

Gjerdingenite-Na **$K_2Na(Nb_3Ti)Si_8O_{24}(OH)_2O_2 \cdot 5H_2O$**

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals, to 0.5 mm, are equant, prismatic or tabular, and poorly formed, displaying {100}, {001} and {010}. Crystals curved or divergent; some are hollow. As cavernous, or massive granular pseudomorphs of vuonnemite, to 13 cm.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 5
D(meas.) = 2.71(1) D(calc.) = 2.69

Optical Properties: Transparent to translucent. *Color:* Colorless to pale pink, whitish pink and cream-colored. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (+). $\alpha = 1.647(2)$ $\beta = 1.653(2)$ $\gamma = 1.755(3)$ $2V(\text{meas.}) = 25(10)^\circ$
 $2V(\text{calc.}) = 28.5^\circ$ *Orientation:* $Y = b$. *Dispersion:* None.

Cell Data: *Space Group:* C2/m. $a = 14.6119(5)$ $b = 14.1426(6)$ $c = 7.9022(6)$
 $\beta = 117.432(6)^\circ$ $Z = 2$

X-ray Powder Pattern: Poudrette quarry, Mont Saint-Hilaire, Quebec, Canada.
3.249 (100), 7.044 (54), 3.252 (51), 4.995 (44), 6.510 (42), 7.102 (29), 3.148 (28)

Chemistry:	(1)	(2)		(1)	(2)
Na ₂ O	4.04	2.60	Fe ₂ O ₃	0.61	
K ₂ O	3.97	7.90	Al ₂ O ₃	0.20	
CaO	1.95		SiO ₂	41.02	40.30
BaO	0.92		TiO ₂	10.20	6.70
MnO	0.27		Nb ₂ O ₅	27.78	33.43
ZnO	0.17		<u>H₂O</u>	<u>9.85</u>	<u>9.07</u>
			Total	100.98	100.00

(1) Poudrette quarry, Mont Saint-Hilaire, Quebec, Canada; average of 9 electron microprobe analyses, H₂O by TGA; corresponding to $(K_{0.98}Na_{0.62}Ca_{0.37}Ba_{0.07})_{\Sigma=2.04}(Na_{0.90}Ca_{0.04}Mn_{0.04}Zn_{0.02})_{\Sigma=1.00}(Nb_{2.43}Ti_{1.49}Fe^{3+}_{0.09})_{\Sigma=4.01}(Si_{7.95}Al_{0.05})_{\Sigma=8}O_{24}[(OH)_{2.09}O_{1.91}]_{\Sigma=4} \cdot 5.32H_2O$.
(2) $K_2Na(Nb_3Ti)Si_8O_{24}(OH)_2O_2 \cdot 5H_2O$.

Mineral Group: Labuntsovite group, kuzmenkoite subgroup.

Occurrence: As alteration of vuonnemite formed in hydrothermal assemblages of peralkaline pegmatites related to agpaitic feldspathoidal syenites.

Association: Microcline, albite, aegirine, analcime, a eudialyte-group mineral, natrolite, epistolite, polyolithionite, steacyite, thorite, ekanite, brockite, fluorapatite, yofortierite, calcite, hemimorphite, sauconite (?), earthy Mn oxides.

Distribution: From the East Hill suite, De-Mix quarry (now part of the Poudrette quarry), Mont Saint-Hilaire, Quebec, Canada.

Name: Signifies the structural analog of *gjerdingenite*-Fe with dominant *Na* in the *D* structural site.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia (92112) and Canadian Museum of Nature, Ottawa, Canada (CMNMC 85457).

References: (1) Pekov, I.V., N.V. Chukanov, N.A. Yamnova, A.E. Zadov, and P. Tarassoff (2007) Gjerdingenite-Na and Gjerdingenite-Ca, two new mineral species of the labuntsovite group. *Can. Mineral.*, 45, 529-539. (2) Yamnova, N. A., I. V. Pekov, Yu. K. Kabalov, N. V. Chukanov, and J. Shneider (2007) Crystal structures of gjerdingenite-Ca and gjerdingenite-Na, new minerals of the labuntsovite group. *Doklady Akademii Nauk*, 414(1), 57-62 (in Russian), English translation *Doklady Chemistry*, 414(1), 109-114. (3) (2007) *Amer. Mineral.*, 92, 1776-1777 (abs. ref. 1).