

Synchysite-(Ce)**Ca(Ce, La)(CO₃)₂F**

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Crystal Data: Monoclinic, pseudohexagonal. *Point Group:* 2/*m*. Crystals are commonly acute pyramidal [using pseudohexagonal indices] {10 $\bar{1}$ 0} to tabular and striated || {0001}, but oscillatory and sceptered due to syntactic intergrowths || {0001} with bastnäsité-(Ce), parisite-(Ce), röntgenite-(Ce), cordylite, to 6 cm. *Twinning:* On {0001}, may be lamellar.

Physical Properties: *Fracture:* Subconchoidal to splintery. *Tenacity:* Brittle. Hardness = 4.5 D(meas.) = 3.90 D(calc.) = 3.88

Optical Properties: Translucent. *Color:* Wax-yellow, brown, grayish yellow; colorless to pale yellow in transmitted light. *Luster:* Vitreous to subadamantine, may be greasy. *Optical Class:* Uniaxial (+). *Pleochroism:* Weak. *Absorption:* $O < E$. $\omega = 1.674$ $\epsilon = 1.770$

Cell Data: *Space Group:* *C*2/*c*. $a = 12.329(2)$ $b = 7.110(1)$ $c = 18.741(2)$
 $\beta = 102.68(1)^\circ$ $Z = 12$

X-ray Powder Pattern: Predazzo, Italy.

3.55 (100), 2.80 (100), 9.1 (60), 4.53 (50), 2.06 (50), 1.934 (50), 3.32 (40)

Chemistry:	(1)	(1)	(1)			
	CO ₂	[27.95]	Ce ₂ O ₃	22.34	Gd ₂ O ₃	1.27
	SiO ₂	0.14	Pr ₂ O ₃	2.27	CaO	18.14
	Y ₂ O ₃	0.45	Nd ₂ O ₃	12.73	F	[5.73]
	La ₂ O ₃	9.96	Sm ₂ O ₃	1.79	—O = F ₂	2.41
					Total	[100.36]

(1) Trimouns talc deposit, France; by electron microprobe, average of ten points, CO₂ and F calculated from stoichiometry; corresponds to Ca_{1.02}(Ce_{0.43}La_{0.24}Nd_{0.19}Pr_{0.05}Sm_{0.03}Gd_{0.02}Y_{0.01})_{Σ=0.97}(CO₃)₂F. (2) Mont Saint-Hilaire, Canada; analysis not given, stated to correspond to Ca_{0.94}(Ce_{0.62}La_{0.32}Y_{0.02}Th_{0.01}Eu_{0.01})_{Σ=0.98}(CO₃)₂F_{0.64}.

Occurrence: An uncommon hydrothermal accessory mineral in granites and alkalic syenites.

Association: Astrophyllite, catapleite, neptunite, epididymite, elpidite, cordylite, fluorite, rhodochrosite, polyolithionite, aegirine, microcline, albite (Narssârssuk, Greenland); ewaldite, belovite-(Ce), fluorite, nenadkevichite, ancylite-(Ce), kukharenkoite-(Ce), mckelveyite-(Y), burbankite, calcite, barite, orthoclase (Khibiny massif, Russia).

Distribution: In Greenland, very large crystals from Narssârssuk, and in the Ilímaussaq intrusion. At Holmestrand, Norway. In the Valle de Arán, Lerida Province, Spain. In Italy, from Predazzo, Trentino-Alto Adige, and on the east flank of Pizzo Cervandone, Alpe Devero, Val d'Aosta, Piedmont. In Switzerland, from Piz Blas, Val Nalps, and at La Bianca, Val Casatscha, Grisons; on the west flank of Cherbadung [Pizzo Cervandone], Binntal, Valais; with many other minor occurrences. In the Kaiserer and Lohningbruch quarries, Rauris Valley, Salzburg, Austria. In the Trimouns talc deposit, six km northeast of Luzenac, Ariège, France. In Russia, rock-forming in the Khibiny massif, Kola Peninsula. From the Lueshe carbonatite, 150 km north of Goma, Kivu Province, Congo (Zaire). In Canada, from Mont Saint-Hilaire and at Saint-Amable, Quebec. From Mt. Weld, 34 km south of Laverton, Western Australia. Increasingly recognized from additional localities.

Name: From the Greek for *confounding*, as originally thought to be parisite, and dominant *cerium*.

Type Material: University of Copenhagen, Copenhagen, Denmark.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 287–289. (2) Wang, L., Y. Ni, J.M. Hughes, P. Bayliss, and J.W. Drexler (1994) The atomic arrangement of synchysite-(Ce), CeCaF(CO₃)₂. Can. Mineral., 32, 865–871. (3) de Parseval, P., F. Fontan, and T. Aigouy (1997) Composition chimique des minéraux de terres rares de Trimouns (Ariège, France). Compt. Rendus Acad. Sci. Paris, 324, 625–630 (in French with English abs.).

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