

Hoganite

$\text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot \text{H}_2\text{O}$

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Crystal Data: Monoclinic. *Point Group:* $2/m$. Isolated crystals are short prismatic, thick tabular, showing $\{110\}$, $\{10\bar{1}\}$, $\{01\bar{1}\}$, $\{2\bar{1}\bar{1}\}$, $\{1\bar{1}\bar{2}\}$, to 0.6 mm.

Physical Properties: *Cleavage:* On $\{001\}$, perfect; on $\{110\}$, distinct (synthetic).
Fracture: Conchoidal. *Tenacity:* Brittle. Hardness = 1.5 D(meas.) = n.d. D(calc.) = 1.910

Optical Properties: Transparent. *Color:* Dark bluish green. *Streak:* Pale blue.
Luster: Vitreous.

Optical Class: Biaxial (+) (synthetic). *Pleochroism:* Strong; X = blue; Y = pale blue; Z = pale bluish green. *Dispersion:* $r < v$, medium. *Absorption:* $X > Y > Z$. $\alpha = 1.533(2)$ $\beta = 1.541(3)$
 $\gamma = 1.554(2)$ $2V(\text{meas.}) = 85(5)^\circ$ $2V(\text{calc.}) = 76.8^\circ$

Cell Data: *Space Group:* $C2/c$. $a = 13.162(3)$ $b = 8.555(2)$ $c = 13.850(3)$
 $\beta = 117.08(3)^\circ$ Z = 8

X-ray Powder Pattern: Potosi pit, Australia.
6.921 (100), 3.532 (28), 6.176 (14), 3.592 (11), 5.382 (10), 2.278 (10), 5.872 (9)

Chemistry:	(1)	(2)
Cu	31.6	31.83
Fe	0.4	
C	23.85	24.06
H	3.95	4.04
O	[40.2]	40.07
Total	[100.0]	100.00

(1) Potosi pit, Australia; by AA, C and H by CHN analyzer, average of two analyses, O by difference; corresponds to $\text{Cu}_{1.00}\text{Fe}_{0.01}\text{C}_{4.00}\text{H}_{7.89}\text{O}_{5.07}$; equivalence to the synthetic compound was established by crystal-structure analysis. (2) $\text{Cu}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot \text{H}_2\text{O}$.

Occurrence: Formed in ferruginous gossan by reaction of oxidized zone metallic minerals with decaying vegetable matter provided by leaf litter and possibly mine timbers.

Association: Pateite, linarite, malachite, azurite, cuprian smithsonite, cerussite, goethite, hematite, quartz.

Distribution: From the Potosi Ag–Pb–Zn pit, two km northeast of Broken Hill, New South Wales, Australia.

Name: To honor Graham P. Hogan (1957–), Broken Hill, Australia, miner and collector of Broken Hill minerals, who found the first specimens.

Type Material: Broken Hill Geocentre, Broken Hill; Australian Museum, Sydney; Museum of Victoria, Melbourne, Australia, M47465.

References: (1) Hibbs, D.E., U. Kolitsch, P. Leverett, J.L. Sharpe, and P.A. Williams (2002) Hoganite and pateite, two new acetate minerals from the Potosi mine, Broken Hill, Australia. *Mineral. Mag.*, 66, 459–464. (2) de Meester, P., S.R. Fletcher, and A.C. Skapski (1973) Refined crystal structure of tetra- μ -acetato-bis-aquodicopper(II). *J. Chem. Soc., Dalton Transactions*, 2575–2578.