

Cannonite

$\text{Bi}_2\text{O}(\text{SO}_4)(\text{OH})_2$

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Crystal Data: Monoclinic. *Point Group:* $2/m$. As equant to prismatic crystals, elongated along $[\bar{1}02]$, to 200 μm ; granular massive.

Physical Properties: *Fracture:* Uneven to conchoidal. *Tenacity:* Brittle. Hardness = 4 VHN = 183–280, 229 average (100 g load). D(meas.) = 6.5(1) (synthetic). D(calc.) = 6.515

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Adamantine. *Optical Class:* Biaxial. $\alpha = [1.91]$ $\beta = \text{n.d.}$ $\gamma = [1.99]$ $2V(\text{meas.}) = \text{n.d.}$

Cell Data: *Space Group:* $P2_1/c$. $a = 7.700(3)$ $b = 13.839(6)$ $c = 5.686(2)$
 $\beta = 109.11(3)^\circ$ $Z = 4$

X-ray Powder Pattern: Tunnel Extension mine, Utah, USA.
3.206 (100), 1.984 (90), 2.924 (70), 3.644 (60), 3.466 (60), 2.782 (50), 3.513 (40)

Chemistry:

	(1)	(2)
SO_3	14.18	14.20
Bi_2O_3	82.53	82.61
H_2O	[3.29]	3.19
Total	[100.00]	100.00

(1) Tunnel Extension mine, Utah, USA; by electron microprobe, average of ten analyses, recalculated from an elemental analysis; H_2O by difference, presence of $(\text{OH})^{1-}$ by analogy to the synthetic compound; then corresponding to $\text{Bi}_{1.99}\text{O}(\text{S}_{0.99}\text{O}_4)(\text{OH})_{2.08}$. (2) $\text{Bi}_2\text{O}(\text{SO}_4)(\text{OH})_2$.

Occurrence: An alteration product in a Cu–Bi–Au-sulfide deposit.

Association: Covellite, cuprobismutite, bismuthinite, quartz.

Distribution: In the USA, from the Tunnel Extension mine, Marysvale, Ohio district, Piute Co., Utah.

Name: Honors Benjamin Bartlett Cannon, V (1950–), amateur mineralogist of Seattle, Washington, USA, who recognized the first specimens.

Type Material: The Natural History Museum, London, England, 1992,239, 1992,240, and E.1456; Canadian Geological Survey, Ottawa, Canada, 67428.

References: (1) Stanley, C.J., A.C. Roberts, D.C. Harris, A.J. Criddle, and J.T. Szymański (1992) Cannonite, $\text{Bi}_2\text{O}(\text{OH})_2\text{SO}_4$, a new mineral from Marysvale, Utah, USA. *Mineral. Mag.*, 56, 605–609. (2) (1993) *Amer. Mineral.*, 78, 845 (abs. ref. 1). (3) Golič, L., M. Graunar, and F. Lazarni (1982) *catena*–Di– μ –hydroxo– μ_3 –oxo–dibismuth(III) sulphate. *Acta Cryst.*, 38, 2881–2883.