

Oxammite

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Crystal Data: Orthorhombic. *Point Group:* 222. Rare in crystals, typically in lamellar and pulverulent masses.

Physical Properties: *Cleavage:* On {001}, distinct. *Hardness* = 2.5 *D*(meas.) = ~1.5 *D*(calc.) = 1.541 Soluble in H₂O.

Optical Properties: Transparent to opaque. *Color:* Colorless to pale yellow; colorless in transmitted light.

Optical Class: Biaxial (-). *Orientation:* *X* = *c*; *Y* = *a*; *Z* = *b*. *Dispersion:* *r* < *v*, distinct. $\alpha = 1.438$ $\beta = 1.547$ $\gamma = 1.595$ *2V*(meas.) = 62°

Cell Data: *Space Group:* P2₁2₁2 (synthetic). *a* = 8.035 *b* = 10.32 *c* = 3.801 *Z* = 2

X-ray Powder Pattern: Guañape Islands, Peru.
6.37 (10), 2.88 (8), 2.68 (8), 2.60 (8), 3.83 (7), 3.08 (7), 3.28 (6)

Chemistry:

	(1)	(2)	(3)
C ₂ O ₄	53.30	61.93	54.97
NH ₄	21.95	25.39	22.53
H ₂ O	24.75	12.68	22.50
Total	[100.00]	100.00	100.00

(1) Guañape Islands, Peru; recalculated to 100% after deduction of organic material 5.5%.

(2) (NH₄)₂C₂O₄ • H₂O. (3) (NH₄)₂C₂O₄ • 2H₂O.

Occurrence: Derived from bird or bat guano; in subfossil bird eggs and on subfossil birds.

Association: Mascagnite (Guañape Islands, Peru).

Distribution: From the Guañape Islands, south of Trujillo, Peru. In Petrogale Cave, near Madura, Western Australia. On Hamar an Nafur Island, Gulf of Masirah, Oman.

Name: As an OXalate of AMMonia.

Type Material: University of Virginia, Charlottesville, Virginia, apparently lost in a fire in 1916; Yale University, New Haven, Connecticut, USA.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 1103–1104. (2) Frondel, C. (1950) Notes on arcanite, ammonian apthitalite and arcanite. *Amer. Mineral.*, 35, 596–598. (3) Winchell, H. and R.J. Benoit (1951) Taylorite, mascagnite, apthitalite, lecontite, and oxammite from guano. *Amer. Mineral.*, 36, 590–601. (4) Taylor, J.C. and T.M. Sabine (1972) Isotope and bonding effects in ammonium oxalate monohydrate, determined by the combined use of neutron and X-ray diffraction analyses. *Acta Cryst.*, 28, 3340–3351. (5) (1957) NBS Circ. 539, 7, 5.