

Lileyite**Ba₂(Na,Fe,Ca)₃MgTi₂(Si₂O₇)₂O₂F₂**

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals elongated platy, to 0.3 mm. Dominant form {100}.

Physical Properties: *Cleavage:* Perfect on {001}. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = 3-4 D(meas.) = n.d. D(calc.) = 3.776

Optical Properties: Transparent. *Color:* Brown. *Streak:* White. *Luster:* n.d. *Optical Class:* Biaxial (+). $\alpha = 1.718(5)$ $\beta = 1.735(5)$ $\gamma = 1.755(5)$ $2V$ (meas.) = 75(15)° $2V$ (calc.) = 86° *Dispersion:* $r > v$, medium. *Orientation:* $X = a$; $Y =$ elongation. *Pleochroism:* Medium, $Z =$ greyish-brown; $Y =$ light brown; $X =$ colorless. *Absorption:* $Z > Y > X$.

Cell Data: *Space Group:* C2/m. $a = 19.905(1)$ $b = 7.098(1)$ $c = 5.405(1)$ $\beta = 96.349(5)^\circ$ $Z = 2$

X-ray Powder Pattern: Löhley quarry, Germany. 2.792 (100), 3.464 (76), 2.672 (54), 2.140 (52), 3.749 (45), 2.624 (43), 3.045 (37)

Chemistry:	(1)
SiO ₂	28.05
BaO	26.39
TiO ₂	18.53
Na ₂ O	6.75
MgO	4.58
FeO	4.48
CaO	2.3
SrO	2.23
MnO	1.44
K ₂ O	1.41
Nb ₂ O ₅	0.95
F	3.88
<u>-O=F₂</u>	<u>1.63</u>
Total	99.36

(1) Löhley quarry, Germany; average of 5 SEM-EDX analyses; corresponding to Ba_{1.50}Sr_{0.19}K_{0.26}Na_{1.89}Ca_{0.36}Mn_{0.18}Mg_{0.99}Fe_{0.54}Ti_{2.01}Nb_{0.06}Si_{4.06}O_{16.23}F_{1.77}.

Mineral Group: Lamprophyllite group.

Occurrence: Occurs in miarolitic cavities in an alkaline basalt.

Association: Nepheline, leucite, augite, magnetite, fluorapatite, perovskite, götzenite.

Distribution: Löhley quarry, Üdersdorf, near Daun, Eifel Mountains, Rhineland-Palatinate (Rheinland-Pfalz), Germany.

Name: For the old name of the first known locality, Liley, Germany.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia, 4106/1.

References: (1) Chukanov, N.V., I.V. Pekov, R.K. Rastsvetaeva, S.M. Aksenov, A.E. Zadov, K.V. Van, G. Blass, W. Shüller, and B. Ternes (2012) Lileyite, Ba₂(Na,Fe,Ca)₃MgTi₂(Si₂O₇)₂O₂F₂, a new lamprophyllite-group mineral from the Eifel volcanic area, Germany. *European Journal of Mineralogy*, 24, 181-188. (2) (2013) *Amer. Mineral.*, 98, 1080-1081 (abs. ref. 1).