

Crystal Data: Monoclinic. *Point Group:* 2/m. As subhedral to euhedral platy crystals to a few hundred microns.

Physical Properties: *Cleavage:* Perfect on {001}. *Tenacity:* Brittle. *Fracture:* n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.235 Nonfluorescent.

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Pearly. *Optical Class:* n.d.

Cell Data: *Space Group:* C2/m. *a* = 5.3161(11) *b* = 9.2082(15) *c* = 10.044(2) β = 100.158(18)° *Z* = 2

X-Ray Diffraction Pattern: Bayan Obo, Inner Mongolia, China. 3.37 (100), 3.12 (90), 2.89 (83), 3.64 (79), 2.16 (60), 2.62 (48), 1.656 (48)

Chemistry:	(1)		(1)
SiO ₂	34.90	FeO	[2.14]
TiO ₂	0.18	MnO	0.03
Al ₂ O ₃	12.47	MgO	23.64
BaO	18.10	F	6.96
Na ₂ O	1.62	H ₂ O	[0.53]
K ₂ O	0.61	<u>-O = F</u>	<u>2.93</u>
Fe ₂ O ₃	[1.95]	Total	100.20

(1) Bayan Obo, Inner Mongolia, China; average electron microprobe analysis, Fe₂O₃ calculated for (Si+Al+Fe³⁺) = 4; remaining Fe taken to be Fe²⁺, H₂O calculated from stoichiometry; corresponds to (Ba_{0.56}Na_{0.25}K_{0.06})(Mg_{2.76}Fe²⁺_{0.14}Ti_{0.01})(Si_{2.73}Al_{1.15}Fe³⁺_{0.12})O₁₀[F_{1.72}(OH)_{0.28}].

Mineral Group: Brittle mica group.

Occurrence: In metamorphosed carbonate rocks associated with a large REE-Fe-Nb deposit.

Association: Phlogopite, yangzhumingite, bastnasite-(Ce), cordylite-(Ce), monazite-(Ce), fluorbritholite-(Ce), huanghoite-(Ce), dolomite, quartz, fluorite, parisite-(Ce), barite, fluorapatite, richterite-arfvedsonite.

Distribution: In the South ore body, East Mine, Bayan Obo, Inner Mongolia, China.

Name: The suffix, *fluoro*, identifies the essential F in a phase related to *kinoshitalite*.

Type Material: National Museum of Nature and Science, Tokyo, Japan (NSM-MFI5354) and the Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China (KDX014).

References: (1) Miyawaki, R., H. Shimazaki, M. Shigeoka, K. Yokoyama, S. Matsubara, H. Yurimoto, Z. Yang, and P. Zhang (2011) Fluorokinoshitalite and fluorotetraferriphlogopite: new species of fluoro-mica from Bayan Obo, Inner Mongolia, China. *Clay Science* 15, 13-18.