

Vonbezingite

$\text{Ca}_6\text{Cu}_3(\text{SO}_4)_3(\text{OH})_{12}\cdot 2\text{H}_2\text{O}$

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Crystal Data: Monoclinic. *Point Group:* $2/m$. As crystals, elongated along [001], to 3 cm, showing {110}, {010}, {100} {111}, {101}. *Twining:* On {001}, twinned by merohedry.

Physical Properties: *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = ~ 4
D(meas.) = 2.82(2) D(calc.) = 2.81–2.83

Optical Properties: Semitransparent. *Color:* Dark blue. *Streak:* Pale blue. *Luster:* Vitreous on fractures, subvitreous on crystal faces.

Optical Class: Biaxial (-). *Pleochroism:* Strong; X = pale blue; Y = grayish blue; Z = dark blue. *Orientation:* X = b; Y \wedge a = 30.2° ; Z \wedge c = -11.5° . *Dispersion:* $r > v$, moderate.
 $\alpha = 1.590(2)$ $\beta = 1.610(3)$ $\gamma = 1.619(2)$ $2V(\text{meas.}) = 65(5)^\circ$ $2V(\text{calc.}) = 67^\circ$

Cell Data: *Space Group:* $P2_1/c$. $a = 15.122(2)$ $b = 14.358(1)$ $c = 22.063(4)$
 $\beta = 108.68(1)^\circ$ Z = 8

X-ray Powder Pattern: Wessels mine, South Africa.

3.393 (100), 3.120 (85), 3.188 (65), 3.098 (57), 3.368 (55), 3.200 (53), 2.769 (41)

Chemistry:

	(1)	(2)
SO ₃	24.0	25.04
CuO	25.5	24.87
CaO	35.4	35.07
H ₂ O	15.6	15.02
Total	100.5	100.00

(1) Wessels mine, South Africa; by electron microprobe, average of six analyses, H₂O by TGA-mass spectrometry; corresponds to $\text{Ca}_{6.03}\text{Cu}_{3.07}(\text{SO}_4)_{2.87}(\text{OH})_{12.46}\cdot 2.06\text{H}_2\text{O}$. (2) $\text{Ca}_6\text{Cu}_3(\text{SO}_4)_3(\text{OH})_{12}\cdot 2\text{H}_2\text{O}$.

Occurrence: A very rare mineral formed during a period of evaporation of surface or ground waters at ambient temperature and atmospheric pressure.

Association: Barite, azurite, sturmanite, calcite, gypsum, bultfonteinite.

Distribution: From the Wessels mine, near Kuruman, Cape Province, South Africa.

Name: To honor Karl-Ludwig von Bezing (1945–), Austrian-South African mineral collector, for his contributions to knowledge of mineralogy of the Kalahari manganese field.

Type Material: American Museum of Natural History, New York, New York, USA, T100748.

References: (1) Dai, Y. and G.E. Harlow (1992) Description and crystal structure of vonbezingite, a new Ca–Cu–SO₄–H₂O mineral from the Kalahari manganese field, South Africa. *Amer. Mineral.*, 77, 1292–1300.