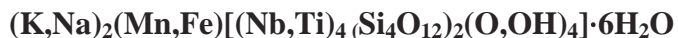


Gjerdingenite-Mn

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals prismatic on [010], to 1 mm, exhibiting {001}, {100}, { $\bar{2}$ 01} and {021}. Twinning (micro) observed on {001}.

Physical Properties: *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Uneven. Hardness = 5
D(meas.) = n.d. D(calc.) = 2.93

Optical Properties: Transparent to translucent. *Color:* Orange-yellow to brown. *Streak:* White.
Luster: Vitreous.

Optical Class: Biaxial (+). $\alpha = 1.670(2)$ $\beta = 1.685(2)$ $\gamma = 1.775(5)$ $2V(\text{meas.}) = 52(8)^\circ$
 $2V(\text{calc.}) = 46(5)^\circ$ *Dispersion:* Weak, $r < v$. *Orientation:* Z = a, Y = b. *Pleochroism:* Yellowish brown (Y) to colorless (X and Z).

Cell Data: Space Group: C2/m. $a = 14.563(3)$ $b = 13.961(3)$ $c = 7.851(2)$ $\beta = 117.62(3)^\circ$
Z = 2

X-ray Powder Pattern: Gjerdingselva, Lunner, Oppland, Norway.

6.96 (100), 3.22 (90), 4.94 (80), 3.10 (80), 2.510 (40), 6.40 (20), 1.431 (20), 3.90 (10)

Chemistry:

	(1)
Na ₂ O	1.45
K ₂ O	5.83
BaO	0.69
MgO	0.05
MnO	2.59
FeO	2.03
ZnO	0.54
Al ₂ O ₃	0.18
SiO ₂	38.55
TiO ₂	7.07
Nb ₂ O ₅	31.74
<u>H₂O</u>	<u>9.9(4)</u>
Total	100.62

(1) Gjerdingselva, Lunner, Oppland, Norway; average of 4 electron microprobe analyses, H₂O by LOI, H₂O and OH⁻ confirmed by IR spectroscopy, O/OH calculated for charge balance; corresponds to (K_{3.07}Na_{1.16}Ba_{0.11}) $\Sigma=4.34$ (Mn_{0.91}Fe_{0.70}Zn_{0.16}Mg_{0.03}) $\Sigma=1.80$ (Nb_{5.92}Ti_{2.19}) $\Sigma=8.11$ (Si_{15.91}Al_{0.09}O₄₈) [O_{6.32}(OH)_{1.68}] $\Sigma=8.00$ ·12.8H₂O.

Mineral Group: Labuntsovite group.

Occurrence: In miarolitic cavities, with little or no late-stage hydrothermal alteration, in a sodic alkaline granite.

Association: Gjerdingenite-Fe, aegirine, albite, elpidite, janhaughite, kupletskite, monazite-(Ce), orthoclase, pyrochlore, ralstonite.

Distribution: From Gjerdingselva, Lunner, Oppland, Norway.

Name: Root name is derived from the nearby Lake *Gjerdingen*. The suffix *-Mn* indicates the dominant cation in the *D* site of the structure.

Type Material: Mineralogical Collection, Freiberg University of Mining and Technology, Bergakademie, Freiberg, Germany, (80250).

References: (1) Raade, G., N.V. Chukanov, U. Kolitsch, S. Möckel, A.E. Zadov, and I.V. Pekov, (2004) Gjerdingenite-Mn from Norway - a new mineral species in the labuntsovite group: descriptive data and crystal structure. *Eur. J. Mineral.*, 16, 979-987. (2) (2005) *Amer. Mineral.*, 90, 1227 (abs. ref. 1).