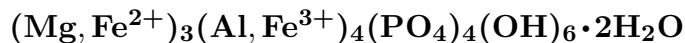


Souzalite

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$ or 1. Crystals are bladed, to 1 cm, in aggregates; as coarse fibrous masses. *Twinning:* Commonly exhibits polysynthetic twinning, with twin axis [010] and composition plane {001}.

Physical Properties: *Cleavage:* On {001}, good; a second \perp {001}, poor. Hardness = 5.5–6 D(meas.) = 3.087 D(calc.) = 3.07

Optical Properties: Semitransparent. *Color:* Green, blue-green, emerald-green. *Streak:* Pale green. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Pleochroism:* Strong; X = green to colorless; Y = blue; Z = colorless to yellow. *Orientation:* X \perp a cleavage; Z = elongation. *Dispersion:* $r > v$, extreme. $\alpha = 1.617\text{--}1.618$ $\beta = 1.642$ $\gamma = 1.652\text{--}1.653$ 2V(meas.) = n.d. 2V(calc.) = 66°–68°

Cell Data: *Space Group:* $P\bar{1}$ or P1. $a = 11.74(1)$ $b = 5.11(1)$ $c = 13.58(1)$
 $\alpha = 90^\circ 55(5)'$ $\beta = 99^\circ 05(5)'$ $\gamma = 90^\circ 20(5)'$ Z = 2

X-ray Powder Pattern: Corrego Frio mine, Brazil.

3.386 (100), 2.553 (90d), 2.921 (80d), 4.760 (60), 3.152 (60), 3.06 (40), 6.72 (30)

Chemistry:

	(1)
P ₂ O ₅	37.70
TiO ₂	0.07
Al ₂ O ₃	26.07
Fe ₂ O ₃	2.65
FeO	11.49
MnO	0.31
SnO	0.04
MgO	9.62
CaO	0.02
H ₂ O ⁺	12.04
Total	100.01

(1) Corrego Frio mine, Brazil; corresponding to $(\text{Mg}_{1.78}\text{Fe}_{1.19}^{2+}\text{Mn}_{0.03})_{\Sigma=3.00}(\text{Al}_{3.82}\text{Fe}_{0.25}^{3+})_{\Sigma=4.07}(\text{PO}_4)_{3.96}(\text{OH})_{6.33} \cdot 1.82\text{H}_2\text{O}$.

Polymorphism & Series: Forms a series with gormanite.

Occurrence: A rare hydrothermal alteration product of scorzalite in complex zoned granite pegmatites, in sedimentary phosphate nodules, and in a high-pressure kyanite deposit.

Association: Scorzalite.

Distribution: From the Corrego Frio pegmatite mine, Divino das Laranjeiras, near Linópolis, Minas Gerais, Brazil. Along Rapid Creek, Yukon Territory, Canada. In the Bell Pit, Newry, Oxford Co., Maine, USA.

Name: To honor Dr. Antonio José Alves de Souza (1896–1961), Director, Mineral Survey of Brazil, Rio de Janeiro, Brazil.

Type Material: Royal Ontario Museum, Toronto, Canada, M34010; Harvard University, Cambridge, Massachusetts, 100680; National Museum of Natural History, Washington, D.C., USA, C5863, 159981, 160114.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 911–912. (2) Moore, P.B. (1970) Crystal chemistry of the basic iron phosphates. *Amer. Mineral.*, 55, 135–169. (3) Sturman, B.D., J.A. Mandarino, M.E. Mrose, and P.J. Dunn (1981) Gormanite, $\text{Fe}_3^+\text{Al}_4(\text{PO}_4)_4(\text{OH})_6 \cdot 2\text{H}_2\text{O}$, the ferrous analogue of souzalite, and new data for souzalite. *Can. Mineral.*, 19, 381–387.

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