

**Galloplumbogummite****Pb(Ga,Al)<sub>3-x</sub>Ge<sub>x</sub>H<sub>1-x</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>**  $0 \leq x \leq 1$ 

**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3} 2/m$ . As rhombohedral crystals, to 0.15 mm.

**Physical Properties:** *Cleavage:* n.d. *Fracture:* n.d. *Tenacity:* n.d. *Hardness* = n.d.  
 $D(\text{meas.}) = \text{n.d.}$   $D(\text{calc.}) = 4.62$

**Optical Properties:** Transparent. *Color:* Colorless, frosted white. *Streak:* White. *Luster:* n.d.  
*Optical Class:* Uniaxial (+).  $n(\text{calc.}) = 1.82$

**Cell Data:** *Space Group:*  $R\bar{3} m$ .  $a = 7.083(5)$   $c = 16.742(3)$   $Z = 3$

**X-ray Powder Pattern:** Tsumeb mine, Tsumeb, Namibia.  
5.730 (100), 2.983 (78), 3.528 (24), 2.225 (19), 1.912 (17), 1.768 (15), 2.466 (12)

<b>Chemistry:</b>	(1)
PbO	34.45
CaO	0.42
Al <sub>2</sub> O <sub>3</sub>	10.19
Ga <sub>2</sub> O <sub>3</sub>	19.64
GeO <sub>2</sub>	5.93
Fe <sub>2</sub> O <sub>3</sub>	0.20
P <sub>2</sub> O <sub>5</sub>	20.04
SO <sub>3</sub>	1.71
H <sub>2</sub> O	[7.42]
Total	100.00

(1) Tsumeb mine, Tsumeb, Namibia; average of 14 electron microprobe analyses supplemented by Raman spectroscopy, H<sub>2</sub>O by difference; corresponding to  $(\text{Pb}_{1.04}\text{Ca}_{0.05})_{\Sigma=1.09}(\text{Ga}_{1.41}\text{Al}_{1.35}\text{Ge}_{0.38}\text{Fe}_{0.02})_{\Sigma=3.16}(\text{P}_{1.91}\text{S}_{0.14})_{\Sigma=2.05}\text{O}_{8.44}(\text{OH})_{5.56}$ .

**Mineral Group:** Alunite supergroup, plumbogummite subgroup.

**Occurrence:** A secondary mineral derived by alteration of Ge-Ga minerals in the oxidized zone of a dolostone-hosted, polymetallic, hydrothermal deposit.

**Association:** Germanite-renierite, chalcocite, Cd-rich sphalerite, galena, pyrite.

**Distribution:** From the Second oxidation zone, Tsumeb mine, Tsumeb, Otjikoto Region, Namibia.

**Name:** Reflects dominant essential gallium and the mineral's structural relation to *plumbogummite*.

**Type Material:** Mineralogical Museum, University of Hamburg, Germany (TS 531).

**References:** (1) Schlueter, J., T. Malcherek, and B. Mihailova (2014) Galloplumbogummite from Tsumeb, Namibia, a new member of the alunite group with tetravalent charge balance. *N. Jb. Miner. Abh.*, 191(3), 301-309. (2) (2016) Amer. Mineral., 101, 1492-1493 (abs. ref. 1).