

Laptevite-(Ce)

Crystal Data: Hexagonal. *Point Group:* 3m. As crystals of irregular shape, to 1 cm.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle.
Hardness = 4-4.5 VHN = 443-485 (50 g load). D(meas.) = 4.61(2) D(calc.) = 4.660

Optical Properties: Translucent. *Color:* Brown, with yellowish cores (metamict). *Streak:* n.d.
Luster: Vitreous to greasy.
Optical Class: Uniaxial (-). $\omega = 1.741(3)$ $\varepsilon = 1.720(3)$

Cell Data: *Space Group:* R3m. $a = 10.804(2)$ $c = 27.726(6)$ $Z = 3$

X-ray Powder Pattern: Upper Darai-Pioz alkaline massif, Northern Tajikistan.
3.03 (100), 2.982 (85), 2.954 (60), 2.689 (40), 1.797 (31), 4.41 (29), 3.13 (26)

Chemistry:	(1)	(1)	(1)		
SiO ₂	15.67	Y ₂ O ₃	11.30	Dy ₂ O ₃	1.37
TiO ₂	0.28	La ₂ O ₃	14.54	Tm ₂ O ₃	0.17
ZrO ₂	0.01	Ce ₂ O ₃	16.93	Yb ₂ O ₃	0.28
ThO ₂	0.38	Pr ₂ O ₃	2.76	B ₂ O ₃	4.98
UO ₂	0.65	Nd ₂ O ₃	5.16	P ₂ O ₅	1.51
FeO	1.48	Sm ₂ O ₃	0.98	Na ₂ O	1.05
CaO	11.64	Eu ₂ O ₃	0.10	F	8.53
MnO	1.02	Gd ₂ O ₃	1.56	<u>-O=F₂</u>	<u>3.59</u>
SrO	0.95	Tb ₂ O ₃	0.29	Total	100.00

(1) Upper Darai-Pioz alkaline massif, Northern Tajikistan; average of 42 electron microprobe analyses; corresponding to $(\text{Na}_{0.88}\text{REE}_{0.12})_{\Sigma=1.00}(\text{Fe}_{0.54}\text{Mn}_{0.37}\text{Ti}_{0.09})_{\Sigma=1.00}(\text{REE}_{6.79}\text{Ca}_{5.40}\text{Y}_{2.60}\text{Sr}_{0.24}\text{U}_{0.06}\text{Th}_{0.04})_{\Sigma=15.13}(\text{SiO}_4)_4(\text{Si}_{2.78}\text{B}_{2.68}\text{P}_{0.55}\text{O}_{17.33}\text{F}_{0.67})(\text{B}_{1.05}\text{O}_3)\text{F}_{11}$, with REE = $\text{Ce}_{2.68}\text{La}_{2.32}\text{Nd}_{0.80}\text{Pr}_{0.44}\text{Gd}_{0.22}\text{Dy}_{0.19}\text{Sm}_{0.15}\text{Yb}_{0.04}\text{Tb}_{0.04}\text{Tm}_{0.02}\text{Eu}_{0.01}$.

Mineral Group: Vicanite group.

Occurrence: A mineral of hydrothermal origin, discovered in a glacial moraine boulder of calcite-bafertisite-aegirine-microcline rock.

Association: Quartz, fluorite, polyolithionite, albite, and intergrown with bafertisite, “calcy-beborosilite-(Y)”, stillwellite-(Ce).

Distribution: Darai-Pioz glacier, at the junction of the Turkestan, Zeravshan, and Alay Mt. Ranges, Tien-Shan, Garmskii district, Northern Tajikistan.

Name: Honors Tatyana Mikhailovna Lapteva (1928-2011), a Russian geologist and petrologist who worked on the geology of Central Asia.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (# 4195/1).

References: (1) Agakhanov, A.A., L.A. Pautov, Yu.A. Uvarova, E.V. Sokolova, F.C. Hawthorne, and V.Yu. Karpenko (2013) Laptevite-(Ce) $\text{NaFe}^{2+}(\text{REE}_7\text{Ca}_5\text{Y}_3)(\text{SiO}_4)_4(\text{Si}_3\text{B}_2\text{PO}_{18})(\text{BO}_3)\text{F}_{11}$ - a new vicanite-group mineral from Darai-Pioz alkaline massif. *Novye dannye o mineralakh* (New data on minerals), 48, 5-11 (in Russian). (2) Uvarova, Y.A., E. Sokolova, F.C. Hawthorne, A.A. Agakhanov, V.Y. Karpenko, and L.A. Pautov (2013) The crystal structure of laptevite-(Ce), $\text{NaFe}^{2+}(\text{REE}_7\text{Ca}_5\text{Y}_3)(\text{SiO}_4)_4(\text{Si}_3\text{B}_2\text{PO}_{18})(\text{BO}_3)\text{F}_{11}$, a new mineral species from the Darai-Pioz alkaline massif, Northern Tajikistan. *Zeitschrift für Kristallographie B*, 228, 550-557. (3) (2014) *Amer. Mineral.*, 99, 2154-2155 (abs. refs. 1 & 2).