

Zaherite**Al₁₂(SO₄)₅(OH)₂₆•20H₂O**

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$ or 1. Fibers, which may be tubular, with a wavy texture, to hundreds of μm , in dense extremely fine-grained aggregates.

Physical Properties: *Cleavage:* One, well-developed. Hardness = ~ 3.5 , in aggregates. $D(\text{meas.}) = 2.007\text{--}2.011$ $D(\text{calc.}) = 2.01$ Reversibly hydrates at room temperature, with changes in the most intense X-ray diffraction peak position.

Optical Properties: Semitransparent. *Color:* Chalk-white to pale bluish green; colorless in transmitted light. *Luster:* Pearly to earthy.

Optical Class: Biaxial (+), with extremely low birefringence, ~ 0.001 . $\alpha = 1.498(1)$ $\beta = \text{n.d.}$ $\gamma = 1.499(1)$ $2V(\text{meas.}) = \text{Moderate}$.

Cell Data: *Space Group:* $P\bar{1}$ or $P1$. $a = 18.475(0.942)$ $b = 19.454(0.591)$ $c = 3.771(0.231)$ $\alpha = 95^\circ 14.40'(1^\circ 6.60')$ $\beta = 91^\circ 21.80'(2^\circ 7.38')$ $\gamma = 80^\circ 14.40'(1^\circ 9.24')$ $Z = 1$

X-ray Powder Pattern: Punjab Salt Range, Pakistan.

17.9 (100), 3.22 (8), 4.61 (7), 4.58 (7), 4.56 (7), 3.55 (6), 9.5 (5), 4.82 (5)

Chemistry:

	(1)	(2)	(3)
SO ₃	24.87	24.63	24.92
P ₂ O ₅	0.02	0.06	
CO ₂	0.00		
SiO ₂	0.63	0.11	
Al ₂ O ₃	37.79	37.85	38.08
Fe ₂ O ₃		0.08	
MnO		0.01	
MgO	0.01	0.19	
CaO	0.09	0.21	
Na ₂ O	0.03	0.08	
K ₂ O	0.01	0.01	
H ₂ O	36.55	36.05	37.00
Total	100.00	99.28	100.00

(1) Punjab Salt Range, Pakistan; average of two analyses. (2) Hotson farm, South Africa; by XRF, H₂O by the Penfield method. (3) Al₁₂(SO₄)₅(OH)₂₆•20H₂O.

Occurrence: In veinlets in a kaolinite-böhmite rock (Punjab Salt Range, Pakistan); an alteration product of natroalunite or directly by hydrothermal sulfatization of sillimanite in massive sillimanite veins (Hotson farm, South Africa).

Association: Kaolinite, böhmite, alunite (Punjab Salt Range, Pakistan); natroalunite, hotsonite (Hotson farm, South Africa).

Distribution: From the Punjab Salt Range, Pakistan. On the Hotson farm, 65 km west of Pofadder, Cape Province, South Africa.

Name: In honor of Mohammed Abdur Zaher (1935–), Geological Survey of Bangladesh, who discovered the mineral.

Type Material: National Museum of Natural History, Washington, D.C., USA, 143793.

References: (1) Ruotsala, A.P. and L.L. Babcock (1977) Zaherite, a new hydrated aluminum sulfate. *Amer. Mineral.*, 62, 1125–1128. (2) Beukes, G.J., A.E. Schoch, H. de Bruijn, W.A. van der Westhuizen, and L.D.C. Bok (1984) A new occurrence of the hydrated aluminium sulphate zaherite, from Pofadder, South Africa. *Mineral. Mag.*, 48, 131–135. (3) de Bruijn, H., A.E. Schoch, G.J. Beukes, L.D.C. Bok, and W.A. van der Westhuizen (1985) Note on cell parameters of zaherite. *Mineral. Mag.*, 49, 145–146. (4) Schoch, A.E., G.J. Beukes, and H.E. Praekelt (1985) A natroalunite-zaherite-hotsonite paragenesis from Pofadder, Bushmanland, South Africa. *Can. Mineral.*, 23, 29–34.

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