

Crystal Data: Orthorhombic. *Point Group:* $2/m \ 2/m \ 2/m$. As thin, roughly six-sided platelets flattened on {010} and elongated along [100] to 1 mm, as radial aggregates.

Physical Properties: *Cleavage:* Perfect on {010}, less perfect on {100}. *Fracture:* n.d. *Tenacity:* Brittle. *Hardness* = n.d. *D(meas.)* = n.d. *D(calc.)* = 2.810

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Pearly. *Optical Class:* Biaxial (+). α = n.d. β = 1.566(2) γ = 1.577(2) $2V(\text{meas.})$ = low. *Orientation:* $Z = a, X = b, Y = c$. Positive elongation along [100] and parallel extinction.

Cell Data: *Space Group:* $Pnma$. $a = 7.8412(3)$ $b = 11.0313(5)$ $c = 11.3870(4)$ $Z = 2$

X-ray Powder Pattern: Luserna Valley, Piedmont, Italy.
11.02 (100), 7.90 (49), 4.258 (33), 3.195 (27), 5.66 (25), 5.06 (24), 3.095 (21)

Chemistry:	(1)	(2)
Al ₂ O ₃	6.11	6.39
Y ₂ O ₃	43.52	56.61
La ₂ O ₃	0.02	
Ce ₂ O ₃	0.04	
Nd ₂ O ₃	0.03	
Sm ₂ O ₃	0.16	
Gd ₂ O ₃	1.39	
Dy ₂ O ₃	3.46	
Er ₂ O ₃	3.15	
Yb ₂ O ₃	2.09	
CaO	0.33	
PbO	0.37	
H ₂ O	[22.76]	25.97
CO ₂	[9.95]	11.03
F	1.40	
- O=F ₂	0.59	
Total	94.19	100.00

(1) Luserna Valley, Piedmont, Italy; average of 18 electron microprobe analyses, supplemented by Raman spectroscopy, H₂O and CO₂ calculated from structure; corresponds to $(Y_{3.41}Dy_{0.16}Er_{0.15}Yb_{0.09}Gd_{0.07}Ca_{0.05}Pb_{0.02}Sm_{0.01})_{\Sigma=3.96}Al_{1.06}(CO_3)_{2.00}[(OH)_{10.35}F_{0.65}]_{\Sigma=11.00} \cdot 6H_2O$.

(2) $Y_4Al(CO_3)_2(OH)_{11} \cdot 6H_2O$.

Occurrence: A late-stage hydrothermal mineral in fractures in regionally metamorphosed gneiss.

Association: Aeschnite-(Y), albite, "chlorite," hematite, pyrite, quartz, titanite.

Distribution: From the Seccarezze quarries, Luserna San Giovanni, Torino, Piedmont, Italy.

Name: Named for the Luserna valley in which the first specimens were collected and a suffix of the chemical symbol of the dominant rare earth element.

Type Material: Natural History Museum, University of Pisa, Italy (19445) and the Regional Natural Science Museum, Torino, Italy (M/15901).

References: (1) Biagioni, C., E. Bonaccorsi, F. Cámara, M. Cadoni, M.E. Ciriotti, D. Bersani, and U. Kolitsch (2013) Lusernaite-(Y), $Y_4Al(CO_3)_2(OH,F)_{11} \cdot 6H_2O$, a new mineral species from Luserna Valley, Piedmont, Italy: Description and crystal structure. *Amer. Mineral.*, 98, 1322-1329.