

**Plumboagardite**

**Crystal Data:** Hexagonal. *Point Group:* 6/m. As acicular crystals to 0.05 mm in radial fibrous spherulitic aggregates to 0.12 mm.

**Physical Properties:** *Cleavage:* None. *Fracture:* n.d. *Tenacity:* n.d. *Hardness* = 3  
D(meas.) = n.d. D(calc.) = 3.471 Dissolves in dilute HCl.

**Optical Properties:** Translucent. *Color:* Grass-green. *Streak:* Greenish. *Luster:* Vitreous.  
*Optical Class:* Uniaxial (+).  $\omega = 1.726(5)$   $\varepsilon = 1.805(5)$

**Cell Data:** Space Group: *P6<sub>3</sub>/m*.  $a = 13.77(2)$   $c = 5.94(1)$   $Z = 2$

**X-ray Powder Pattern:** Aitern-Süd mine, near Schönau, Baden-Württemberg, Germany.  
12.01 (100), 3.60 (80), 2.49 (70), 4.51 (60), 2.98 (60), 3.31 (50), 2.74 (50)

<b>Chemistry:</b>	(1)
PbO	8.99
La <sub>2</sub> O <sub>3</sub>	1.91
Nd <sub>2</sub> O <sub>3</sub>	1.17
Ce <sub>2</sub> O <sub>3</sub>	0.96
Sm <sub>2</sub> O <sub>3</sub>	0.20
Pr <sub>2</sub> O <sub>3</sub>	0.19
Gd <sub>2</sub> O <sub>3</sub>	0.17
Dy <sub>2</sub> O <sub>3</sub>	0.10
Y <sub>2</sub> O <sub>3</sub>	0.96
CaO	1.44
CuO	40.49
Fe <sub>2</sub> O <sub>3</sub>	1.54
As <sub>2</sub> O <sub>5</sub>	29.74
P <sub>2</sub> O <sub>5</sub>	0.30
SiO <sub>2</sub>	1.46
<u>H<sub>2</sub>O</u>	<u>[10.38]</u>
Total	100.00

(1) Aitern-Süd mine, near Schönau, Baden-Württemberg, Germany; average of 3 electron microprobe analyses, H<sub>2</sub>O by difference; corresponds to [Pb<sub>0.44</sub>(La<sub>0.13</sub>Nd<sub>0.08</sub>Ce<sub>0.06</sub>Pr<sub>0.01</sub>Sm<sub>0.01</sub>Gd<sub>0.01</sub>Dy<sub>0.01</sub>Y<sub>0.09</sub>)<sub>Σ=0.40</sub>Ca<sub>0.28</sub>]<sub>Σ=1.12</sub>(Cu<sub>5.59</sub>Fe<sub>0.21</sub>)<sub>Σ=5.80</sub>(As<sub>2.84</sub>Si<sub>0.27</sub>P<sub>0.05</sub>)<sub>Σ=3.16</sub>O<sub>12</sub>(OH)<sub>6</sub>•3.33H<sub>2</sub>O.

**Mineral Group:** Mixite group.

**Occurrence:** Formed in the oxidized zone of hydrothermal Pb-Zn vein deposits, the product of alteration of primary Pb, Cu, REE, and As minerals.

**Association:** Fluorite, limonite, chrysocolla, quartz.

**Distribution:** From waste dumps of the Aitern-Süd mine, near Schönau, Baden-Württemberg, Germany. From the Miedzianka-Ciechanowice deposits, Rudawy Janowickie Mountains, Lower Silesia, Poland.

**Name:** As the lead (*plumbo*) analog of *agardite*.

**Type Material:** Natural History Museum, Stuttgart, Germany.

**References:** (1) Walenta, K. and T. Theye (2005) Plumboagardite, a new mineral of the mixite group from an occurrence in the Southern Black Forest, Germany. *N. Jb. Mineral. Abh.*, 181(3), 219-222. (2) (2006) *Amer. Mineral.*, 91, 713 (abs. ref. 1). (3) Siudi, R. and B. Golebiowska (2011) New data on supergene minerals from the Miedzianka-Ciechanowice deposits in the Rudawy Janowickie Mountains, Lower Silesia, Poland. *Przeład Geologiczny*, 59(3), 226-234.