

Crystal Data: Orthorhombic. *Point Group:* 222. Typically stalactitic or in efflorescent crusts; fibrous, granular or massive.

Physical Properties: *Cleavage:* On {010}, perfect. *Tenacity:* Brittle. Hardness = 2-2.5
D(meas.) = 1.98(5) D(calc.) = 1.972 Soluble in H₂O, taste astringent, metallic, nauseous;
dehydrates in air; strongly diamagnetic.

Optical Properties: Transparent. *Color:* Colorless, white; pale shades of blue, green, or brown from impurities; colorless in transmitted light. *Luster:* Vitreous, silky if fibrous.

Optical Class: Biaxial (-). $\alpha = 1.463$ $\beta = 1.475$ $\gamma = 1.480$ 2V(meas.) = Small to moderate.
Orientation: X = b; Y = c; Z = a. *Dispersion:* r > v, weak.

Cell Data: *Space Group:* P2₁2₁2₁. a = 11.779 b = 12.050 c = 6.822 Z = 4

X-ray Powder Pattern: Synthetic.

4.21 (100), 5.36 (80), 4.18 (50), 5.29 (35), 2.867 (35), 2.651 (30), 4.46 (25)

Chemistry:	(1)	(2)
SO ₃	27.29	27.84
FeO	1.12	
MnO	1.24	
NiO	0.06	
ZnO	23.12	28.30
MgO	0.81	
H ₂ O	42.42	43.86
<u>insol.</u>	<u>3.65</u>	<u> </u>
Total	99.71	100.00

(1) Ushaw Moor, Durham, England. (2) ZnSO₄·7H₂O.

Polymorphism & Series: Forms a series with epsomite.

Occurrence: A secondary mineral in oxidized portions of zinc sulfide deposits, particularly as coatings on walls of mine passages.

Association: Epsomite, melanterite, pickeringite, chalcantite, gypsum.

Distribution: Widespread as post-mining efflorescences. A few notable localities include: in Germany, from the Rammelsberg mine, near Goslar, Harz Mountains, and at Freiberg and Altenberg, Saxony. From Baňská Stiavnica (Schemnitz), Slovakia. At Falun, Sweden. From Sain-Bel, near Lyon, Rhône, France. At the Almagrera mine, Tharsis, Huelva Province, Spain. In Italy, at Capanne Vecchie, Elba, and Raibl, Venezia Giulia. At Broken Hill, New South Wales, Australia. In the USA, in Arizona, at Bisbee, Cochise Co. and many other districts; from the Central district, Grant Co., New Mexico; at Island Mountain, Trinity Co., California; from Butte, Silver Bow Co., Montana; at Bingham Canyon, Salt Lake Co., Utah; in the Comstock Lode, Storey Co., Nevada; at Friedensville, Lehigh Co., Pennsylvania. From Quebrada de La Alcaparrosa, San Juan Province, Argentina.

Name: For the locality at *Goslar*, Germany.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 513-516. (2) (1959) NBS Circ. 539, 8, 71-73. (3) Anderson, J.L., R.C. Peterson, I.P. Swanson (2005) Combined neutron powder diffraction and X-ray single-crystal structure refinement of the atomic structure and hydrogen bonding of goslarite (ZnSO₄·7H₂O). Mineral. Mag., 69, 259-271. (4) (2006) Amer. Mineral., 91(1), 221 (abs. ref. 3).