

Allanite-(La)**Ca(REE,Ca)Al₂(Fe²⁺,Fe³⁺)(SiO₄)(Si₂O₇)O(OH)**

Crystal Data: Monoclinic. *Point Group:* 2/m. Prismatic crystals display {001}, {100}, {10 $\bar{1}$ }, {101}, {210}, and {011}, and are elongated along [010], to 3 mm.

Physical Properties: *Cleavage:* Imperfect on {001}. *Fracture:* Conchoidal. *Tenacity:* Brittle. *Hardness* = 6 D(meas.) = 3.93(1) D(calc.) = 3.94

Optical Properties: Transparent to translucent. *Color:* Black with brownish reflections. *Streak:* Brown. *Luster:* Vitreous. *Optical Class:* Biaxial. $\alpha = 1.755(5)$ $\beta = 1.760(5)$ $\gamma = 1.765(5)$ $2V(\text{meas.}) = 90(2)^\circ$ *Orientation:* $Y = b$. *Dispersion:* Very high. *Pleochroism:* Strong, $X = \text{n.d.}$, $Y = \text{greenish to olive-green}$, $Z = \text{greenish brown}$.

Cell Data: *Space Group:* $P2_1/m$. $a = 8.914(4)$ $b = 5.726(1)$ $c = 10.132(6)$ $\beta = 114.87(5)^\circ$ $Z = 2$

X-ray Powder Pattern: Buca della Vena mine, Apuan Alps, Tuscany, Italy. 2.901 (100), 2.692 (60), 2.611 (50), 2.806 (40), 2.174 (25), 3.506 (20), 1.632 (20)

Chemistry:	(1)
SiO ₂	32.45
TiO ₂	0.10
ThO ₂	0.31
Al ₂ O ₃	17.77
Y ₂ O ₃	0.035
La ₂ O ₃	8.51
Ce ₂ O ₃	6.12
Pr ₂ O ₃	3.16
Nd ₂ O ₃	3.53
MgO	0.32
CaO	13.01
FeO	[8.72]
Fe ₂ O ₃	[5.50]
H ₂ O	[1.63]
Total	100.62

(1) Buca della Vena mine, near Stazzema, Apuan Alps, Tuscany, Italy; average of 8 electron microprobe analyses, H₂O, FeO, Fe₂O₃ calculated from structure analysis; corresponds to Ca_{1.000}[(La_{0.288}Ce_{0.206}Nd_{0.116}Pr_{0.106}Y_{0.001}) $\Sigma=0.717$ Ca_{0.279}Th_{0.006}] $\Sigma=1.002$ (Al_{0.899}Fe³⁺_{0.101}) $\Sigma=1.000$ Al_{1.000}(Fe²⁺_{0.669}Fe³⁺_{0.279}Mg_{0.044}Ti_{0.007}) $\Sigma=0.999$ [(Si_{0.978}Al_{0.022}) $\Sigma=1.000$ O₄](Si₂O₇)O(OH).

Mineral Group: Epidote group, allanite subgroup.

Occurrence: In barite veins that cut a dolomitic metamorphosed limestone.

Association: Calcite, barite.

Distribution: From the Castello zone of the Buca della Vena mine, near Stazzema, Apuan Alps, Tuscany, Italy.

Name: For the La-dominant analog of *allanite*-(Ce).

Type Material: Natural History Museum, University of Pisa, Italy (#10478).

References: (1) Orlandi, P. and M. Pasero (2006) Allanite-(La) from Buca della Vena mine, Apuan Alps, Italy, an epidote-group mineral. *Can. Mineral.*, 44, 63-68. (2) (2006) *Amer. Mineral.*, 91, 1945 (abs. ref. 1).