

**Oneillite****Na<sub>15</sub>Ca<sub>3</sub>Mn<sub>3</sub>Fe<sub>3</sub>Zr<sub>3</sub>Nb(Si<sub>25</sub>O<sub>73</sub>)(O, OH, H<sub>2</sub>O)<sub>3</sub>(OH, Cl)<sub>2</sub>**

**Crystal Data:** Hexagonal. *Point Group:* 3. As anhedral grains to 2 mm.

**Physical Properties:** Cleavage: None. *Tenacity:* Brittle. *Fracture:* Uneven. Hardness = 5-6  
D(meas.) = 3.20(3) D(calc.) = 3.22 Nonfluorescent.

**Optical Properties:** Transparent to translucent. *Color:* Yellowish brown. *Streak:* White.  
*Luster:* Vitreous.

*Optical Class:* Uniaxial (-).  $\omega = 1.6450(3)$   $\varepsilon = 1.6406(3)$ ; some grains anomalously biaxial with 2V(meas.) up to 15°.

**Cell Data:** *Space Group:* R3.  $a = 14.2084(8)$   $c = 29.959(3)$   $Z = 3$

**X-ray Powder Pattern:** Poudrette quarry, Mont Saint-Hilaire, Quebec, Canada.  
2.964 (100), 2.844 (89), 11.348 (44), 3.389 (43), 4.291 (37), 6.021 (36), 3.150 (35)

<b>Chemistry:</b>	(1)		(1)
Na <sub>2</sub> O	13.60	Nd <sub>2</sub> O <sub>3</sub>	1.45
K <sub>2</sub> O	0.28	Gd <sub>2</sub> O <sub>3</sub>	0.20
CaO	2.90	SiO <sub>2</sub>	43.46
MnO	7.70	ZrO <sub>2</sub>	11.44
FeO	3.00	HfO <sub>2</sub>	0.16
SrO	0.09	Nb <sub>2</sub> O <sub>5</sub>	3.48
Al <sub>2</sub> O <sub>3</sub>	0.18	Ta <sub>2</sub> O <sub>5</sub>	0.14
Y <sub>2</sub> O <sub>3</sub>	0.78	Cl	0.76
La <sub>2</sub> O <sub>3</sub>	2.88	H <sub>2</sub> O	[0.63]
Ce <sub>2</sub> O <sub>3</sub>	5.14	- O = Cl	0.17
Pr <sub>2</sub> O <sub>3</sub>	0.48	Total	98.58

(1) Poudrette quarry, Mont Saint-Hilaire, Quebec, Canada; electron microprobe analysis supplemented by IR spectroscopy, H<sub>2</sub>O calculated; corresponds to (Na<sub>14.37</sub>REE<sub>1.53</sub>K<sub>0.20</sub>Sr<sub>0.03</sub>) $\Sigma=16.13$  (Ca<sub>1.77</sub>REE<sub>0.59</sub>Na<sub>0.66</sub>) $\Sigma=3.02$ (Mn<sub>2.76</sub>Y<sub>0.24</sub>) $\Sigma=3.00$ (Fe<sub>1.43</sub>Mn<sub>0.96</sub>Zr<sub>0.25</sub>) $\Sigma=2.64$ (Zr<sub>2.93</sub>Nb<sub>0.05</sub>Hf<sub>0.03</sub>) $\Sigma=3.01$ (Nb<sub>0.85</sub>Ta<sub>0.02</sub>) $\Sigma=0.87$ (Si<sub>24.77</sub>Al<sub>0.12</sub>) $\Sigma=24.89$ O<sub>73</sub>(O,OH,H<sub>2</sub>O)<sub>3.09</sub>[(OH)<sub>1.27</sub>Cl<sub>0.73</sub>] $\Sigma=2.00$ .

**Mineral Group:** Eudialyte group. Distinguished by Mn dominance in the M(1) site.

**Occurrence:** Along the contact between a vein of albite and its host nepheline syenite in an alkaline intrusive complex.

**Association:** Albite, sodalite, pyrite, aegirine.

**Distribution:** At the Poudrette quarry, Mont Saint-Hilaire, Quebec, Canada.

**Name:** Honors John J. O'Neill (1886-1966) of McGill University, who was the first to describe the geology of Mont Saint-Hilaire.

**Type Material:** Canadian Museum of Nature, Ottawa, Ontario (CMNMC 81565).

**References:** (1) Johnsen, O., J.D. Grice, and R.A. Gault (1999) Oneillite: a new Ca-deficient and REE-rich member of the eudialyte group from Mont Saint-Hilaire, Quebec, Canada. *Can. Mineral.*, 37, 1295-1301. (2) (2000) *Amer. Mineral.*, 85, 1323 (abs. ref. 1). (3) Johnsen, O. and J.D. Grice (1999) The crystal chemistry of the eudialyte group. *Can. Mineral.*, 37(4), 865-891.