

**Ancylite-(Ce)****Sr(Ce, La)(CO<sub>3</sub>)<sub>2</sub>(OH)•H<sub>2</sub>O**

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**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . Crystals are typically pseudo-octahedral {111}, modified by {120}, with curved faces, or short prismatic [001], to 6 mm; as groups of crystals and forming crusts.

**Physical Properties:** *Fracture:* Splintery. *Tenacity:* Tough. *Hardness* = 4–4.5  
D(meas.) = 3.82–4.30 D(calc.) = 4.15

**Optical Properties:** Translucent. *Color:* Pale yellow-orange, pink, yellowish brown to brown, gray; colorless in transmitted light. *Streak:* White. *Luster:* Vitreous to dull on crystal faces, greasy on fracture surfaces.

*Optical Class:* Biaxial (–). *Orientation:*  $X = a$ ;  $Y = b$ ;  $Z = c$ . *Dispersion:*  $r < v$ .  
 $\alpha = 1.615$ – $1.654$   $\beta = 1.695$ – $1.733$   $\gamma = 1.730$ – $1.772$   $2V(\text{meas.}) = 70(5)^\circ$

**Cell Data:** *Space Group:*  $Pmcn$ .  $a = 4.97$ – $5.03$   $b = 8.49$ – $8.53$   $c = 7.24$ – $7.29$   $Z = 2$

**X-ray Powder Pattern:** Narssârssuk, Greenland; nearly identical to ancylite-(La).  
4.34 (100), 3.71 (100), 2.96 (100), 2.35 (80), 2.09 (70), 2.02 (70), 5.57 (50)

<b>Chemistry:</b>	(1)	(2)	(3)		(1)	(2)	(3)
CO <sub>2</sub>	23.28	23.44	22.99	FeO	0.35	0.19	
ThO <sub>2</sub>	0.20	0.53		CaO	1.52	1.35	
La <sub>2</sub> O <sub>3</sub>		13.08		SrO	21.03	23.97	27.07
(La,Dy) <sub>2</sub> O <sub>3</sub>	24.04			BaO		0.59	
Ce <sub>2</sub> O <sub>3</sub>	22.22	23.40	42.88	F		2.15	
Pr <sub>2</sub> O <sub>3</sub>		1.94		H <sub>2</sub> O	6.52		7.06
Nd <sub>2</sub> O <sub>3</sub>		5.35		–O = F <sub>2</sub>		0.90	
Sm <sub>2</sub> O <sub>3</sub>		0.29		insol.	0.60		
Gd <sub>2</sub> O <sub>3</sub>		0.14					
				Total	99.76	[95.52]	100.00

(1) Narssârssuk, Greenland. (2) Khibiny massif, Kola Peninsula, Russia; by electron microprobe, original total 99.51%; corresponds to  $(\text{Sr}_{0.86}\text{Ca}_{0.09}\text{Ba}_{0.01}\text{Fe}_{0.01})_{\Sigma=0.97}(\text{Ce}_{0.53}\text{La}_{0.30}\text{Nd}_{0.12}\text{Pr}_{0.04}\text{Sm}_{0.01}\text{Th}_{0.01})_{\Sigma=1.01}(\text{CO}_3)_2(\text{OH})\cdot\text{H}_2\text{O}$ . (3)  $\text{SrCe}(\text{CO}_3)_2(\text{OH})\cdot\text{H}_2\text{O}$ .

**Occurrence:** An uncommon accessory mineral in some nepheline syenites and carbonatites.

**Association:** Parisite-(Ce), synchysite-(Y), cordylite-(Ce), eudidymite, aegirine, microcline.

**Distribution:** From Narssârssuk, Greenland. In Canada, large crystals at Mont Saint-Hilaire, in the Miron quarry, Montreal, and from near Saint-Amable, Quebec; at the Ice River complex, near Field, British Columbia; in the Desmond mine, Wilberforce, Ontario. In the USA, in the Sheep Creek vein, Ravalli Co., and the “vermiculite prospects”, Bearpaw Mountains, Hill Co., Montana; at Gem Park, Fremont Co., Colorado. In Russia, from the Lovozero, Khibiny, and other massifs, Kola Peninsula. From Langesundsfjord, Norway. At Weishan, Shandong Province, China. In the Jacupiranga mine, São Paulo, Brazil. At the Lueshe carbonatite, 150 km north of Goma, Kivu Province, Congo (Zaire).

**Name:** From the Greek for *curved*, in allusion to the characteristically curved crystals.

**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, 291–293. (2) Keidel, F.A., A. Montgomery, C.W. Wolfe, and R.P. Christian (1971) Calcian ancylite [calcioancylite-(Ce)] from Pennsylvania: new data. *Mineral. Record*, 2, 18–25, 36. (3) Dal Negro, A., G. Rossi, and V. Tazzoli (1975) The crystal structure of ancylite,  $(\text{RE})_x(\text{Ca}, \text{Sr})_{2-x}(\text{CO}_3)_2(\text{OH})_x(2-x)\text{H}_2\text{O}$ . *Amer. Mineral.*, 60, 280–284. (4) Zaitsev, A.N., F. Wall, and M.J. Le Bas (1998) REE-Sr-Ba minerals from the Khibina carbonatites, Kola Peninsula, Russia: their mineralogy, paragenesis, and evolution. *Mineral. Mag.*, 62, 225–250. (5) Traill, R.J. and A.P. Sabina (1960) Catalogue of X-ray diffraction patterns and specimen mounts on file at the Geological Survey of Canada. *Geol. Sur. of Canada, Paper* 60-4, 6.

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