

Sigloite

$\text{Fe}^{3+}\text{Al}_2(\text{PO}_4)_2(\text{OH})_3 \cdot 7\text{H}_2\text{O}$

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals are pseudomorphic after paravauxite crystals, distorted and curved, showing {010}, {001}, {100}, {110}, several other forms, to about 1 cm, in intergrowths.

Physical Properties: *Cleavage:* On {010}, perfect; on {001}, good. Hardness = 3
D(meas.) = 2.35 D(calc.) = [2.40]

Optical Properties: Semitransparent. *Color:* Pale straw-yellow, pale brownish orange, light brown.

Optical Class: Biaxial (+). *Orientation:* X (90°, 32°); Y (-144°, 70°); Z (-46°, 66°) [using (ϕ, ρ)].
Dispersion: $r < v$, strong. $\alpha = 1.563$ $\beta = 1.586(1)$ $\gamma = 1.619$ $2V(\text{meas.}) = 76^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 5.190(2)$ $b = 10.419(4)$ $c = 7.033(3)$ $\alpha = 105.00(3)^\circ$
 $\beta = 111.31(3)^\circ$ $\gamma = 70.87(3)^\circ$ $Z = 1$

X-ray Powder Pattern: Siglo XX mine, Bolivia.
9.69 (10), 6.46 (9), 4.86 (9), 3.23 (7), 2.82 (6), 2.56 (5), 4.68 (4b)

Chemistry:

	(1)	(2)
P ₂ O ₅	27.47	29.77
SiO ₂	0.11	
Al ₂ O ₃	21.09	21.38
Fe ₂ O ₃	13.53	16.74
FeO	2.76	
MnO	0.24	
MgO	0.87	
Na ₂ O	0.44	
K ₂ O	0.26	
H ₂ O	33.55	32.11
Total	100.32	100.00

(1) Siglo XX mine, Bolivia. (2) $\text{FeAl}_2(\text{PO}_4)_2(\text{OH})_3 \cdot 7\text{H}_2\text{O}$.

Mineral Group: Paravauxite group.

Occurrence: A rare late-stage secondary mineral, formed by oxidation of vauxite, in open fractures cutting cassiterite veins in a hydrothermal tin deposit.

Association: Wavellite, metavauxite, crandallite, childrenite, vauxite, quartz.

Distribution: Found in the Siglo XX mine, Llallagua, Potosí, Bolivia.

Name: For its occurrence in the Siglo XX mine, Llallagua, Bolivia.

Type Material: Harvard University, Cambridge, Massachusetts, 107443; National Museum of Natural History, Washington, D.C., USA, 115320.

References: (1) Hurlbut, C.S., Jr. and R. Honea (1962) Sigloite, a new mineral from Llallagua, Bolivia. *Amer. Mineral.*, 47, 1–8. (2) Hawthorne, F.C. (1988) Sigloite: the oxidation mechanism in $[\text{M}_2^{3+}(\text{PO}_4)_2(\text{OH})_2(\text{H}_2\text{O})_2]^{2-}$ structures. *Mineral. Petrol.*, 38, 201–211.