Oxyphlogopite $K(Mg, Ti, Fe)_3[(Si, Al)_4O_{10}](O, F)_2$

Crystal Data: Monoclinic or Hexagonal. *Point Group*: 2/*m* or 32. Crystals prismatic, to 1.5 mm, or tabular, to 4 mm.

Physical Properties: *Cleavage:* Perfect on {001}. *Tenacity:* Thin lamellae are flexible. *Fracture:* n.d. Hardness = 3 D(meas.) = 3.06(1) D(calc.) = 3.086

Optical Properties: Translucent. *Color:* Dark brown to black. *Streak:* Brown. *Luster:* Vitreous. *Optical Class:* Biaxial (-). α = 1.625(3) β = 1.668(1) γ = 1.669(1) 2V(meas.) = 16(2)° 2V(calc.) = 17° *Orientation*: $X \perp$ (001). *Dispersion*: Strong, $r < v$. *Pleochroism*: Medium, brown to dark brown. *Absorption: X > Y > Z.*

Cell Data: *Space Group*: *C*2/*m* (1*M* polytype). a = 5.317(12) b = 9.161(2) c = 10.069(2) β = 100.53(6)° Z = 2 or $P3_112$ (3*T* polytype). a = 5.3248(2) c = 29.788(3) Z = 3

X-ray Powder Pattern: Rothenberg basalt quarry, Rhineland-Palatinate, Germany (1*M*). 3.300 (100), 9.91 (32), 1.895 (21), 1.527 (16), 1.659 (12), 3.090 (12), 4.53 (11)

Chemistry:

	(1)		(1)
Na_2O	0.99	Cr_2O_3	0.60
K_2O	7.52	SiO_2	34.41
MgO	14.65	TiO_2	12.93
CaO	0.27	F	3.06
FeO	4.73	H_2O	0.14
Fe_2O_3	7.25	$-O = F_2$	1.29
Al_2O_3	14.32	Total	99.58

(1) Rothenberg basalt quarry, near Mendig, Rhineland-Palatinate, Germany (1*M*); average of 5 electron microprobe analyses, absence of OH^- groups confirmed by IR spectroscopy, H_2O determined by the Alimarin method, Fe^{2+}/Fe^{3+} ratio by X-ray emission spectroscopy; corresponds to $(K_{0.72}Na_{0.14}Ca_{0.02})_{\Sigma=0.88}(Mg_{1.64}Ti_{0.73}Fe^{2+}_{0.30}Fe^{3+}_{0.27}Cr_{0.04})_{\Sigma=2.98}(Si_{2.59}Al_{1.27}Fe^{3+}_{0.14}O_{10})O_{1.20}F_{0.73}(OH)_{0.07}$. (2) Bartoy volcanic field, Transbaikalia, Russia (3*T*); analysis not seen; corresponds to $^{A}(K_{0.9}Na_{0.1})[^{M1}(Fe^{2+}_{0.6}Mg_{0.4})^{M2}(Fe^{3+}_{0.4}Ti_{0.4}Mg_{0.2})^{M3}(Mg_{0.4}Fe^{3+}_{0.3}Ti_{0.2}Al_{0.1})][^{T1,2}(Si_{0.7}Al_{0.3})_2O_5]_2{}^{X}(O_{0.9}F_{0.1})_2$.

Polymrphism & Series: 1*M* and 3*T* polytypes.

Mineral Group: Mica group.

Occurrence: Pneumatolytic crystals coat vugs in alkaline basalt.

Association: Nepheline, plagioclase, sanidine, augite, diopside, magnetite.

Distribution: From Rothenberg basalt quarry, Eifel extrusive complex, Rothenberg Mountain, near Mendig, Rhineland-Palatinate, Germany [TL 1*M*]. From the Bartoy volcanic field, Transbaikalia, Russia (3*T*).

Name: For its composition (*oxy*) and relationship to *phlogopite*.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia; 3884/2 (holotype), 3884/1 (cotype).

References: (1) Chukanov, N.V., A.A. Mukhanova, R.K. Rastsvetaeva, D.I. Belakovskiy, S. Möckel, O.V. Karimova, S.N. Britvin, and S.V. Krivovichev (2010) Oxyphlogopite $K(Mg,Ti,Fe)_3[(Si,Al)_4O_{10}](O,F)_2$, a new mica group mineral. Zap. Ross. Mineral. Obshch., 139(3), 31-40 (in Russian, English abstract). Geol. Ore Deposits (2011) 53(7), 583 (in English). (2) (2012) Amer. Mineral., 97, 1819-1820 (abs. ref. 1). (3) Chukanov, N.V., S.M. Aksenov, A.V. Kasatkin, R. Škoda, F. Nestola, L. Nodari, A.D. Ryanskaya, and R.K. Rastsvetaeva (2019) 3*T* polytype of an iron-rich oxyphlogopite from the Bartoy volcanic field, Transbaikalia: Mössbauer, infrared, Raman spectroscopy, and crystal structure. Phys. Chem. Mineral., 46, 899-908.