

**Thorneite****Pb<sub>6</sub>(Te<sub>2</sub>O<sub>10</sub>)(CO<sub>3</sub>)Cl<sub>2</sub>(H<sub>2</sub>O)**

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Crystals exhibit {100}, {010}, {110}, and {211̄} as prismatic to bladed individuals to 0.5 mm with elongation and striations parallel to [001]. Typically, in parallel and random intergrowths.

**Physical Properties:** *Cleavage:* Good on {100}. *Tenacity:* Brittle. *Fracture:* Irregular to splintery. Hardness = 2 D(meas.) = n.d. D(calc.) = 6.790

**Optical Properties:** Transparent. *Color:* Yellow. *Streak:* Pale yellow. *Luster:* Adamantine. *Optical Class:* Biaxial (+). *a*, *β*, and *γ* in the range 2.01 to 2.03. 2V(meas.) = Large. *Orientation:* *Y* = *b*, *Z* ∧ *a* = 29° in obtuse *β*. *Pleochroism:* None.

**Cell Data:** *Space Group:* C2/c. *a* = 21.305(1) *b* = 11.059(1) *c* = 7.564(1) *β* = 101.112(4)° *Z* = 4

**X-ray Powder Pattern:** Bird Nest drift, Otto Mountain, San Bernardino County, California, USA. 3.224 (100), 3.351 (66), 2.900 (44), 2.133 (38), 10.43 (35), 3.595 (33), 3.093 (30)

<b>Chemistry:</b>	(1)	(2)
PbO	73.90	74.10
ZnO	0.03	
TeO <sub>3</sub>	20.35	19.43
Cl	2.29	3.92
H <sub>2</sub> O	[1.28]	1.00
CO <sub>2</sub>	[2.29]	2.44
- O = Cl	0.52	0.89
Total	99.62	100.00

(1) Bird Nest drift, Otto Mountain, San Bernardino County, California, USA; average of 3 electron microprobe analyses supplemented by Raman spectroscopy, H<sub>2</sub>O and CO<sub>2</sub> calculated from structure analysis; corresponds to (Pb<sub>5.94</sub>Zn<sub>0.01</sub>)(Te<sup>6+</sup><sub>2.08</sub>O<sub>10</sub>)(C<sub>1.00</sub>O<sub>3</sub>)[Cl<sub>1.16</sub>O<sub>0.34</sub>(OH)<sub>0.50</sub>](H<sub>2</sub>O).

(2) Pb<sub>6</sub>(Te<sup>6+</sup><sub>2</sub>O<sub>10</sub>)(CO<sub>3</sub>)Cl<sub>2</sub>(H<sub>2</sub>O).

**Occurrence:** A secondary phase on fracture surfaces and in small vugs in quartz veins. Formed from the partial oxidation of primary sulfides (e.g., galena) and tellurides (e.g., hessite) during or following brecciation of the quartz veins.

**Association:** Acanthite, cerussite, gold, hessite, iodargyrite, khinite, wulfenite, housleyite, markcooperite, ottoite.

**Distribution:** From the Bird Nest drift, southwest flank of Otto Mountain, ~2 km northwest of Baker, San Bernardino County, California, USA.

**Name:** Honors avid field collector, Brent *Thorne* (b. 1951) of Bountiful, Utah, the discoverer of the mineral.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (62257, 62258, 62259 and 62260).

**References:** (1) Kampf, A.R., R.M. Housley, and J. Marty (2010) Lead-tellurium oxysalts from Otto Mountain near Baker, California: III. Thorneite, Pb<sub>6</sub>(Te<sup>6+</sup><sub>2</sub>O<sub>10</sub>)(CO<sub>3</sub>)Cl<sub>2</sub>(H<sub>2</sub>O), the first mineral with edge-sharing octahedral tellurate dimers. *Amer. Mineral.*, 95, 1548-1553.