

**Bodieite****Bi<sup>3+</sup><sub>2</sub>(Te<sup>4+</sup>O<sub>3</sub>)<sub>2</sub>(SO<sub>4</sub>)**

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Displaying {001}, {110}, {111}, and {111<sup>-</sup>}, as sprays of acicular crystals, to 0.3 mm, occasionally steep pyramidal, or stepped tabular, elongated along [001].

**Physical Properties:** *Cleavage:* Fair on {001}. *Fracture:* Stepped, irregular. *Tenacity:* Brittle. Hardness = 2 D(meas.) = n.d. D(calc.) = 6.554 Soluble in dilute HCl.

**Optical Properties:** Transparent to translucent. *Color:* Colorless to yellow to olive-green. *Streak:* White. *Luster:* Subadamantine to greasy. *Optical Class:* Biaxial (-). All refractive indices greater than 2. 2V(meas.) = 71.5° *Orientation:* X = b.

**Cell Data:** Space Group: I2/a. a = 8.1033(8) b = 7.4302(8) c = 14.6955(17) β = 97.771(9)° Z = 4

**X-ray Powder Pattern:** Pittsburg-Liberty mine, Masonic district, Mono Co., California, USA. 3.243 (100), 3.331 (62), 2.716 (25), 1.9013 (21), 7.31 (20), 3.039 (20), 1.6620 (17)

<b>Chemistry:</b>	(1)	(2)
As <sub>2</sub> O <sub>3</sub>	1.58	
Sb <sub>2</sub> O <sub>3</sub>	0.25	
Bi <sub>2</sub> O <sub>3</sub>	52.14	53.85
TeO <sub>2</sub>	34.52	39.89
SO <sub>3</sub>	9.40	9.25
Total	97.89	100.00

(1) Dumps near the North Star mine, Tintic district, Juab Co., Utah, USA; average of 6 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to (Bi<sub>1.95</sub>Te<sub>1.89</sub>As<sub>0.14</sub>Sb<sub>0.02</sub>)Σ=4.00(S<sub>1.02</sub>O<sub>4</sub>)O<sub>6</sub>. (2) Bi<sup>3+</sup><sub>2</sub>(Te<sup>4+</sup>O<sub>3</sub>)<sub>2</sub>(SO<sub>4</sub>).

**Occurrence:** An oxidation-zone mineral in vugs in polymetallic (Au-Ag-Cu-Pb) vein deposits emplaced in contact-metamorphosed dolomite (Tintic) or a volcanogenic fault-breccia deposit emplaced in granodiorite (Pittsburg-Liberty mine).

**Association:** Mixite, pyrite, bismuthinite, barite, quartz (Tintic); goldfieldite, bismuthinite, famatinite-luzonite, barite, quartz, mixite, richelsdorfite (Pittsburg-Liberty mine).

**Distribution:** From dumps of the Pittsburg-Liberty mine, ~19 km north northwest of Bodie, Bodie Hills volcanic field, Masonic district, Mono Co., California and the Mine dumps near the North Star, Carisa, Boss Tweed, or Red Rose mines, Tintic district, Juab Co., Utah, USA.

**Name:** For the *Bodie* Hills volcanic field, in which the Pittsburg-Liberty mine, where some of the first specimens were collected, is located.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (67482, 67483-67486).

**References:** (1) Kampf, A.R., R.M. Housley, G.R. Rossman, J. Marty, and M. Chorazewicz (2018) Bodieite, Bi<sup>3+</sup><sub>2</sub>(Te<sup>4+</sup>O<sub>3</sub>)<sub>2</sub>(SO<sub>4</sub>), a new mineral from the Tintic District, Utah, and the Masonic District, California, USA. *Can. Mineral.*, 56(5), 763-772. (2) (2020) *Amer. Mineral.*, 105(7), 1110-1111 (abs. ref. 1).