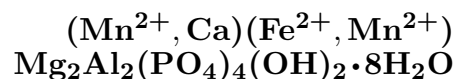


**Whiteite-(MnFeMg)**

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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . Crystals are warped, canoe-shaped, showing only  $\{\bar{1}11\}$ ,  $\{001\}$ , to 1.5 cm. *Twinning:* By reflection on  $\{001\}$ , common, giving a pseudo-orthorhombic outline.

**Physical Properties:** *Cleavage:* On  $\{001\}$ , good to perfect. Hardness = 3–4  
D(meas.) = 2.67(2) D(calc.) = 2.62

**Optical Properties:** Semitransparent. *Color:* Chocolate-brown; colorless in thin fragments.  
*Optical Class:* Biaxial (+). *Orientation:*  $X \perp \{001\}$ .  $\alpha = 1.575(5)$   $\beta = 1.585(5)$   $\gamma = 1.595(5)$   
 $2V(\text{meas.}) = 80^\circ\text{--}90^\circ$

**Cell Data:** *Space Group:*  $P2_1/a$ .  $a = 14.99(2)$   $b = 6.96(1)$   $c = 10.14(1)$   $\beta = 113^\circ 19(6)'$   
 $Z = 2$

**X-ray Powder Pattern:** Lavra da Ilha pegmatite; close to whiteite-(CaFeMg).  
9.318 (100), 2.776 (90), 4.824 (50), 2.948 (45), 4.644 (40), 3.518 (35), 3.245 (35)

<b>Chemistry:</b>	(1)
	P <sub>2</sub> O <sub>5</sub> 36.4
	Al <sub>2</sub> O <sub>3</sub> 12.7
	FeO 7.9
	MnO 7.6
	MgO 10.1
	CaO 1.4
	H <sub>2</sub> O n.d.
	<hr/> Total

(1) Lavra da Ilha pegmatite, Brazil; by electron probe, partial analysis, total Fe as FeO, total Mn as MnO; corresponding approximately to  $(\text{Mn}_{0.9}^{2+}\text{Ca}_{0.2})_{\Sigma=1.1}(\text{Fe}_{0.9}^{2+}\text{Mn}_{0.1}^{2+})_{\Sigma=1.0}\text{Mg}_{2.0}\text{Al}_{2.0}(\text{PO}_4)_4(\text{OH})_2 \cdot 8\text{H}_2\text{O}$ .

**Mineral Group:** Whiteite group; Al > Fe<sup>3+</sup> in the M(3) structural site.

**Occurrence:** In complex zoned granite pegmatites.

**Association:** Eosphorite, zanazziite, wardite, albite, quartz (Lavra da Ilha pegmatite, Brazil).

**Distribution:** From the Lavra da Ilha pegmatite, in the Jequitinhonha River, three km north of Taquaral, and at the Énio pegmatite mine, northeast of Galiléia, Minas Gerais, Brazil.

**Name:** For its relation to *whiteite*-(CaFeMg); the suffix indicates sequentially the dominant atom in the X, M(1), and M(2) structural positions.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 161211.

**References:** (1) Moore, P.B. and J. Ito (1978) I. Whiteite, a new species, and a proposed nomenclature for the jahnsite-whiteite complex series. II. New data on xanthoxenite. III. Salmonsite discredited. *Mineral. Mag.*, 42, 309–323. (2) (1979) *Amer. Mineral.*, 64, 465–466 (abs. ref. 1).