to 0.7 mm, show {100} and {110}.

**Physical Properties:** *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle.  
Hardness = 5.5 VHN = 479-616 (70 g load). D(meas.) = 4.72(1) D(calc.) = 4.69

**Optical Properties:** Opaque. *Color:* Brownish black. *Streak:* Pale yellow. *Luster:* Adamantine.  
*Optical Class:* Isotropic.  $n = 2.20(1)$   
R: (440) 16.55, (500) 15.50, (560) 14.80, (620) 14.45, (680) 14.35

**Cell Data:** Space Group:  $P4/m\bar{3}2/m$ .  $a = 3.909(1)$   $Z = 1$

**X-ray Powder Pattern:** Khibina alkaline complex, Kola Peninsula, Russia.  
2.765 (100), 1.953 (53), 3.915 (35), 1.594 (30), 1.380 (22), 1.745 (10), 1.234 (10)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
Na <sub>2</sub> O	13.65	12.82	12.28	Sm <sub>2</sub> O <sub>3</sub>	n.d.	n.d.	0.03
K <sub>2</sub> O	0.07	0.06	0.04	ThO <sub>2</sub>	1.15	2.41	2.98
CaO	2.82	2.25	1.48	Nb <sub>2</sub> O <sub>5</sub>	53.41	44.23	40.68
SrO	2.03	2.02	1.42	Ta <sub>2</sub> O <sub>5</sub>	0.58	0.79	0.39
La <sub>2</sub> O <sub>3</sub>	5.17	7.80	7.83	TiO <sub>2</sub>	18.05	21.08	23.00
Pr <sub>2</sub> O <sub>3</sub>	3.12	5.07	7.44	Fe <sub>2</sub> O <sub>3</sub>	0.02	0.03	0.02
Ce <sub>2</sub> O <sub>3</sub>	0.15	0.20	0.45	H <sub>2</sub> O	[0.67]	[0.44]	[0.53]
Nd <sub>2</sub> O <sub>3</sub>	0.18	0.33	0.82	Total	100.07	99.53	99.39

(1)-(3) Khibina complex, Kola Peninsula, Russia; electron microprobe analyses of zoned crystal from core (1) to rim (3), water calculated; corresponds to (Na<sub>0.66-0.73</sub>La<sub>0.05-0.08</sub>Ce<sub>0.03-0.08</sub>Nd<sub>0.00-0.01</sub>Ca<sub>0.05-0.08</sub>Sr<sub>0.02-0.03</sub>Th<sub>0.01-0.03</sub>) $\Sigma=0.82-1.04$ (Nb<sub>0.52-0.66</sub>Ti<sub>0.35-0.49</sub>) $\Sigma=0.87-1.15$ O<sub>3.00</sub>. (4) Khibina complex, Kola Peninsula, Russia; average of 40 electron microprobe analyses not given; corresponds to (Na<sub>0.84</sub>Ca<sub>0.07</sub>Sr<sub>0.01</sub>La<sub>0.01</sub>Ce<sub>0.01</sub>) $\Sigma=0.95$ (Nb<sub>0.90</sub>Ti<sub>0.11</sub>) $\Sigma=1.01$ O<sub>3</sub>.

**Polymorphism & Series:** Polymorph of lueshite.

**Mineral Group:** Perovskite group.

**Occurrence:** In a hydrothermally altered pegmatite vein in ijolite-urtite. Perhaps a quenched polymorph of lueshite, formed by rapid crystallization after a sudden drop in temperature and/or pressure.

**Association:** Microcline, sodalite, aegirine, arfvedsonite, lamprophyllite.

**Distribution:** From the Kukisvumchorr apatite deposit, Khibina alkaline complex, Kola Peninsula, Russia.

**Name:** Recognizes the typical *isometric* habit and optical *isotropism* in contrast to the orthorhombic polymorph *lueshite*.

**Type Material:** Mining Museum of the Mining Institute, St. Petersburg, and in the Mineralogical Museum of St. Petersburg State University, Russia.

**References:** (1) Chakhmouradian, A., V. Yakovenchuk, R.H. Mitchell, and A. Bogdanova (1997) Isolueshite: a new mineral of the perovskite group from the Khibina alkaline complex. *Eur. J. Mineral.*, 9(3), 483-490. (2) Krivovichev, S.V., A.R. Chakhmouradian, R.H. Mitchell, S.K. Filatov, and N.V. Chukanov (2000) Crystal structure of isolueshite and its synthetic compositional analogue. *Eur. J. Mineral.*, 12(3), 597-607. (3) Zaitsev, A.N., E.S. Zhitova, J. Spratt, A.A. Zolotarev, and S.V. Krivovichev (2017) Isolueshite, NaNbO<sub>3</sub>, from the Kovdor carbonatite, Kola peninsula, Russia: composition, crystal structure and possible formation scenarios. *Neues Jahrb. Mineral., Abh.*, 194(2), 165-173.