Cordylite-(La) $(Na,Ca)_2Ba_2(La_3Sr)_{\Sigma=4}(CO_3)_8F_2$

Crystal Data: Hexagonal. *Point Group*: 6/*m* 2/*m* 2/*m*. As irregular grains or rounded tabular to short-prismatic, striated hexagonal crystals, to 3 mm. Also as cores within cordylite-(Ce) grains.

Physical Properties: *Cleavage*: Perfect on {0001}. *Fracture*: Conchoidal to uneven. *Tenacity*: Brittle. Hardness = 4 D(meas.) = 4.31(1) D(calc.) = 4.311-4.329

Optical Properties: Translucent. *Color*: Colorless, honey-yellow, or pinkish yellow. *Streak*: White. *Luster*: Greasy to vitreous.
Optical Class: Uniaxial(-). ε = 1.573(1)–1.574(1) ω = 1.749(2)–1.751(2)

Cell Data: *Space Group*: $P6_3/mcc$. a = 5.1182(3) c = 23.1785(16) Z = 1

X-ray Powder Pattern: Biraya Fe-REE deposit, 145 km east of Bodaibo city, Russia.
3.209 (100), 3.532 (95), 2.562 (89), 4.371 (65), 4.148 (54), 2.213 (52), 1.921 (52)

Chemistry:

	(1)	(2)
La_2O_3	18.31	17.01
Ce_2O_3	15.67	15.93
Pr_2O_3	0.48	1.21
Nd_2O_3	2.10	3.09
CaO	3.17	3.22
SrO	6.70	7.16
BaO	23.43	22.21
Na_2O	2.80	2.78
F	2.47	2.10
-O = F	1.01	0.88
CO_2	[25.87]	[25.89]
H_2O	[0.03]	[0.25]
Total	99.99	99.97

(1) Biraya Fe-REE deposit, 145 km east of Bodaibo city, Russia; electron microprobe analysis, H_2O and CO_2 calculated from crystal structure analysis; corresponding to $(Na_{1.24}Ca_{0.78})_{\Sigma=2.02}Ba_{2.10}[(La_{1.54}Ce_{1.31}Nd_{0.17}Pr_{0.04})_{\Sigma=3.06}Sr_{0.89}]_{\Sigma=3.95}(C_{1.01}O_3)_8(F_{1.78}OH_{0.05})_{\Sigma=1.83}$.
(2) same as above; corresponding to $(Na_{1.23}Ca_{0.79})_{\Sigma=2.02}Ba_{1.98}[(La_{1.43}Ce_{1.33}Nd_{0.25}Pr_{0.10})_{\Sigma=3.11}Sr_{0.94}]_{\Sigma=4.05}(C_{1.01}O_3)_8(F_{1.51}OH_{0.38})_{\Sigma=1.89}$.

Occurrence: In carbonatite lenses associated with a fenite dike.

Association: Aragonite-strontianite, calcian strontianite, strontian calcite, ancylite-(Ce), thorite, carbocernaite, barite, biraite-(Ce), niobium-rich chevkinite-(Ce), fergusonite-(Nd), ancylite-(La), daqingshanite-(Ce), daqingshanite-(La), bastnäsite-(Ce), hydroxylbastnäsite-(Ce), monazite-(Ce), talc, humite, galena, pyrite, pyrrhotite.

Distribution: At the Biraya Fe-REE deposit, north of the Irkutsk district, 145 km east of Bodaibo city, Russia.

Name: For its structural and chemical identity with *cordylite* and dominance of *La* among its rare earth elements.

Type Material: Mineral Science Department, Natural History Museum of Los Angeles County, Los Angeles, USA., (63360) and at the A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia (4028/1, 4029/1).

References: (1) Mills, S.J., P.M. Kartashov, A.R. Kampf, A.A. Konev, A.A. Koneva, and M. Raudsepp (2012) Cordylite-(La), a new mineral species in fenite from the Biraya Fe-REE deposit, Irkutsk, Russia. Can. Mineral., 50, 1281-1290. (2) (2014) Amer. Mineral., 99, 1512-1513 (abs. ref. 1).