

Törnebohmite-(Ce)**(Ce, La)₂Al(SiO₄)₂(OH)**

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Crystal Data: Monoclinic, pseudohexagonal. *Point Group:* 2/*m*. Fine-grained, massive; as inclusions in cerite.

Physical Properties: Hardness = 4.5 D(meas.) = 4.94 D(calc.) = 5.12

Optical Properties: Semitransparent. *Color:* Light green to olive. *Luster:* Vitreous. *Optical Class:* Biaxial (+). *Pleochroism:* Very strong; *X* = light rose to greenish yellow; *Y* = bluish green; *Z* = light rose. *Dispersion:* *r* < *v*, very strong. *Absorption:* *Y* > *X* = *Z*. $\alpha = 1.808\text{--}1.845$ $\beta = 1.81\text{--}1.852$ $\gamma = 1.838\text{--}1.878$ 2*V*(meas.) = 20°–40°

Cell Data: *Space Group:* *P*2₁/*c*. *a* = 7.383(3) *b* = 5.673(3) *c* = 16.937(6) $\beta = 112.04(2)^\circ$ *Z* = 4

X-ray Powder Pattern: Bastnäs mine, Sweden.

3.08 (100), 2.82 (90), 2.01 (60), 2.18 (50), 1.783 (50), 4.57 (40), 3.53 (40)

Chemistry:

	(1)	(2)
SiO ₂	22.05	23.64
Al ₂ O ₃	8.55	10.03
(La, Nd) ₂ O ₃	34.85	
Ce ₂ O ₃	27.52	64.56
FeO	1.91	
MnO	0.05	
MgO	0.49	
CaO	0.23	
F	0.29	
H ₂ O		1.77
LOI	1.70	
insol.	0.95	
chalcophyrite	0.96	
Total	99.55	100.00

(1) Bastnäs mine, Sweden. (2) Ce₂Al(SiO₄)₂(OH).

Occurrence: In a contact metamorphosed limestone deposit (Bastnäs mine, Sweden).

Association: Allanite, cerite, bastnäsite.

Distribution: From the Bastnäs mine, Riddarhyttan, Västmanland, Sweden. In the Jamestown district, Boulder Co., and the Black Cloud pegmatite, Teller Co., Colorado, USA.

Name: For Alfred Elis Törnebohm (1838–1911), former Director of the Geological Survey of Sweden, and for its *cerium* content.

Type Material: n.d.

References: (1) Geijer, P. (1920) The cerium minerals of Bastnäs at Riddarhyttan. Swedish Geol. Sur., Yearbook, 14, 16–20. (2) (1921) Amer. Mineral., 6, 118–119 (abs. ref. 1). (3) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 319–320. (4) 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, 105. (5) Shen, J. and P.B. Moore (1982) Törnebohmite, RE₂Al(OH)[SiO₄]₂: crystal structure and genealogy of RE(III)Si(IV) $\rightleftharpoons$ Ca(II)P(V) isomorphisms. Amer. Mineral., 67, 1021–1028.