

Crystal Data: Hexagonal. *Point Group:* 6/m. As aggregates and patches of radiating to subparallel groups of nearly equant to prismatic crystals to 0.5 mm.

Physical Properties: *Cleavage:* Distinct on {0001}. *Fracture:* Even to conchoidal. *Tenacity:* Brittle. Hardness = ~5 D(meas.) = 4.66(1) D(calc.) = 4.66 May be metamict.

Optical Properties: Opaque to translucent. *Color:* Pale yellow, tan, reddish brown; pale yellow in transmitted light. *Streak:* Colorless to pale brown. *Luster:* Adamantine. *Optical Class:* Uniaxial (-). $\omega = 1.792(5)$ $\varepsilon = 1.786(5)$ Nonpleochroic to weakly pleochroic from yellowish, light orange to light brown (Argentina).

Cell Data: *Space Group:* $P6_3/m$. $a = 9.517(5)$ - $9.537(6)$ $c = 6.983(4)$ - $7.008(5)$ $Z = 2$

X-ray Powder Pattern: Mont Saint-Hilaire, Quebec, Canada, after heating at 800 °C for 3 hours. 2.845 (100), 2.822 (40), 1.870 (40), 2.747 (30), 1.970 (30), 4.11 (20), 3.494 (20)

Chemistry:	(1)		(1)
CaO	13.96	U ₃ O ₈	0.30
SrO	0.45	MgO	0.02
Y ₂ O ₃	1.26	Na ₂ O	0.01
La ₂ O ₃	15.80	SiO ₂	20.61
Ce ₂ O ₃	29.17	P ₂ O ₅	2.84
Pr ₂ O ₃	3.52	F	2.38
Nd ₂ O ₃	8.83	- O = F ₂	1.00
Sm ₂ O ₃	0.67	Total	100.56
ThO ₂	1.74		

(1) Mont Saint-Hilaire, Quebec, Canada; average electron microprobe analysis; corresponding to (Ca_{1.95}Ce_{1.39}La_{0.76}Nd_{0.31}Pr_{0.17}Y_{0.09}Th_{0.05}Sr_{0.03}Sm_{0.03}) $\Sigma=4.78$ (Si_{2.68}P_{0.31}) $\Sigma=2.99$ O_{12.02}F_{0.98}.

Mineral Group: Apatite supergroup, britholite group.

Occurrence: In vugs in nepheline syenite, marble xenoliths, sodalite syenite xenoliths, and pegmatite dikes (Mont Saint-Hilaire).

Association: Analcime, microcline, aegirine, zircon, biotite, pyrophanite, astrophyllite, ancylite, natrolite, monazite (in vugs); fluorite, pectolite, calcite, aegirine, carbonate-apatite, biotite, gotzenite (in marble xenoliths); lovozerite, lueshite, ussingite, eudialyte, steenstrupine, gmelinite, phillipsite, chabazite, sodalite, analcime, serandite, albite. Monazite-(Ce), fluorite, quartz, uraninite (Colorado).

Distribution: From Mont Saint-Hilaire, Quebec, Canada [TL]; from the Sakharjok massif, Kola Peninsula, Russia; abundant at Rodeo de los Molles, Central Argentina. At the "Rusty Gold" deposit, SE side of the Longs Peak-St. Vrain intrusion, near Jamestown, Colorado, USA.

Name: As the *fluorine*-dominant analogue of *britholite*-(Ce).

Type Material: Canadian Museum of Nature, Ottawa, Ontario.

References: (1) Gu, J., G.Y. Chao, and S. Tang (1994) A new mineral - fluorbritholite-(Ce). Journal of Wuhan University of Technology, 9, 9-14. (2) (1996) Amer. Mineral., 81, 1013-1014 (abs. ref. 1). (3) Zozulya, D.R., L.M. Lyalina, and Y.E. Savchenko (2017) Britholite-group minerals as sensitive indicators of changing fluid composition during pegmatite formation: evidence from the Keivy alkaline province, Kola peninsula, NW Russia. Mineralogy and Petrology, 111(4), 511-522. (4) Lorenz, M., U. Altenberger, R.B. Trumbull, R. Lira, M. López de Luchi, C. Günter, and S. Eidner (2019) Chemical and textural relations of britholite- and apatite-group minerals from hydrothermal REE mineralization at the Rodeo de los Molles deposit, Central Argentina. Amer. Mineral., 104(12), 1840-1850. (5) Allaz, J., M.B. Raschke, P.M. Persson, and C.R. Stern (2015) Age, petrochemistry, and origin of a REE-rich mineralization in the Longs Peak-St. Vrain batholith, near Jamestown, Colorado (U.S.A.). Amer. Mineral., 100(10), 2123-2140.