Pectolite $NaCa_2Si_3O_8(OH)$

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals may be tabular, but also commonly acicular, to 15 cm; radiating fibrous, spheroidal, or columnar; fine-grained, massive. *Twinning:* Twin axis [010] with composition plane ~{100}, common.

Physical Properties: *Cleavage:* Perfect on {100} and {001}. *Fracture:* Uneven. *Tenacity:* Brittle; tough when compact. Hardness = 4.5–5 D(meas.) = 2.84–2.90 D(calc.) = [2.87] May be triboluminescent.

Optical Properties: Translucent to opaque. *Color:* Colorless, whitish, grayish, yellowish; in thin section, colorless. *Luster:* Silky, subvitreous.
Optical Class: Biaxial (+). *Orientation:* $X \wedge c = 10°–19°$; $Y \wedge a = 10°–16°$; $Z \wedge b = 2°$. *Dispersion:* $r > v$, weak to very strong. $\alpha = 1.592–1.610$ $\beta = 1.603–1.615$ $\gamma = 1.630–1.645$ 2V(meas.) = 50°–63°

Cell Data: *Space Group:* $P\bar{1}$. $a = 7.9882(1)$ $b = 7.03996$ $c = 7.0247(1)$ $\alpha = 90.520°$ $\beta = 95.181°$ $\gamma = 102.469°$ Z = 2

X-ray Powder Pattern: Bergen Hill, New Jersey, USA.
2.921 (10), 3.10 (8), 3.90 (6), 3.33 (6b), 3.28 (6b), 2.739 (6), 2.600 (6)

Chemistry:

	(1)
SiO_2	54.18
Fe_2O_3	0.18
FeO	0.42
CaO	33.36
Na_2O	8.72
K_2O	0.88
H_2O	2.74
Total	100.48

(1) Thetford mines, Quebec, Canada; corresponds to $(Na_{0.93}K_{0.06})_{\Sigma=0.99}(Ca_{1.98}Fe^{2+}_{0.02})_{\Sigma=2.00}(Si_{2.99}Fe^{3+}_{0.01})_{\Sigma=3.00}O_8(OH)_{1.01}$.

Polymorphism & Series: A M2abc polytype exists; forms a series with sérandite.

Occurrence: A primary mineral in nepheline syenites. A hydrothermal mineral in cavities in basalts and diabases; in serpentinites and peridotites; from metamorphosed high-calcium rocks.

Association: Zeolites, datolite, prehnite.

Distribution: Numerous localities. On Mt. Baldo and Mt. Monzoni, Trentino-Alto Adige, Italy. In Germany, from Niederkirchen, near Wolfstein, and Rauschermühle, Rhineland-Palatinate. In Scotland, at Lendalfoot, Ayrshire. From Zlto, Sweden. In Russia, from the Lovozero and Khibiny massifs, Kola Peninsula. In the USA, from Paterson, Passaic Co., and Bergen Hill, Hudson Co., New Jersey; at Magnet Cove, Hot Spring Co., and on Granite Mountain, near Little Rock, Pulaski Co., Arkansas. In Canada, in fine crystals from the Jeffrey mine, Asbestos, and at Mont Saint-Hilaire, Quebec. At Ahmadnagar, Maharashtra, India. From Bou Agrao, High Atlas Mountains, Morocco. At Pilansberg, Transvaal, South Africa.

Name: From the Greek for *compact*, in allusion to its resistance to pulverization.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 373–374. (2) Deer, W.A., R.A. Howie, and J. Zussman (1978) Rock-forming minerals, (2nd edition), v. 2A, single-chain silicates, 564–574. (3) Hildebrand, F.A. (1953) Minimizing the effects of preferred orientation in X-ray powder diffraction patterns. Amer. Mineral., 38, 1051–1056. (4) Prewitt, C.T. (1967) Refinement of the structure of pectolite, $Ca_2NaHSi_3O_9$. Zeits. Krist., 125, 298–316. (5) Müller, W.F. (1976) On stacking disorder and polytypism in pectolite and serandite. Zeits. Krist., 144, 401–408.