

**Basaluminitite****Al<sub>4</sub>(SO<sub>4</sub>)(OH)<sub>10</sub>•4–5H<sub>2</sub>O**

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**Crystal Data:** Monoclinic. *Point Group:* 2/m. Microcrystalline, as crystals with rhombic outlines, to about 2 μm; commonly in compact masses.

**Physical Properties:** *Fracture:* Conchoidal. Hardness = n.d. D(meas.) = 2.08–2.12  
D(calc.) = 2.12

**Optical Properties:** Semitransparent. *Color:* White to pale yellow, pale brown.  
*Optical Class:* [Biaxial.] *Orientation:* Negative elongation.  $n = 1.515\text{--}1.540$ , 1.525 average.  
 $\alpha = \text{n.d.}$   $\beta = \text{n.d.}$   $\gamma = \text{n.d.}$   $2V(\text{meas.}) = \text{n.d.}$

**Cell Data:** *Space Group:* n.d.  $a = 14.857(3)$   $b = 10.011(3)$   $c = 11.086(3)$   
 $\beta = 122.28(3)^\circ$   $Z = 4$

**X-ray Powder Pattern:** Chickerell, England.  
9.36 (100), 4.681 (27), 4.273 (20), 5.91 (13), 1.888 (12), 3.687 (10), 2.720 (10)

<b>Chemistry:</b>	(1)	(2)	(3)
SO <sub>3</sub>	17.15	18.10	17.25
Al <sub>2</sub> O <sub>3</sub>	42.85	44.75	43.94
CaO		0.20	
H <sub>2</sub> O	[40.00]	35.60	38.81
insol.		0.72	
Total	[100.00]	99.37	100.00

(1) Irchester, England; average of two analyses, after deduction of Fe<sub>2</sub>O<sub>3</sub> and allophane, H<sub>2</sub>O by difference, corresponds to Al<sub>3.92</sub>(SO<sub>4</sub>)<sub>1.00</sub>(OH)<sub>9.76</sub>•5.48H<sub>2</sub>O. (2) Chickerell, England; corresponds to Al<sub>3.88</sub>(SO<sub>4</sub>)<sub>1.00</sub>(OH)<sub>9.64</sub>•3.92H<sub>2</sub>O. (3) Al<sub>4</sub>(SO<sub>4</sub>)(OH)<sub>10</sub>•5H<sub>2</sub>O.

**Occurrence:** Typically a weathering product of clays, as the result of acid released from the oxidation of pyrite; probably always a dehydration product of hydrobasaluminitite; as coatings on joint surfaces and veinlets in ironstone (Irchester, England); in chalk (Clifton Hill, England); a reaction rim surrounding carbonate concretions (Chickerell, England); on fractures in garnet–sillimanite laterite (Kanogami, Japan).

**Association:** Hydrobasaluminitite, hydroargillite, meta-aluminite, allophane, gibbsite, gypsum, aragonite.

**Distribution:** In England, from the Lodge pit, Irchester, Northamptonshire; on Clifton Hill, Brighton, Sussex; at the Crook Hill brickyard, Chickerell, near Weymouth, Dorset. From Moel Goedog, near Harlech, Merioneth, Wales. Found north of Ballybunion, Co. Kerry, Ireland. At Épernay, Marne, France. In the Vodino and Chekur-Koyashe sulfur deposits, along the middle Volga, and at the Kaluginsk deposits, Middle Ural Mountains, Russia. In the USA, from Shoals, Martin Co., Indiana; in the Flemming coal bed, Crawford Co., Kansas; at the Fuemrole mine, Temple Mountain, Emery Co., Utah; near Fort Foote, Prince Georges Co., Maryland; in Arizona, in the Lavender pit, Bisbee, Cochise Co. From Kanogami, Fukushima Prefecture, Japan. Several additional localities are known.

**Name:** As a BASic sulfate of ALUMINum.

**Type Material:** The Natural History Museum, London, England, 1950,56–61; Harvard University, Cambridge, Massachusetts, USA, 101819.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 586. (2) Clayton, T. (1980) Hydrobasaluminitite and basaluminitite from Chickerell, Dorset. *Mineral. Mag.*, 43, 931–937.

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