

Umohoite**(UO₂)Mo⁶⁺O₄·2H₂O**

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Crystal Data: Triclinic, pseudorhombohedral. *Point Group:* $\bar{1}$ or 1. Tabular plates, to 0.5 mm, in rosettes; also massive, in thin veinlets, and disseminated.

Physical Properties: *Cleavage:* On {001}, perfect. *Hardness* = n.d. *D(meas.)* = 4.53–4.66 *D(calc.)* = 4.523–4.457 *Radioactive.*

Optical Properties: Semitransparent to opaque. *Color:* Blue-black with dark green patches. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Pleochroism:* *X* = dark blue; *Y* = pale blue; *Z* = olive-green.

Orientation: *Y* = *b*; *X* \wedge *c* \simeq 9°05'; *Z* \simeq *a*. *Dispersion:* *r* > *v*. α = [1.66(1)] β = 1.831(5) γ = 1.915(5) *2V(meas.)* = 65(2)°

Cell Data: *Space Group:* $P\bar{1}$, with *a* = 6.3748(4) *b* = 7.5287(5) *c* = 14.628(1) α = 82.64(1)° β = 85.95(1)° γ = 89.91(1)° *Z* = 4, or *Space Group:* *P1*, with *a* = 6.372(3) *b* = 7.535(4) *c* = 14.69(3) α = 97.1° β = 85.9° γ = 90.07° *Z* = 4

X-ray Powder Pattern: Marysvale, Utah, USA; after heating to 50°C overnight, as the pattern changes with humidity and temperature, grinding, or X-ray bombardment.

4.13 (10), 3.20 (5), 3.15 (4), 12.2 (3), 6.18 (3), 2.07 (3), 3.11 (2)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
MoO ₃	28.23	34.80	30.89	MgO		1.00	
UO ₃	57.65	55.35	61.38	H ₂ O	14.	[8.85]	7.73
As ₂ O ₃	1.			Total		[100.00]	100.00

(1) Marysvale, Utah, USA. (2) Shinkolobwe, Congo; by electron microprobe, average of two analyses; H₂O by difference. (3) (UO₂)MoO₄·2H₂O, determined from crystal-structure analysis.

Occurrence: A rare secondary mineral, typically in sediment-hosted uranium-bearing deposits, formed in the oxidation zone above the water table.

Association: Uraninite, ilsemannite, jordisite, iriginite, schoepite, uranophane, rutherfordine, calcurmolite, fluorite, pyrite, gypsum, quartz.

Distribution: From the USA, from the Freedom No. 2 mine, Marysvale, Ohio district, Piute Co., Utah; at the Lucky Mc mine, Gas Hills, Fremont Co., Wyoming; and in the Alyce Tolino mine, Cameron district, Coconino Co., Arizona. At Shinkolobwe, Katanga Province, Congo (Shaba Province, Zaire). From the Rabéjac and Mas-d'Alary uranium deposits, south of Lodève, Hérault, France. At the Kyzylsai Mo-U deposit, Chu-Ili Mountains, southwestern Balkhash region, Kazakhstan. From unspecified localities in the former Soviet Union.

Name: For Uranium, Molybdenum, Hydrogen, and Oxygen in the composition.

Type Material: n.d.

References: (1) Brophy, G.P. and P.F. Kerr (1953) Hydrous uranium molybdate in Marysvale ore, a preliminary report; in: Annual Report for June 30, 1952 to April 1, 1953, U.S. Atomic Energy Comm. RME-3046, 45–51. (2) Frondel, C. (1958) Systematic mineralogy of uranium and thorium. U.S. Geol. Sur. Bull. 1064, 148–149. (3) Coleman, R.G. and D.E. Appleman (1957) Umohoite from the Lucky Mc mine, Wyoming. *Amer. Mineral.*, 42, 657–660. (4) Kamhi, S.R. (1959) An X-ray study of umohoite. *Amer. Mineral.*, 44, 920–925. (5) Hamilton, P.-K. and P.F. Kerr (1959) Umohoite from Cameron, Arizona. *Amer. Mineral.*, 44, 1248–1260. (6) Krivovichev, S.Y. and P.C. Burns (2000) Crystal chemistry of uranyl molybdates. I. The structure and formula of umohoite. *Can. Mineral.*, 38, 717–726. (7) Rastsvetaeva, R.K., A.V. Barinova, G.A. Sidorenko, and D.Y. Pushcharovskiy (2000) Crystal structure of triclinic umohoite [UMoO₆H₂O]·H₂O. *Doklady Acad. Nauk SSSR*, 373, 202–205.

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