Gjerdingenite-Mn  
\((K,Na)_2(Mn,Fe)[(Nb,Ti)_4(Si_2O_{12})(O,OH)]\cdot6\text{H}_2\text{O}\)

**Crystal Data:** Monoclinic.  
Point Group: 2/m.  
Crystals prismatic on [010], to 1 mm, exhibiting \{001\}, \{100\}, \{201\} 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(meas.) = 52(8)°  
2V(calc.) = 46(5)°  
Dispersion: Weak, \(r < v\).  
Orientation: \(Z = a, Y = b\).  
Pleochroism: Yellowish brown (Y) to colorless (X and Z).

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

**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:**

\[
\begin{array}{ll}
\text{Na}_2\text{O} & 1.45 \\
\text{K}_2\text{O} & 5.83 \\
\text{BaO} & 0.69 \\
\text{MgO} & 0.05 \\
\text{MnO} & 2.59 \\
\text{FeO} & 2.03 \\
\text{ZnO} & 0.54 \\
\text{Al}_2\text{O}_3 & 0.18 \\
\text{SiO}_2 & 38.55 \\
\text{TiO}_2 & 7.07 \\
\text{Nb}_2\text{O}_5 & 31.74 \\
\text{H}_2\text{O} & 9.9(4) \\
\text{Total} & 100.62
\end{array}
\]

(1) Gjerdingselva, Lunner, Oppland, Norway; average of 4 electron microprobe analyses, \(\text{H}_2\text{O}\) by LOI, \(\text{H}_2\text{O}\) and \(\text{OH}^-\) confirmed by IR spectroscopy, \(\text{O}/\text{OH}\) calculated for charge balance; corresponds to \((\text{K}_{0.07}\text{Na}_{1.16}\text{Ba}_{0.11})_{\Sigma=1.34}\text{(Mn}_{0.9}\text{Fe}_{0.7}\text{Zn}_{0.05}\text{Mg}_{0.03})_{\Sigma=1.80}\text{(Nb}_{5.92}\text{Ti}_{2.19})_{\Sigma=8.11}\text{(Si}_{15.91}\text{Al}_{0.09}\text{O}_{48})_{\Sigma=8.00}\cdot12.8\text{H}_2\text{O}.

**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).

(2) (2005) Amer. Mineral., 90, 1227 (abs. ref. 1).