Mcalpineite Cu_3TeO_6

Crystal Data: Cubic. *Point Group:* $2/m\,\bar{3}$. As sheaflike aggregates of fibrous to prismatic crystals, to 50 μm, in crusts.

Physical Properties: *Fracture:* Uneven. *Tenacity*: Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 6.65

Optical Properties: Translucent to transparent. *Color*: Emerald-green, olive-green, dark green. *Streak*: Paler green. *Luster*: Adamantine.
Optical Class: Isotropic. n = [2.01]

Cell Data: *Space Group: Ia*$\bar{3}$. a = 9.555(2) Z = 8

X-ray Powder Pattern: Synthetic Cu_3TeO_6 ICDD 22-251
2.753 (100), 1.686 (65), 1.437 (57), 2.384 (46), 1.066 (26), 1.094 (25), 4.770 (20)

Chemistry:	(1)	(2)	(3)
TeO_3	39.05	39.0	42.39
As_2O_5		0.8	
SiO_2	0.65	0.2	
NiO	0.17		
CuO	50.84	51.2	57.61
ZnO		3.1	
PbO	4.68		
H_2O	[4.61]	7.0	.
Total	[100.00]	101.3	100.00

(1) McAlpine mine, California, USA; average of 4 electron microprobe analyses, supplemented by IR spectroscopy, H_2O by difference; corresponds to $(Cu_{2.79}Pb_{0.09}Ni_{0.01})_{\Sigma=2.89}(Te_{0.97}Si_{0.05})_{\Sigma=1.02}O_{5.90} \bullet 1.10H_2O$. (2) Centennial Eureka mine, Utah, USA; average of 2 electron microprobe analyses, H_2O by CHN analyzer; corresponds to $(Cu_{2.56}Zn_{0.15})_{\Sigma=2.71}(Te_{0.88}Si_{0.02}As_{0.02})_{\Sigma=0.92}O_{5.47} \bullet 1.53H_2O$.
(3) Cu_3TeO_6; absence of structural OH^{1-} confirmed by micro-Raman spectroscopy.

Occurrence: A very rare secondary mineral, formed by alteration of tellurides and tellurium-bearing sulfides.

Association: Quartz, chromian muscovite, choloalite, keystoneite, mimetite, malachite, azurite, annabergite, pyrite, acanthite, hessite, "electrum", altaite, silver, galena, pyrargyrite, sphalerite, owyheeite (McAlpine mine, USA); xocomecatlite, jensenite, hinsdalite-svanbergite, goethite (Centennial Eureka mine, USA); paratellurite, weissite, quartz (Gambatesa mine, Italy).

Distribution: In the USA, from the McAlpine mine, Tuolumne Co., California, and at the Centennial Eureka mine, Tintic district, Juab Co., Utah. From the Gambatesa mine, Val Graveglia, eastern Liguria, Italy.

Name: For the locality at which the mineral originally was found, the McAlpine mine.

Type Material: The Natural History Museum, London, England (1992,374); Canadian Geological Survey, Ottawa, Canada (NMC 67163).

References: (1) Roberts, A.C., T.S. Ercit, A.J. Criddle, G.C. Jones, R.S. Williams, F.F. Cureton II, and M.C. Jensen (1994) Mcalpineite, $Cu_3TeO_6 \bullet H_2O$, a new mineral from the McAlpine mine, Tuolumne County, California, and from the Centennial Eureka mine, Juab Co., Utah. Mineral. Mag., 58, 417-424. (2) (1995) Amer. Mineral., 80, 630-631 (abs. ref. 1). (3) Carbone**,** C., R. Basso, R. Cabella, A. Martinelli, J.D. Grice**,** and G. Lucchetti (2013) Mcalpineite from the Gambatesa mine, Italy, and redefinition of the species. Amer. Mineral., 98, 1899-1905.