

Utahite

 $\text{Cu}_5\text{Zn}_3(\text{Te}^{6+}\text{O}_4)_4(\text{OH})_8 \cdot 7\text{H}_2\text{O}$

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$ or 1. Prismatic to thin tabular to bladed crystals, elongated along [001], showing {010} and {001}, in parallel to subparallel aggregates, to 0.6 mm, also as sheaves and bow-tie like groups.

Physical Properties: *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = ~4–5
D(meas.) = n.d. D(calc.) = 5.33

Optical Properties: Translucent. *Color:* Pale blue to blue-green. *Streak:* Pale blue.
Luster: Vitreous to pearly.
Optical Class: [Biaxial.] $n = [1.83\text{--}1.90]$ $\alpha = \text{n.d.}$ $\beta = \text{n.d.}$ $\gamma = \text{n.d.}$ $2V(\text{meas.}) = \text{n.d.}$

Cell Data: *Space Group:* $P\bar{1}$ or $P1$. $a = 8.794(4)$ $b = 9.996(2)$ $c = 5.660(2)$
 $\alpha = 104.10(2)^\circ$ $\beta = 90.07(5)^\circ$ $\gamma = 96.34(3)^\circ$ $Z = 1$

X-ray Powder Pattern: Centennial Eureka mine, Utah, USA.
9.638 (100), 4.841 (100), 2.747 (60), 8.736 (50), 2.600 (45), 6.862 (40), 6.172 (40)

Chemistry:	(1)	(2)
TeO ₃	45.47	45.54
CuO	25.76	25.78
ZnO	15.81	15.83
H ₂ O	[12.96]	12.85
Total	[100.00]	100.00

(1) Centennial Eureka mine, Utah, USA; by electron microprobe, average of six analyses, H₂O by difference, total Te as TeO₃, (OH)¹⁻ and H₂O confirmed by IR; corresponds to Cu_{4.98}Zn_{2.99}(TeO₄)_{3.98}(OH)₈•7.1H₂O. (2) Cu₅Zn₃(TeO₄)₄(OH)₈•7H₂O.

Occurrence: A very rare secondary mineral found on dump material from the oxidized zone of a Cu–Zn–Te-bearing hydrothermal ore deposit.

Association: Cesbronite, quartz.

Distribution: From the mine dumps of the Centennial Eureka mine, Tintic district, Juab Co., Utah, USA.

Name: After the state of Utah, USA, where the mineral was discovered.

Type Material: Canadian Geological Survey, Ottawa, Canada, 67415; The Natural History Museum, London, England, 1994,99.

References: (1) Roberts, A.C., J.A.R. Stirling, A.J. Criddle, M.C. Jensen, E.A. Moffatt, and W.E. Wilson (1997) Utahite, a new mineral and associated copper tellurates from the Centennial Eureka mine, Tintic district, Juab County, Utah. *Mineral. Record*, 28, 175–179. (2) (1998) *Amer. Mineral.*, 83, 187–188 (abs. ref. 1).