Arisite-(La) $NaLa_2(CO_3)_2[F_{2\times}(CO_3)_{1-x}]F$

Crystal Data: Hexagonal. *Point Group*: $\bar{6}m2$. As hexagonal crystals, tabular on {001} to prismatic on {100}, to 1.5 mm. *Twinning*: Reentrant angles observed of an unidentified twin law.

Physical Properties: *Cleavage*: Poor on {001}. F*racture*: Conchoidal. *Tenacity*: Brittle. D(meas.) = > 3.3 D(calc.) = 4.072 *Hardness* = 3.5 Effervesces in dilute HCl. Visually indistinguishable from arisite-(Ce).

Optical Properties: Transparent. *Color*: Beige, beige-yellow, light lemon-yellow to pinkish. *Streak*: White. *Luster*: Vitreous.
Optical Class: Uniaxial (-). ω = 1.696–1.714(4) ε = 1.594–1.611(3) [crystals zoned chemically.]

Cell Data: *Space Group*: $P\bar{6}m2$. a = 5.1131(7) c = 8.6759(17) Z = 1

X-ray Powder Pattern: Ariskop and Railroad (Aris phonolite) quarry, central Namibia.
4.439 (100), 3.103 (87), 4.352 (52), 2.212 (43), 1.9748 (42), 2.561 (38), 1.9501 (16)

Chemistry:

	(1)	(2)		(1)	(2)
Na_2O	6.07	6.49	Sm_2O_3	0.34	
CaO	1.62		Gd_2O_3		
SrO	0.10		CO_2	[22.80]	[18.42]
La_2O_3	28.83	68.19	F	6.51	11.93
Ce_2O_3	26.86		-O=F	2.74	5.02
Pr_2O_3	1.10		Total	94.17	100.00
Nd_2O_3	2.68				

(1) Namibia; average of 4 electron microprobe analyses supplemented by TGA-DTA for CO_2; corresponds to $(Na_{0.99}Ca_{0.01})_{\Sigma=1.00}(La_{0.90}Ce_{0.83}Nd_{0.08}Pr_{0.03}Sm_{0.01}Ca_{0.14})_{\Sigma=1.99}(CO_3)_2[F_{0.73}(CO_3)_{0.63}]F$.
(2) $NaLa_2(CO3)_2[F_{2x}(CO_3)_{1-x}]F$, for x=1.

Occurrence: A late-stage, post-magmatic to hydrothermal mineral in miarolitic cavities as La-rich cores in arisite-(Ce) from phonolite associated with an alkaline volcanic province.

Association: Villiaumite, aegirine, analcime, apatite, fluorite, manganoneptunite, microcline, natrolite, sphalerite, tuperssuatsiaite, the Fe-analogue of zakharovite, arisite-(Ce).

Distribution: From the Ariskop and Railroad (Aris phonolite) quarry, central Namibia.

Name: The *La*-dominant analog of *arisite*-(Ce), which is named for the *Aris* phonolite, Namibia.

Type Material: Canadian Museum of Nature, Ottawa, Ontario, Canada (CMNMC 86076).

References: (1) Piilonen, P.C., A.M. McDonald, J.D. Grice, M.A. Cooper, U. Kolitsch, R. Rowe, R.A. Gault, and G. Poirier (2010) Arisite-(La), a new REE-fluorcarbonate mineral from the Aris phonolite (Namibia), with descriptions of the crystal structures of arisite-(La) and arisite-(Ce). Mineral. Mag., 74(2), 257-268. (2) (2011) Amer. Mineral., 96, 937-938 (abs. ref. 1).