Tellurobismuthite Bi_2Te_3

Crystal Data: Hexagonal. *Point Group:* $\overline{3}\,2/m$. As irregular plates and foliated masses.

Physical Properties: *Cleavage:* Perfect on {0001}. *Tenacity:* Laminae flexible but not elastic; slightly sectile. Hardness = 1.5–2 VHN = 51 (25 g load). D(meas.) = 7.815 D(calc.) = 7.857

Optical Properties: Opaque. *Color:* Pale lead-gray; in polished section, white. *Streak:* Pale lead-gray. *Luster:* Metallic, splendent on fresh cleavages. *Anisotropism:* Weak.
R_1–R_2: (400) 62.3–62.9, (420) 62.4–63.4, (440) 62.4–63.8, (460) 62.6–64.0, (480) 62.6–64.3, (500) 62.5–64.7, (520) 62.4–65.3, (540) 62.4–65.8, (560) 62.6–66.2, (580) 62.9–66.5, (600) 63.2–66.8, (620) 63.5–67.1, (640) 63.9–67.5, (660) 64.5–67.9, (680) 65.0–68.3, (700) 65.3–68.4

Cell Data: *Space Group:* $R\overline{3}m$. a = 4.3852 c = 30.483 Z = 3

X-ray Powder Pattern: Synthetic.
3.222 (100), 2.376 (25), 2.192 (25), 5.078 (8), 1.812 (8), 1.4901 (8), 2.031 (6)

Chemistry:

	(1)	(2)	(3)
Bi	53.07	51.99	52.20
Te	48.19	47.89	47.80
S		0.12	
Total	101.26	100.00	100.00

(1) Tellurium mine, Virginia, USA. (2) Oya mine, Japan. (3) Bi_2Te_3.

Polymorphism & Series: Forms a series with tellurantimony.

Mineral Group: Tetradymite group.

Occurrence: Typically formed in hydrothermal gold-quartz veins of low sulfur content.

Association: Gold, bismuth, gold tellurides, tetradymite, altaite, chalcopyrite, pyrrhotite.

Distribution: In the USA, from Field's vein, Dahlonega, Lumpkin Co., Georgia [TL]; in the Tellurium mine, Fluvanna Co., Virginia; in New Mexico, from the Little Mildred mine, near Hachita, Grant Co.; at the Campbell mine, Bisbee, Cochise Co., Arizona; in Colorado, from near Whitehorn, Fremont Co. and at the Little Gerald and Hamilton mines, Sierra Blanca, Huerfano, Costilla, and Alamosa Cos. In Canada, a number of minor occurrences, as at the Hunter mine, Khutze Inlet, near Swanson Bay; from the Lucky Jim mine, Quadra Island, and at the Ashloo mine, near Squamish, Howe Sound, British Columbia; from the Robb-Montbray mine, Montbray Township, and at the Horne mine, Noranda, Quebec. From the Uzelga copper deposit, Ural Mountains, Russia. At the Zhanatyube deposit, Kazakhstan. In Japan, in the Oya mine, Miyagi Prefecture; the Ojiri mine, Iwate Prefecture; the Suwa mine, Ibaragi Prefecture; and the Kiura mine, Oita Prefecture. At the Hol Kol Au–Cu mine, about 75 km southeast of Pyongyang, Suan Co., North Korea. From the Tuvatu Au–Ag–Te deposit, Viti Levu, Fiji Islands. At the Bulawan deposit, Negros Occidental, Phillipines. In Sweden, at Boliden, Västerbotten. In Wales, from the Clogau-St. Davids mine, Mangtall Mountains, Dollgelly, and the Vigra mine, Llanaker, Merionshire.

Name: For the composition.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 160–161. (2) Effenberger, H. and F. Pertlik (1987) Hydrothermal und Kristallstruktur von stochiometrischen Tellurantimon, Sb_2Te_3, und Tellurobismutit, Bi_2Te_3. Mitt. Österreichen Mineral. Ges., 132, 157–161 (in German with English abs.??). (3) (1964) NBS Mono. 25, 3, 16. (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 555.