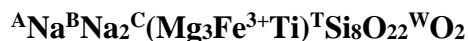


**Ferri-obertiite**

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As acicular to lamellar crystals to 300  $\mu\text{m}$ .

**Physical Properties:** *Cleavage:* Perfect on {110}. *Tenacity:* Brittle. *Fracture:* n.d.  
Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.145

**Optical Properties:** Transparent. *Color:* Pink-orange. *Streak:* n.d. *Luster:* Vitreous.  
*Optical Class:* Biaxial (+).  $\alpha = 1.664(2)$   $\beta = 1.680(2)$   $\gamma = 1.722(2)$   $2V(\text{meas.}) = 66.4(3)^\circ$   
 $2V(\text{calc.}) = 64.7^\circ$  *Pleochroism:* X = pale pink, Y = pinkish orange, Z = orange-brown.  
*Absorption:*  $X < Y < Z$ . *Orientation:*  $X \parallel b$ ,  $Y \wedge c = 17.8^\circ$  (in  $\beta$  obtuse),  $Z \wedge a = 3.5^\circ$  (in  $\beta$  acute).

**Cell Data:** *Space Group:* C2/m.  $a = 9.7901(7)$   $b = 17.9354(13)$   $c = 5.2892(4)$   $\beta = 104.142(2)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Rothenberg Volcano, Eifel complex, Rhineland-Palatinate, Germany.  
2.704 (100), 3.116, (76), 3.388 (72), 8.931, (72), 2.5299 (67), 2.583 (39), 2.160 (38)

Chemistry:	(1)	(2)
SiO <sub>2</sub>	55.32	56.27
TiO <sub>2</sub>	7.31	9.35
Al <sub>2</sub> O <sub>3</sub>	0.34	
Cr <sub>2</sub> O <sub>3</sub>	0.12	
Fe <sub>2</sub> O <sub>3</sub>	5.81	9.35
MnO	1.32	
MgO	17.00	14.15
ZnO	0.05	
NiO	0.04	
CaO	2.31	
Na <sub>2</sub> O	8.62	10.88
K <sub>2</sub> O	1.24	
H <sub>2</sub> O	[0.20]	
F	1.22	
Cl	0.01	
- O = F <sub>2</sub>	0.52	
Total	100.43	100.00

(1) Rothenberg Volcano, Eifel complex, Rhineland-Palatinate, Germany; average of 10 electron microprobe analyses, H<sub>2</sub>O calculated to minimize non-negative values of Fe<sup>2+</sup> and (F+OH+Cl+O) = 2 apfu; corresponds to  ${}^A(\text{Na}_{0.76}\text{K}_{0.22})_{\Sigma=0.98}{}^B(\text{Na}_{1.61}\text{Ca}_{0.35}\text{Mn}^{2+}_{0.04})_{\Sigma=2.00}{}^C(\text{Mg}_{3.58}\text{Mn}^{2+}_{0.11}\text{Fe}^{3+}_{0.62}\text{Ti}^{4+}_{0.66}\text{Cr}^{3+}_{0.01}\text{Zn}_{0.01}\text{Ni}_{0.01})_{\Sigma=5.00}{}^T(\text{Si}_{7.82}\text{Ti}^{4+}_{0.12}\text{Al}_{0.06})_{\Sigma=8.00}\text{O}_{22}{}^W[\text{O}_{1.26}\text{F}_{0.55}(\text{OH})_{0.19}]_{\Sigma=2.00}$ .  
(2)  ${}^A\text{Na}{}^B\text{Na}_2{}^C(\text{Mg}_3\text{Fe}^{3+}\text{Ti})^T\text{Si}_8\text{O}_{22}{}^W\text{O}_2$ .

**Occurrence:** From vesicles in silicate veins within basaltic scoria.

**Mineral Group:** Amphibole supergroup, oxo-amphibole group.

**Association:** Sanidine,  $\alpha$ -quartz paramorphic after  $\beta$ -quartz, eifelite, tridymite, rutile, roedderite.

**Distribution:** From the Rothenberg Volcano, Eifel complex, Rhineland-Palatinate, Germany.

**Name:** For an oxo-amphibole with Fe<sup>3+</sup> dominant over Fe<sup>2+</sup> in the C site.

**Type Material:** Museo di Mineralogia, Dipartimento di Scienze della Terra e dell'Ambiente, Università degli Studi, Pavia, Italy (2015-02).

**References:** (1) Oberti, R., M. Boiocchi, F.C. Hawthorne, N.A. Ball, and G. Blass (2017) Ferri-obertiite from the Rothenberg quarry, Eifel volcanic complex, Germany: Mineral data and crystal chemistry of a new amphibole end-member. *Mineral. Mag.*, 81(3), 641-651. (2) (2018) *Amer. Mineral.*, 103, 332 (abs. ref. 1).