

Aluminocerite-(Ce) $(\text{Ce, REE, Ca})_9(\text{Al, Fe}^{3+})(\text{SiO}_4)_3[\text{SiO}_3(\text{OH})]_4(\text{OH})_3$

Crystal Data: Hexagonal. *Point Group:* $3m$. As aggregates of pseudo-octahedral to rhombohedral crystals to $50\ \mu\text{m}$, flattened on the c axis.

Physical Properties: *Cleavage:* None. *Fracture:* n.d. *Tenacity:* Brittle. Hardness = 5
D(meas.) = n.d. D(calc.) = 4.675

Optical Properties: Translucent. *Color:* Pale pink to pink-red. *Streak:* White. *Luster:* Vitreous.
Optical Class: Uniaxial (+). $\omega = 1.810\text{--}1.816$ $\epsilon = 1.812\text{--}1.822$ Non-pleochroic.

Cell Data: *Space Group:* $R3c$. $a = 10.645(1)$ $c = 38.019(5)$ $Z = 6$

X-ray Powder Pattern: Calculated pattern.

2.914 (100), 2.647 (58), 1.732 (46), 2.198 (40), 1.923 (34), 3.405 (27), 3.250 (26)

Chemistry:	(1)	(2)
Ce ₂ O ₃	23.37	58.36
Nd ₂ O ₃	15.59	
La ₂ O ₃	7.43	
Sm ₂ O ₃	4.38	
Pr ₂ O ₃	3.54	
Gd ₂ O ₃	3.12	
Y ₂ O ₃	1.68	
Dy ₂ O ₃	0.46	
Yb ₂ O ₃	0.07	
CaO	8.31	9.97
Fe ₂ O ₃	0.47	
Al ₂ O ₃	2.47	3.02
SiO ₂	24.01	24.92
H ₂ O	[3.63]	3.73
Total	98.53	100.00

(1) Ratti quarry, near Baveno, Italy; average electron microprobe analysis supplemented by Raman spectroscopy, H₂O calculated from crystal-chemical constraints; corresponding to $(\text{Ca}_{2.60}\text{Ce}_{2.49}\text{Nd}_{1.62}\text{La}_{0.80}\text{Sm}_{0.44}\text{Pr}_{0.38}\text{Gd}_{0.30}\text{Y}_{0.26}\text{Dy}_{0.04}\text{Yb}_{0.01})_{\Sigma=8.94}(\text{Al}^{3+}_{0.85}\text{Fe}^{3+}_{0.10})_{\Sigma=0.95}(\text{SiO}_4)_3[\text{SiO}_3(\text{OH})]_4(\text{OH})_{3.06}$.
(2) $(\text{Ce}_6\text{Ca}_3)\text{Al}(\text{SiO}_4)_3[\text{SiO}_3(\text{OH})]_4(\text{OH})_3$.

Occurrence: In secondary and miarolitic cavities in NYF (niobium-yttrium-fluorine) granite pegmatite veins and pods within pink granite.

Association: Hingganite-(Y), Yb-rich hingganite-(Y), thorite, fluorite, albite, quartz, K-feldspar.

Distribution: From the Ratti and Locatelli quarries, near Baveno, Verbania province, Piemonte region, Italy.

Name: *Alumino* for a *cerite* with dominant aluminum in the M site and a suffix for the dominant REE.

Type Material: Museum of Mineralogy, University of Padua, Italy (MM5200 and MM5549).

References: (1) Nestola, F., A. Guastoni, F. Cámara, L. Secco, A. Dal Negro, D. Pedron, and A. Beran (2009) Aluminocerite-Ce: A new species from Baveno, Italy: Description and crystal-structure determination. *Amer. Mineral.*, 94, 487-493.