

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Crystals, typically isolated, are short prismatic, pseudocubic or pseudododecahedral, to pyramidal, with prominent {112} and {010}, subsidiary {110}, and {012}, to 1 mm.

Physical Properties: *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = 4.5
D(meas.) = 4.86 D(calc.) = [5.32]

Optical Properties: Transparent. *Color:* Pale bottle-green, olive-green, brownish green, greenish black; greenish yellow to yellowish green in transmitted light. *Streak:* Pale green.

Luster: Vitreous.

Optical Class: Uniaxial (+). *Pleochroism:* *O* = green; *E* = yellowish green. $\omega = 2.19(2)$ (Li)
 $\epsilon = 2.21(2)$

Cell Data: *Space Group:* $I4_1/acd$. $a = 11.704$ $c = 14.895$ $Z = 16$

X-ray Powder Pattern: Goldfield, Nevada, USA.

3.17 (10), 1.61 (9), 3.32 (8), 4.95 (7), 2.72 (7), 2.21 (7), 3.75 (6)

Chemistry:

	(1)	(2)	(3)	(4)
TeO ₂	65.82	65.33	65.72	78.22
Fe ₂ O ₃	22.04	21.67	21.92	19.57
H ₂ O	12.14	13.00	12.36	2.21
Total	[100.00]	[100.00]	100.00	100.00

(1) Near Moctezuma, Mexico; recalculated to 100% from an original total of 99.53% after deduction of insoluble 12.69%. (2) Do.; recalculated to 100% from an original total of 98.98% after deduction of Al₂O₃ 1.00%, CaO 0.32%, and insoluble 4.68%. (3) Fe³⁺Te₃⁴⁺O₉•5H₂O. (4) Fe³⁺Te₂⁴⁺O₅(OH).

Occurrence: Of rare occurrence in the oxidized zone of Au–Te deposits, an alteration product of tellurium.

Association: Tellurium, tellurite, emmonsite, rodalquilarite, poughite, cliffordite, sonoraite, pyrite, alunite, barite, quartz.

Distribution: In the USA, at the Mohawk mine, and between the Jumbo and Clermont mines, Goldfield, Esmeralda Co., Nevada; in the Toughnut-Empire mine, Tombstone, Cochise Co., Arizona; at a prospect near the Lone Pine mine, Wilcox district, Catron Co., New Mexico; from the Klondike mine, Saguache Co., Colorado. In Mexico, at the Moctezuma (Bambolla) mine and the San Miguel and La Candelaria prospects, south of Moctezuma, and from Onovas, Sonora. In the El Indio mine, El Indio-Tambo district, east of La Serena, Coquimbo, Chile.

Name: For John William Mackay (1831–1902), Irish–American Comstock Lode mining magnate, in honor of his endowment of the School of Mines, University of Nevada, Reno, Nevada, USA.

Type Material: American Museum of Natural History, New York City, New York, T24594; Harvard University, Cambridge, Massachusetts, USA, 97444, 97950.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 642–643. (2) Gaines, R.V. (1965) Nuevos datos sobre mackayita. Bol. Soc. Geol. Mexicana, 28(2), 75–82 (in Spanish). (3) Pertlik, F. and A. Gieren (1977) Verfeinerung der Kristallstruktur von Mackayit, Fe(OH)[Te₂O₅]. Neues Jahrb. Mineral., Monatsh., 145–154 (in German with English abs.).