

Coskrenite-(Ce)**(Ce, Nd, La)₂(SO₄)₂(C₂O₄)·8H₂O**

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals are wedge-shaped tabular, to 1 mm, flattened on {100}, with {010} and {001}, typically in aggregates.

Physical Properties: *Cleavage:* On {001}, perfect. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.881 Soluble in H₂O.

Optical Properties: Transparent. *Color:* Very pale pink under incandescent light, pale blue under fluorescent room light; may be cream-white. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Orientation:* $Z' \wedge c = 21^\circ$ in {001}. *Dispersion:* $r > v$, medium. $\alpha = 1.544(4)$ $\beta = 1.578(4)$ $\gamma = 1.602(4)$ $2V(\text{meas.}) = 65(10)^\circ$ $2V(\text{calc.}) = 69(3)^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 6.007(1)$ $b = 8.368(2)$ $c = 9.189(2)$ $\alpha = 99.90(2)^\circ$ $\beta = 105.55(2)^\circ$ $\gamma = 107.71(2)^\circ$ $Z = 1$

X-ray Powder Pattern: Alum Cave Bluff, Tennessee, USA.

5.48 (100), 8.52 (70), 6.72 (60), 3.84 (60), 4.26 (50), 3.35 (40), 2.744 (40)

Chemistry:

	(1)		(1)
SO ₃	22.6	Sm ₂ O ₃	1.0
C ₂ O ₃	[10.2]	Eu ₂ O ₃	0.8
Y ₂ O ₃	0.1	Gd ₂ O ₃	0.3
La ₂ O ₃	4.6	F	0.3
Ce ₂ O ₃	25.9	H ₂ O	[20.4]
Pr ₂ O ₃	2.1	-O = F ₂	[0.1]
Nd ₂ O ₃	13.3	<hr/>	
		Total	[101.5]

(1) Alum Cave Bluff, Tennessee, USA; by electron microprobe, C₂O₃ and H₂O calculated from stoichiometry, original total given as 100.0%; corresponding to (Ce_{1.06}Nd_{0.56}La_{0.20}Pr_{0.09}Sm_{0.04}Eu_{0.03}Gd_{0.01}Y_{0.01})_{Σ=2.00}(SO₄)₂(C₂O₄)·8H₂O.

Occurrence: Formed by weathering of pyritiferous phyllite with evaporation of the resulting sulfate-rich solutions in soil, the rare earths probably derived from monazite and xenotime.

Association: Epsomite, apjohnite.

Distribution: From Alum Cave Bluff, Great Smoky Mountains National Park, Tennessee, USA.

Name: Honors Dr. T. Dennis Coskren (1942–), geologist and geochemist, Columbia, Maryland, USA, who studied the minerals of Alum Cave Bluff, Tennessee, USA.

Type Material: University of Michigan, Ann Arbor, Michigan; National Museum of Natural History, Washington, D.C., USA.

References: (1) Peacor, D.R., R.C. Rouse, and E.J. Essene (1999) Coskrenite-(Ce), (Ce, Nd, La)₂(SO₄)₂(C₂O₄)·8H₂O, a new rare-earth oxalate mineral from Alum Cave Bluff, Tennessee: characterization and crystal structure. *Can. Mineral.*, 37, 1453–1462. (2) (2000) *Amer. Mineral.*, 85, 1561 (abs. ref. 1).