

**Crystal Data:** Monoclinic. *Point Group:* 2, 2/m, or m. As layered crusts of micaceous plates to ~40 μm.

**Physical Properties:** *Cleavage:* Perfect micaceous. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 2-3 D(meas.) = ~4.04 (porous material with trapped air) D(calc.) = 4.97

**Optical Properties:** Transparent. *Color:* Chocolate-brown. *Streak:* Copper-brown. *Luster:* Vitreous. *Optical Class:* Biaxial. *n* > 2.0 Non-pleochroic.

**Cell Data:** *Space Group:* P2, P2/m, or Pm. *a* = 10.757(3) *b* = 4.928(3) *c* = 8.942(2) β = 102.39(3)° *Z* = 2

**X-ray Powder Pattern:** Bambolla mine, Moctezuma, Sonora, Mexico. 3.267 (100), 2.52 (71), 4.361 (51), 1.762 (39), 4.924 (34), 2.244 (32), 1.455 (24)

Chemistry:	(1)	(2)	(3)	(4)
TeO <sub>3</sub>	48.60	51.31	51.93	53.60
SeO <sub>3</sub>	0.03	0.04	0.03	
SO <sub>3</sub>	0.11	0.24	0.09	
SiO <sub>2</sub>	1.10	0.04	<0.05	
CaO	9.74	9.25	11.65	17.12
Al <sub>2</sub> O <sub>3</sub>	0.28	1.99	1.05	
MnO <sub>2</sub>	28.15	22.01	28.30	26.54
Fe <sub>2</sub> O <sub>3</sub>	0.04	6.93	0.32	
ZnO	2.16	0.83	1.30	
CdO	0.07	0.12	0.09	
PbO	3.62	1.61	2.75	
Bi <sub>2</sub> O <sub>3</sub>	0.08	0.08	0.05	
H <sub>2</sub> O	[2.48]	[2.58]	[2.66]	2.75
Total	96.46	97.03	100.22	100.00

(1-3) Bambolla mine, Moctezuma, Sonora, Mexico; average electron microprobe analyses supplemented by IR, Raman and XANES spectroscopy, H<sub>2</sub>O calculated; for analysis (1) corresponds to Ca<sub>1.262</sub>Zn<sub>0.193</sub>Pb<sub>0.118</sub>Al<sub>0.040</sub>Fe<sub>0.004</sub>Cd<sub>0.004</sub>Bi<sub>0.002</sub>Mn<sub>2.353</sub>Te<sub>2.011</sub>So<sub>0.010</sub>Se<sub>0.002</sub>O<sub>12.421</sub>·H<sub>2</sub>O.

(4) Ca<sub>2</sub>Mn<sup>4+</sup><sub>2</sub>Te<sup>6+</sup><sub>2</sub>O<sub>12</sub>·H<sub>2</sub>O.

**Polymorphism & Series:** A possible series with kuranakhite.

**Occurrence:** From the weathering of an epithermal quartz-tellurium-gold vein system.

**Association:** Quartz, barite, jarosite, emmonsite, schmitterite, eztlite.

**Distribution:** From the Bambolla mine, Moctezuma, Sonora, Mexico.

**Name:** After the word *xocolatl* used by the Aztecs for a sacred beverage, known in English as chocolate, made by mixing cocoa, water, vanilla, pepper, and chili. The name alludes to the mineral's chocolate-brown color and Mexican provenance.

**Type Material:** Musée Cantonal de Géologie, Lausanne, Switzerland (MGL90740).

**References:** (1) Grundler, P.V., J. Brugger, N. Meisser, S. Ansermet, S. Borg, B. Etschmann, D. Testemale, and T. Bolin (2008) Xocolatlite, Ca<sub>2</sub>Mn<sup>4+</sup><sub>2</sub>Te<sup>6+</sup><sub>2</sub>O<sub>12</sub>·H<sub>2</sub>O, a new tellurate related to kuranakhite: Description and measurement of Te oxidation state by XANES spectroscopy. *Amer. Mineral.*, 93, 1911-1920.