Weloganite $Na_2Sr_3Zr(CO_3)_6 \cdot 3H_2O$

Crystal Data: Triclinic, pseudorhombohedral. *Point Group:* 1. Crystals, roughly hexagonal, tapering, the prism faces deeply grooved and striated, withrough pyramidal terminations and a flat pedion, to 10 cm; may be massive. *Twinning:* About [103] repeated at 120°.

Physical Properties: *Cleavage:* Perfect on pseudo-{0001}. *Fracture:* Conchoidal. Hardness = 3.5 D(meas.) = 3.20–3.22 D(calc.) = 3.208 Pyroelectric.

Optical Properties: Transparent to translucent. *Color:* Lemon-yellow, pale yellow, amber, commonly zoned in basal sections; colorless in thin fragments. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (–). $\alpha = 1.558(3)$ $\beta = 1.646(3)$ $\gamma = 1.648(3)$ 2V(meas.) = ∼15°

Cell Data: *Space Group:* $P1$. $a = 8.966(1)$ $b = 8.980(2)$ $c = 6.730(1)$ $\alpha = 102.72(2)°$ $\beta = 116.65(1)°$ $\gamma = 60.06(1)°$ Z = 1

X-ray Powder Pattern: Francon quarry, Canada.
2.809 (10), 4.35 (9), 2.590 (7), 2.227 (7), 2.009 (7), 6.03 (6), 1.961 (6)

Chemistry:

	(1)	(2)
CO_2	30.72	32.44
SiO_2	0.25	
ZrO_2	15.26	15.13
Fe_2O_3	0.03	
MgO	< 0.02	
CaO	1.14	
SrO	36.18	38.18
Na_2O	7.75	7.61
K_2O	0.02	
H_2O^+	7.85	
H_2O^-	0.11	
H_2O		6.64
Total	[99.29]	100.00

(1) Francon quarry, Canada; by XRF and AA, CO_2 by the Leco method, H_2O by the Penfield method, original total given as 99.20%; corresponds to $Na_{2.15}(Sr_{3.00}Ca_{0.18})_{\Sigma=3.18}Zr_{1.06}(CO_3)_6 \cdot 3.75H_2O$. (2) $Na_2Sr_3Zr(CO_3)_6 \cdot 3H_2O$.

Occurrence: In an alkalic sill (Francon quarry, Canada); associated with an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada).

Association: Calcite, quartz, dawsonite (Francon quarry, Canada).

Distribution: In Canada, from the Francon quarry, Montreal Island, Montreal; in a limestone quarry 15 km east; and at Mont Saint-Hilaire, Quebec.

Name: To honor William Edmond Logan (1798–1875), first Director of the Canadian Geological Survey.

Type Material: Canadian Geological Survey, Ottawa, Canada, 17257, 61337.

References: (1) Sabina, A.P., J.L. Jambor, and A.G. Plant (1968) Weloganite, a new strontium zirconium carbonate from Montreal Island, Canada. Can. Mineral., 9, 468–477. (2) (1969) Amer. Mineral., 54, 576 (abs. ref. 1). (3) (1969) Can. Mineral., 9, 654 (correction). (4) Chen, T.T. and G.Y. Chao (1975) X-ray crystallography of weloganite. Can. Mineral., 13, 22–26. (5) Grice, J.D. and G. Perrault (1975) The crystal structure of triclinic weloganite. Can. Mineral., 13, 209–216.