

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As isolated grains and intimately intergrown with pavonite or benjaminite or both, to 300  $\mu\text{m}$ .

**Physical Properties:** *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle.  
D(meas.) = n.d. D(calc.) = 6.74 *Hardness* = 3.5 VHN = 190 (50 g load).

**Optical Properties:** Opaque. *Color:* Grayish white in both plain and reflected light. *Streak:* n.d.  
*Luster:* Metallic. *Anisotropism:* Distinct, bluish gray to brownish gray. *Pleochroism:* Distinct, shades of gray.

*Optical Class:* n.d.

R<sub>1</sub>-R<sub>2</sub>: (470) 41.5-48.3, (546) 40.9-47.0, (589) 40.4-46.6, (650) 39.9-46.1

**Cell Data:** *Space Group:* C2/m. *a* = 13.380(3) *b* = 4.0492(9) *c* = 18.690(4)  $\beta$  = 105.494(4) $^\circ$   
Z = 1

**X-ray Powder Pattern:** Erzwies mining district, province of Salzburg, Austria.  
2.861 (100), 3.452 (90), 3.578 (58), 3.331 (36), 3.301 (40), 2.025 (25), 2.225 (24)

Chemistry:	(1)	(2)
Cu	1.68	
Ag	11.56	13.61
Pb	4.64	
Bi	63.82	68.58
Te	0.34	
S	17.52	17.81
Total	99.57	100.00

(1) Erzwies mining district, province of Salzburg, Austria; average of 37 electron microprobe analyses; corresponds to Cu<sub>1.06</sub>Ag<sub>4.24</sub>Pb<sub>0.9</sub>Bi<sub>12.23</sub>S<sub>21.89</sub>Te<sub>0.11</sub>. (2) Ag<sub>5</sub>Bi<sub>13</sub>S<sub>22</sub>.

**Occurrence:** From mineralized (metallic sulfosalts) hydrothermal quartz veins.

**Association:** Bismuthinite, krupkaite, pavonite, benjaminite, gustavite, heyrovskyite, cosalite, and traces of tetradymite, native gold, pyrite.

**Distribution:** From the Erzwies mining district, Hohe Tauern region, west of the Gasteinertal, province of Salzburg, Austria.

**Name:** Honors Dr. Dan Topa (b. 1955), ore mineralogist and crystallographer, University of Salzburg, Austria, for his work on sulfosalt crystal chemistry and structures.

**Type Material:** Department of Materials Research and Physics (Division of Mineralogy), University of Salzburg, Austria.

**References:** (1) Makovicky, E., W.H. Parr, H. Putz, and G. Zagler (2010) Dantopaite, Ag<sub>5</sub>Bi<sub>13</sub>S<sub>22</sub>, the <sup>6</sup>P natural member of the pavonite homologous series, from Erzwies, Austria. Can. Mineral., 48, 467-481. (2) (2011) Amer. Mineral., 96, 939-940 (abs. ref. 1).