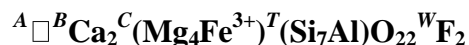


Magnesio-ferri-fluoro-hornblende

Crystal Data: Monoclinic. *Point Group:* 2/m. As prismatic crystals to 3 mm, striated parallel to elongation.

Physical Properties: *Cleavage:* Perfect on {110}. *Fracture:* n.d. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.315

Optical Properties: Transparent. *Color:* Dark brown. *Streak:* n.d. *Luster:* Vitreous. *Optical Class:* Biaxial (-). $\alpha = 1.669(2)$ $\beta = 1.676(2)$ $\gamma = 1.678(2)$ $2V(\text{meas.}) = 74(1)^\circ$ $2V(\text{calc.}) = 56^\circ$ *Orientation:* $X \wedge a = 47.6^\circ$ (β obtuse), $Y \parallel b$, $Z \wedge c = 33.4$ (β acute). *Pleochroism:* $Y = \text{dark gray}$; $Z = \text{pale brownish gray}$; $X = \text{pale gray}$. *Absorption:* $Y > Z > X$.

Cell Data: *Space Group:* C2/m. $a = 9.839(5)$ $b = 18.078(9)$ $c = 5.319(3)$ $\beta = 104.99(3)^\circ$ $Z = 2$

X-ray Powder Pattern: Near Portoscuso, Cagliari, Sardinia, Italy.

2.711 (100), 8.412 (89), 3.121 (64), 2.553 (61), 3.389 (55), 2.599 (45), 2.164 (36)

Chemistry:	(1)	(2)
SiO ₂	45.34	49.67
Al ₂ O ₃	6.18	6.02
TiO ₂	1.22	
FeO _{total}	20.88	
FeO	[15.24]	
Fe ₂ O ₃	[6.27]	9.43
MgO	9.71	19.04
MnO	0.78	
ZnO	0.06	
CaO	10.18	13.24
Na ₂ O	1.35	
K ₂ O	1.15	
F	3.22	4.49
Cl	0.30	
-O = (F,Cl) ₂	1.42	1.89
H ₂ O	[0.37]	
Total	99.95	100.00

(1) Near Portoscuso, Cagliari, Sardinia, Italy; average of 10 electron microprobe analyses, H₂O calculated, FeO/Fe₂O₃ calculated from structure; corresponds to (Na_{0.15}K_{0.22}) $\Sigma=0.37$ (Na_{0.25}Ca_{1.66}Mn_{0.09}) $\Sigma=2.00$ (Mg_{2.20}Fe²⁺_{1.94}Mn_{0.01}Zn_{0.01}Fe³⁺_{0.72}Ti_{0.13}) $\Sigma=5.01$ (Al_{1.11}Si_{6.89}) $\Sigma=8.00$ O₂₂[F_{1.55}(OH)_{0.37}Cl_{0.08}] $\Sigma=2.00$.
 (2) Ca₂(Mg₄Fe³⁺)(Si₇Al)O₂₂F₂.

Mineral Group: Amphibole supergroup.

Occurrence: In vugs in a welded tuff.

Association: Tridymite, todorokite, magnetite, hematite.

Distribution: Along the coast road, ~5.5 km northeast of Portoscuso, Cagliari, Sardinia, Italy.

Name: For a calcium amphibole with dominant magnesium and ferric iron in the C site and fluorine dominant in the W site.

Type Material: Mineralogical Museum, Department of Earth and Environmental Sciences, University of Pavia, Italy (2014-01).

References: (1) Oberti, R., M. Boiocchi, F.C. Hawthorne, N.A. Ball, and L. Chiappino (2016) Magnesio-ferri-fluoro-hornblende from Portoscuso, Sardinia, Italy: description of a newly approved member of the amphibole supergroup. *Mineral. Mag.*, 80(2), 269-275. (2) (2016) *Amer. Mineral.*, 101, 2781 (abs. ref. 1).