Parakhinite $PbCu_3Te^{6+}O_6(OH)_2$

Crystal Data: Hexagonal. *Point Group:* 3. Hexagonal crystals, may be equant, to 0.5 mm, showing {0001}, {11$\bar{2}$0}, and {11$\bar{2}$4}, prismatic to pyramidal. *Twinning:* Sectorial twinning observed in polarized light.

Physical Properties: *Cleavage:* On {0001}, fair. *Tenacity:* Brittle. Hardness = 3.5
D(meas.) = 6.5–7.0 D(calc.) = 6.302

Optical Properties: Semitransparent. *Color:* Dark green, bottle-green. *Streak:* Green. *Luster:* Vitreous.
Optical Class: Uniaxial (–). *Pleochroism:* O = yellowish green; E = emerald-green.
Dispersion: Strong. *Absorption:* $O > E$. $\omega = 2.155$ $\epsilon = 2.120$

Cell Data: *Space Group:* $P3_2$. $a = 5.765(2)$ $c = 18.001(9)$ Z = 3

X-ray Powder Pattern: Tombstone, Arizona, USA.
3.336 (10), 2.490 (10), 4.800 (8), 1.558 (8), 2.913 (7), 2.245 (6), 1.997 (5)

Chemistry:

	(1)	(2)	(3)
TeO_3	25.7	27.6	26.79
CuO	32.8	35.3	36.41
PbO	31.9	34.3	34.05
H_2O	7.8	[2.75]	2.75
Total	98.2	[100.0]	100.00

(1) Tombstone, Arizona, USA; traces of quartz noted as insoluble. (2) Analysis (1) recalculated to 100.0% with theoretical H_2O as determined by crystal-structure analysis; corresponding to $Pb_{1.04}Cu_{3.00}Te_{1.06}O_6(OH)_2$. (3) $PbCu_3TeO_6(OH)_2$.

Polymorphism & Series: Dimorphous with khinite.

Occurrence: A very rare secondary mineral formed under acid oxidizing conditions from gold–telluride ores in massive vein quartz.

Association: Dugganite, xocomecatlite, bromargyrite, other tellurium oxysalts.

Distribution: From the Emerald and Empire mines, Tombstone, Cochise Co., Arizona, USA.

Name: From the Greek for *near* and its dimorphous relation to *khinite*.

Type Material: Natural History Museum, Paris, France; The Natural History Museum, London, England, 1980,543; Harvard University, Cambridge, Massachusetts, 119094; National Museum of Natural History, Washington, D.C., USA, 164352.

References: (1) Williams, S.A. (1978) Khinite, parakhinite, and dugganite, three new tellurates from Tombstone, Arizona. Amer. Mineral., 63, 1016–1019. (2) Burns, P.C., M.A. Cooper, and F.C. Hawthorne (1995) Parakhinite, $Cu_3^{2+}PbTe^{6+}O_6(OH)_2$: crystal structure and revision of chemical formula. Can. Mineral., 33, 33–40.