Fluocerite-(La) $(La, Ce)F_3$

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Crystal Data: Hexagonal. *Point Group:* $\overline{3}2/m$(synthetic LaF_3). As platy to tabular crystals, to 7 cm.

Physical Properties: *Cleavage:* "Dipyramidal", imperfect. *Fracture:* Conchoidal. *Tenacity:* [Brittle] [by analogy to fluocerite-(Ce)]. Hardness = [4–5] VHN = 390 D(meas.) = 5.93 D(calc.) = 5.94 (synthetic LaF_3).

Optical Properties: Semitransparent. *Color:* Pale greenish yellow. *Luster:* Vitreous. *Optical Class:* Uniaxial (–). $\omega = 1.609$ $\epsilon = 1.603$

Cell Data: *Space Group:* $P\overline{3}c1$(synthetic LaF_3). $a = 7.1871(4)$ $c = 7.3501(5)$ Z = 6

X-ray Powder Pattern: Zhanuzak area, Kazakhstan.
3.19 (10), 1.048 (7), 2.07 (6), 2.01 (6), 1.796 (5.5), 3.60 (4), 1.736 (4)

Chemistry:

	(1)		(1)
ThO_2	1.56	Sm_2O_3	0.17
$(Y, Tb, Dy)_2O_3$	0.08	Gd_2O_3	0.08
La_2O_3	42.34	Fe_2O_3	0.14
Ce_2O_3	33.13	MgO	trace
Pr_2O_3	3.68	CaO	0.54
Nd_2O_3	3.12	F	25.27
		$-O = F_2$	10.64
		Total	99.47

(1) Zhanuzak area, Kazakhstan; spectrographic analysis showed Si 0.2%, Al 0.05%, P 0.05%, Mn 0.005%; corresponds to $(La_{0.50}Ce_{0.39}Pr_{0.04}Nd_{0.04}Ca_{0.02}Th_{0.01})_{\Sigma=1.00}F_{2.55}O_{0.22}$.

Occurrence: In hydrothermal quartz veins in granite.

Association: Quartz.

Distribution: From the Zhanuzak area, Kent massif, Karaganda region, central Kazakhstan.

Name: As the *lanthanum* analog of *fluocerite-(Ce)*.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 68285, vus1051, vis1053.

References: (1) Chistyakova, M.B. and M.E. Kazakova (1969) Fluocerite from Kazakhstan. Trudy Mineral. Muzeya Akad. Nauk SSSR, 19, 236–238 (in Russian). (2) (1984) Amer. Mineral., 69, 566 (abs. ref. 1). (3) Zalkin, A. and D. Templeton (1985) Refinement of the trigonal crystal structure of lanthanum trifluoride with neutron diffraction data. Acta Cryst., 41, 91–93. (4) Belzner, A., H. Schulz, and G. Heger (1994) The thermal vibrations and the fluorine ionic conductivity in LaF_3. Zeits. Krist., 209, 239–248.

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