

# Gallobeutantite

# PbGa<sub>3</sub>(AsO<sub>4</sub>, SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>

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**Crystal Data:** Hexagonal. *Point Group:* 3*m*. Isolated crystals are rhombohedra, to nearly 1 mm, may be modified by {0001}, discoidal, strongly compositionally zoned; in subparallel aggregates.

**Physical Properties:** *Fracture:* Even to conchoidal. *Tenacity:* Brittle. Hardness = 4  
D(meas.) = n.d. D(calc.) = 4.87 [AsO<sub>4</sub>:SO<sub>4</sub> = 1:1].

**Optical Properties:** Transparent. *Color:* Pale yellow, pale green, cream-white. *Streak:* White to pale yellow. *Luster:* Vitreous.

*Optical Class:* Uniaxial (-).  $\omega = 1.763(5)$   $\epsilon = 1.750(5)$

**Cell Data:** *Space Group:* R3*m*.  $a = 7.225(4)$   $c = 17.03(2)$   $Z = 3$

**X-ray Powder Pattern:** Tsumeb, Namibia.

3.038 (100), 5.85 (90), 3.59 (40), 2.271 (40), 2.851 (30), 2.513 (30), 1.948 (30)

## Chemistry:

	(1)	(2)
SO <sub>3</sub>	9.5	10.63
P <sub>2</sub> O <sub>5</sub>	0.1	
As <sub>2</sub> O <sub>5</sub>	18.0	15.25
GeO <sub>2</sub>	0.1	
Al <sub>2</sub> O <sub>3</sub>	4.5	
Fe <sub>2</sub> O <sub>3</sub>	8.9	
Ga <sub>2</sub> O <sub>3</sub>	19.3	37.32
ZnO	1.1	
PbO	31.0	29.63
CaO	0.0	
H <sub>2</sub> O	[7.3]	7.17
Total	[99.8]	100.00

(1) Tsumeb, Namibia; by electron microprobe, average of six analyses, total Fe as Fe<sub>2</sub>O<sub>3</sub>, H<sub>2</sub>O calculated from stoichiometry; corresponds to Pb<sub>1.04</sub>(Ga<sub>1.49</sub>Fe<sub>0.82</sub><sup>3+</sup>Al<sub>0.62</sub>Zn<sub>0.10</sub>Ge<sub>0.02</sub>)<sub>Σ=3.05</sub> [(AsO<sub>4</sub>)<sub>1.14</sub>(SO<sub>4</sub>)<sub>0.86</sub>]<sub>Σ=2.00</sub>(OH)<sub>5.94</sub>. (2) PbGa<sub>3</sub>(AsO<sub>4</sub>, SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub> with AsO<sub>4</sub>:SO<sub>4</sub> = 1:1.

**Mineral Group:** Beudantite group.

**Occurrence:** A rare secondary mineral in vugs in oxidized ore from a dolostone-hosted hydrothermal polymetallic ore deposit.

**Association:** Stolzite, mercurian silver, otjissimeite, gallian beudantite, gallian hidalgoite, scorodite, hematite, goethite, reniérite, gallite, gallian tennantite, chalcocite.

**Distribution:** From Tsumeb, Namibia.

**Name:** For its predominant *gallium* content as a member of the *beudantite* group.

**Type Material:** Canadian Museum of Nature, Ottawa, 81518; Canadian Geological Survey, Ottawa, Canada.

**References:** (1) Jambor, J.L., D.R. Owens, J.D. Grice, and M.N. Feinglos (1996) Gallobeutantite, PbGa<sub>3</sub>[(AsO<sub>4</sub>), (SO<sub>4</sub>)<sub>2</sub>](OH)<sub>6</sub>, a new mineral species from Tsumeb, Namibia, and associated new gallium analogues of the alunite – jarosite family. *Can. Mineral.*, 34, 1305–1315. (2) (1997) *Amer. Mineral.*, 82, 1039 (abs. ref. 1).