

**Hotsonite****Al<sub>5</sub>(PO<sub>4</sub>)(SO<sub>4</sub>)(OH)<sub>10</sub>•8H<sub>2</sub>O**

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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$  or 1. Crystals are lathlike or acicular, to 15  $\mu\text{m}$ ; as cryptocrystalline chalklike incrustations and veins.

**Physical Properties:** *Fracture:* Earthy. Hardness = 2.5 in aggregates.  $D(\text{meas.}) = 2.060\text{--}2.068$   $D(\text{calc.}) = 2.06$

**Optical Properties:** Translucent. *Color:* White; colorless in transmitted light. *Luster:* Silky to dull, earthy.

*Optical Class:* Biaxial. *Orientation:* Length-fast.  $\alpha = 1.519$   $\beta = \text{n.d.}$   $\gamma = 1.521$

$2V(\text{meas.}) = \text{n.d.}$

**Cell Data:** *Space Group:*  $P\bar{1}$  or  $P1$ .  $a = 11.288(59)$   $b = 11.658(60)$   $c = 10.550(67)$   
 $\alpha = 112^\circ 32(3)'$   $\beta = 107^\circ 31(3)'$   $\gamma = 64^\circ 27(3)'$   $Z = 1$

**X-ray Powder Pattern:** Koenabib, South Africa.

10.05 (100), 8.45 (40), 4.63 (20), 5.20 (10), 5.01 (10), 4.43 (10), 3.67 (10)

<b>Chemistry:</b>	(1)	(2)	(3)		(1)	(2)	(3)
SO <sub>3</sub>	16.80	13.73	12.51	CaO	0.24	0.89	
P <sub>2</sub> O <sub>5</sub>	9.85	9.06	11.09	Na <sub>2</sub> O	0.21		
SiO <sub>2</sub>	0.35	0.16		K <sub>2</sub> O	0.0		
TiO <sub>2</sub>		0.01		H <sub>2</sub> O <sup>+</sup>		31.29	
Al <sub>2</sub> O <sub>3</sub>	39.15	39.60	39.82	H <sub>2</sub> O <sup>-</sup>		4.28	
Fe <sub>2</sub> O <sub>3</sub>	0.03	0.18		H <sub>2</sub> O	33.30		36.58
MgO	0.28	0.41		insol.		0.33	
				<b>Total</b>	<b>100.21</b>	<b>99.94</b>	<b>100.00</b>

(1) Koenabib, South Africa; by X-ray fluorescence, average of four analyses, H<sub>2</sub>O by a modified Penfield method, P<sub>2</sub>O<sub>5</sub> and SO<sub>3</sub> by wet chemical methods. (2) Blyavinski mine, Russia.

(3) Al<sub>5</sub>(PO<sub>4</sub>)(SO<sub>4</sub>)(OH)<sub>10</sub>•8H<sub>2</sub>O.

**Occurrence:** A weathering product derived from natroalunite and zaherite in an arid climate (Koenabib, South Africa).

**Association:** Zaherite, natroalunite, sillimanite (Koenabib, South Africa).

**Distribution:** Found in the Hotson 6 quarry, Koenabib, 65 km west of Pofadder, Cape Province, South Africa. From the Blyavinski mine, Ural Mountains, Russia.

**Name:** For Hotson 42, the farm in South Africa on which the first specimens were collected.

**Type Material:** National Museum, Bloemfontein, South Africa, K2359; National Museum of Natural History, Washington, D.C., USA, 162230.

**References:** (1) Beukes, G.J., A.E. Schoch, W.A. Van der Westhuizen, L.D.C. Bok, and H. de Bruijn (1984) Hotsonite, a new hydrated aluminum-phosphate-sulfate from Pofadder, South Africa. *Amer. Mineral.*, 69, 979–983. (2) de Bruijn, H., G.J. Beukes, W.A. Van der Westhuizen, and E.A.W. Tordiffe (1989) Unit cell dimensions of the hydrated aluminum phosphate-sulphate minerals sanjuanite, kribergite, and hotsonite. *Mineral. Mag.*, 53, 385–386. (3) Ivanov, O.K., L.L. Shiryaeva, L.A. Khoroshilova, and V.G. Petrisheva (1990) Hotsonite – confirmation of discovery and new data (Blyavinski mine, Urals). *Zap. Vses. Mineral. Obsch.*, 119(1), 121–126 (in Russian).