

Phlogopite

KMg₃Si₃AlO₁₀(F, OH)₂

©2001 Mineral Data Publishing, version 1.2

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals six-sided, thick tabular to prismatic, commonly tapered, to 10 m and 270 t. Also coarse-grained, platy, and as small scales. *Twinning:* Composition plane {001}, twin axis [310].

Physical Properties: *Cleavage:* {001}, perfect. *Tenacity:* Thin laminae flexible and elastic, tough. Hardness = 2–3 D(meas.) = 2.78–2.85 D(calc.) = 2.79

Optical Properties: Transparent to translucent. *Color:* Brownish red, dark brown, yellowish brown, green, white; colorless, pale yellow, or green in thin section. *Streak:* White. *Luster:* Pearly to submetallic on cleavage.

Optical Class: Biaxial (-). *Pleochroism:* $X = \text{yellow}$; $Y = Z = \text{brownish red, green, yellow}$. *Orientation:* $Y = b$; $Z \wedge a = 0^\circ\text{--}5^\circ$. *Dispersion:* $r < v$. *Absorption:* $Z > Y \gg X$. $\alpha = 1.530\text{--}1.590$ $\beta = 1.557\text{--}1.637$ $\gamma = 1.558\text{--}1.637$ $2V(\text{meas.}) = 0^\circ\text{--}15^\circ$

Cell Data: *Space Group:* $C2/m$ (1M). $a = 5.3078(4)$ $b = 9.1901(5)$ $c = 10.1547(8)$
 $\beta = 100.08(1)^\circ$ $Z = 2$

X-ray Powder Pattern: South Burgess Township (?), Ontario, Canada (1M).
9.94 (100), 3.348 (100), 2.614 (30), 2.011 (30), 3.390 (20), 2.513 (16), 2.429 (16)

Chemistry:	(1)		(1)		(1)
SiO ₂	42.0	ZnO	0.01	K ₂ O	8.46
TiO ₂	0.22	MgO	28.6	Rb ₂ O	0.01
Al ₂ O ₃	12.7	CaO	0.04	F	5.85
FeO	0.25	BaO	1.70	H ₂ O ⁺	1.51
MnO	0.08	Li ₂ O	0.01	<u>-O = F₂</u>	[2.46]
NiO	0.02	Na ₂ O	1.19	Total	[100.19]

(1) Franklin, New Jersey, USA; corresponds to $(\text{K}_{0.76}\text{Na}_{0.16}\text{Ba}_{0.05})_{\Sigma=0.97}(\text{Mg}_{2.98}\text{Fe}_{0.01}^{2+})_{\Sigma=2.99}\text{Si}_{2.95}\text{Al}_{1.05}\text{O}_{10}[\text{F}_{1.30}(\text{OH})_{0.70}]_{\Sigma=2.00}$.

Polymorphism & Series: 1M, 2M₁, 3A polytypes; forms a series with biotite.

Mineral Group: Mica group.

Occurrence: In metamorphosed dolostones and magnesium-rich limestones; in ultramafic rocks as kimberlites, peridotites, lamproites, and serpentinites.

Association: Dolomite, calcite, diopside, tremolite, scapolite, vesuvianite, apatite, titanite, epidote, olivine, augite, magnetite.

Distribution: Some localities for well-crystallized material include: in the USA, from Antwerp and Natural Bridge, Jefferson Co., and Edwards and Pierrepont, St. Lawrence Co., New York; from Franklin, Sussex Co., New Jersey. In Canada, large crystals from the Lacey mine, Frontenac Co., and in North and South Burgess Townships, Ontario; from near Perkin's Mills, and elsewhere in Gatineau Co., Quebec. In the Slyudyanka region, near Lake Baikal, Siberia, Russia. At Ødegården, near Feset, Norway. From Campolungo, near St. Gotthard, Ticino, Switzerland. In the Val di Fassa, Trentino-Alto Adige, and on Monte Braccio, Val Malenco, Lombardy, Italy. From Saharakara and Ampandrandava, Madagascar. At Anxiety Point, Nancy Sound, New Zealand.

Name: From the Greek for *firelike*, referring to an oft-seen reddish tint.

Type Material: Mining Academy, Freiberg, Germany, 24966.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 632–634. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 3, sheet silicates, 42–54. (3) Smith, J.V. and H.S. Yoder, Jr. (1956) Experimental and theoretical studies of the mica polymorphs. *Mineral. Mag.*, 31, 209–235. (4) Hazen, R.M. and C.W. Burnham (1973) The crystal structures of one-layer phlogopite and annite. *Amer. Mineral.*, 58, 889–900. (5) Rayner, J.H. (1974) The crystal structure of phlogopite by neutron diffraction. *Mineral. Mag.*, 39, 850–856.