

Sasaite**(Al, Fe³⁺)₆(PO₄, SO₄)₅(OH)₃•35–36H₂O**

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Crystal Data: Orthorhombic (?). *Point Group:* n.d. Crystals with rhombic outline, {110}, small {100}, {010}, to 20 μm, stacked in twisted vermiciform aggregates; in veinlets, nodules, and efflorescences.

Physical Properties: *Cleavage:* On {001}, perfect. *Tenacity:* Chalky. Hardness = Soft. D(meas.) = 1.75 D(calc.) = 1.78 H₂O content variable with humidity.

Optical Properties: Transparent. *Color:* White; colorless in transmitted light. *Optical Class:* Biaxial (-). *Orientation:* X ≈ c; Y ≈ b; Z ≈ a. α = 1.465(1) β = 1.473(1) γ = 1.477(1) 2V(meas.) = n.d.

Cell Data: *Space Group:* n.d. a = 10.75 b = 15.02 c = 46.03 Z = 6

X-ray Powder Pattern: West Driefontein Cave, South Africa; fully hydrated. 11.52 (100), 2.901 (42), 6.99 (23), 7.51 (22), 6.30 (21), 4.214 (18), 3.262 (18)

Chemistry:	(1)	(2)		(1)	(2)
SO ₃	2.77	3.72	CaO	0.12	0.08
P ₂ O ₅	24.16	32.79	SrO	0.02	
Al ₂ O ₃	21.65	29.81	K ₂ O		0.11
Fe ₂ O ₃	1.05	0.13	F	0.03	
MnO	0.01		H ₂ O	49.50	[32.98]
MgO	0.07		-O = F ₂	0.01	
CuO		0.38	insol.	0.07	
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			Total	99.44	[100.00]

(1) West Driefontein Cave, South Africa; corresponds to (Al_{5.77}Fe_{0.18}Ca_{0.03}Mg_{0.02})_{Σ=6.00} [(PO₄)_{4.62}(SO₄)_{0.47}]_{Σ=5.09}(OH)_{3.13}•35.79H₂O. (2) Cheshunt, Australia; by electron microprobe, total Fe as Fe₂O₃, H₂O by difference, (OH)¹⁻ for charge balance; corresponds to (Al_{5.97}Fe_{0.02}Ca_{0.01})_{Σ=6.00} [(PO₄)_{4.72}(SO₄)_{0.47}]_{Σ=5.19}(OH)_{2.89}•17.33H₂O.

Occurrence: Rarely formed from acidic phosphate-sulfate-rich solutions derived from bat guano reacting with clay minerals in cave soil (West Driefontein Cave, South Africa; Skipton lava tube caves, Australia); in veinlets in slate (Cheshunt, Australia).

Association: Variscite, strengite, phosphosiderite, leucophosphite, apatite.

Distribution: In West Driefontein Cave, Carlstonville, west Transvaal, South Africa. In Australia, in the Skipton lava tube caves, 40 km southwest of Ballarat, and near Cheshunt, Victoria. At Rapid Creek, Yukon Territory, Canada. In the Feengrotten (Cave), near Saalfeld, Thuringia, Germany.

Name: For the South African Speleological Association (SASA), whose members collected the first specimens.

Type Material: Geological Survey, Pretoria, South Africa; National Museum of Natural History, Washington, D.C., USA, 146835.

References: (1) Martini, J. (1978) Sasaite, a new phosphate mineral from West Driefontein Cave, Transvaal, South Africa. *Mineral. Mag.*, 42, 401–404. (2) (1979) *Amer. Mineral.*, 64, 464–465 (abs. ref. 1). (3) Johan, Z., E. Slansky, and P. Povondra (1983) Vashegyite, a sheet aluminum phosphate: new data. *Can. Mineral.*, 21, 489–498, esp. 497. (4) Birch, W.D. and D.A. Henry (1993) Phosphate minerals of Victoria, 87–88, 130–131.