

**Bechererite****Zn<sub>7</sub>Cu[SiO(OH)<sub>3</sub>]SO<sub>4</sub>(OH)<sub>13</sub>**

©2001-2005 Mineral Data Publishing, version 1

**Crystal Data:** Hexagonal. *Point Group:* 3. Steep trigonal hemimorphic crystals, to 0.25 mm, with {12 $\bar{3}$ 0}, {24 $\bar{6}$ 1}, {62 $\bar{8}$ 1}, and {000 $\bar{1}$ }.

**Physical Properties:** *Cleavage:* On {0001}. *Tenacity:* Brittle. *Hardness* = 2–3  
D(meas.) = 3.45(5) D(calc.) = 3.51

**Optical Properties:** Semitransparent. *Color:* Colorless, pale blue, ice-green, pale green.  
*Streak:* White. *Luster:* Vitreous.  
*Optical Class:* Uniaxial (-).  $\omega = 1.705(1)$   $\epsilon = 1.611(1)$

**Cell Data:** *Space Group:* P3.  $a = 8.319(2)$   $c = 7.377(1)$   $Z = 1$

**X-ray Powder Pattern:** Tonopah-Belmont mine, Arizona, USA.  
7.37 (100), 2.556 (50), 3.282 (30), 2.724 (30), 3.623 (25), 1.572 (20), 2.191 (15)

<b>Chemistry:</b>	(1)
	SO <sub>3</sub> 9.5
	SiO <sub>2</sub> 6.1
	CuO 8.6
	ZnO 60.6
	H <sub>2</sub> O [15.2]
	<hr/>
	Total [100.0]

(1) Tonopah-Belmont mine, Arizona, USA; by electron microprobe, average of five analyses, H<sub>2</sub>O by difference; corresponds to Zn<sub>6.93</sub>Cu<sub>1.01</sub>[Si<sub>0.95</sub>O(OH)<sub>3</sub>]S<sub>1.10</sub>O<sub>4</sub>(OH)<sub>13</sub>.

**Occurrence:** A very rare secondary mineral in the oxidized zone of a hydrothermal base-metal deposit (Tonopah-Belmont mine, Arizona, USA); a post-mine mineral (Frongoch mine, Wales).

**Association:** Rosasite, willemite, hydrozincite, smithsonite, paratacamite, boleite (Tonopah-Belmont mine, Arizona, USA); susannite, hemimorphite, namuwite, cerussite (Frongoch mine, Wales).

**Distribution:** From the Tonopah-Belmont mine, Osborne district, Maricopa Co., Arizona, USA. In Wales, in Dyfed, at the Frongoch mine and from the Nantycagl (Eaglebrook) and Esgair Hir mines, Ceulanymaesmawr. At Broken Hill, New South Wales, Australia;

**Name:** To honor Dr. Karl Becherer (1926–), University of Vienna, Vienna, Austria, for his work on the related mineral spangolite.

**Type Material:** Institute for Mineralogy and Crystallography, University of Vienna, 8B/10-030#1; Natural History Museum, Vienna, Austria, M6789.

**References:** (1) Giester, G. and B. Rieck (1996) Bechererite, (Zn, Cu)<sub>6</sub>Zn<sub>2</sub>(OH)<sub>13</sub> [(S, Si)(O, OH)<sub>4</sub>]<sub>2</sub>, a novel mineral species from the Tonopah-Belmont mine, Arizona. *Amer. Mineral.*, 81, 244–248. (2) Hoffmann, C., T. Armbruster, and G. Giester (1997) Acentric structure (P3) of bechererite, Zn<sub>7</sub>Cu(OH)<sub>13</sub>[SiO(OH)<sub>3</sub>SO<sub>4</sub>]. *Amer. Mineral.*, 82, 1014–1018. (3) Green, D.I., S.A. Rust, and J.S. Mason (1996) Frongoch mine, Dyfed. *UK J. of Mines & Minerals*, 17, 29–38.