

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_2O_3	6.11	6.39
Y_2O_3	43.52	56.61
La_2O_3	0.02	
Ce_2O_3	0.04	
Nd_2O_3	0.03	
Sm_2O_3	0.16	
Gd_2O_3	1.39	
Dy_2O_3	3.46	
Er_2O_3	3.15	
Yb_2O_3	2.09	
CaO	0.33	
PbO	0.37	
H_2O	[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, H_2O and CO_2 calculated from structure; corresponds to $(\text{Y}_{3.41}\text{Dy}_{0.16}\text{Er}_{0.15}\text{Yb}_{0.09}\text{Gd}_{0.07}\text{Ca}_{0.05}\text{Pb}_{0.02}\text{Sm}_{0.01})_{\Sigma=3.96}\text{Al}_{1.06}(\text{CO}_3)_{2.00}[(\text{OH})_{10.35}\text{F}_{0.65}]_{\Sigma=11.00}\cdot 6\text{H}_2\text{O}$.

(2) $\text{Y}_4\text{Al}(\text{CO}_3)_2(\text{OH})_{11}\cdot 6\text{H}_2\text{O}$.

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

Association: Aeschynite-(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), $\text{Y}_4\text{Al}(\text{CO}_3)_2(\text{OH},\text{F})_{11}\cdot 6\text{H}_2\text{O}$, a new mineral species from Luserna Valley, Piedmont, Italy: Description and crystal structure. *Amer. Mineral.*, 98, 1322-1329.