Sérandite $Na(Mn^{2+},Ca)_2Si_3O_8(OH)$

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Prismatic to acicular crystals, elongated along [010]; bladed, blocky, or tabular crystals, flattened on {100}, to 20 cm. As radiating crystal aggregates; massive. *Twinning:* Around [010], with composition plane {100}; less commonly contact twinned by reflection on {110}.

Physical Properties: *Cleavage:* Perfect on {001}, {100}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 5–5.5 D(meas.) = 3.34 D(calc.) = 3.42

Optical Properties: Transparent to translucent. *Color:* Rose-red, orange, salmon-pink, light pink, colorless, brown, black; colorless in thin section. *Streak:* White. *Luster:* Vitreous to greasy; fibrous aggregates are dull to silky.
Optical Class: Biaxial (+). *Dispersion:* $r < v$, moderate. $\alpha = 1.668$ $\beta = 1.671$ $\gamma = 1.703$ 2V(meas.) = 39° 2V(calc.) = 39°

Cell Data: *Space Group:* $P\bar{1}$. $a = 7.683(1)$ $b = 6.889(1)$ $c = 6.747(1)$ $\alpha = 90.53(5)°$ $\beta = 94.12(2)°$ $\gamma = 102.75(2)°$ Z = 2

X-ray Powder Pattern: Mont Saint-Hilaire, Canada. (ICDD 25-723).
2.983 (100), 3.158 (90), 2.838 (65), 2.192 (60), 2.495 (45), 2.602 (35), 7.51 (25)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	48.72	49.88	CaO	10.42	2.62
Al_2O_3	0.29		Na_2O	7.38	8.63
Fe_2O_3	0.03		K_2O	0.26	0.01
FeO	1.33	0.13	H_2O^+	2.67	
MnO	28.99	37.33	H_2O^-	0.11	
MgO	0.06	0.13	H_2O		[1.27]
			Total	[100.26]	[100.00]

(1) Rouma Isle, Guinea; original total given as 100.46%. (2) Tanohata mine, Japan; by electron microprobe, H_2O by difference; corresponds to $Na_{1.00}(Mn^{2+}_{1.88}Ca_{0.17}Mg_{0.01})_{\Sigma=2.06}Si_{2.97}O_8(OH)$.

Polymorphism & Series: Forms a series with pectolite.

Occurrence: In sodalite xenoliths and pegmatites cutting syenites and nepheline syenites in an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada); in vugs in phonolite (Point of Rocks, New Mexico, USA); in a contact metamorphosed terrigenous volcanogenic manganese deposit (Tumannoe deposit, Russia).

Association: Sodalite, nepheline, aegirine, astrophyllite, arfvedsonite, eudialyte, leucophanite, analcime, villiaumite, fluorite (Rouma Isle, Guinea); analcime, aegirine, mangan-neptunite, microcline (Mont Saint-Hilaire, Canada).

Distribution: From Rouma Isle, Los Islands, Guinea. In the USA, at Point of Rocks, Colfax Co., New Mexico; from the Gem mine, San Benito Co., California; on Granite Mountain, near Little Rock, Pulaski Co., Arkansas. Large crystals from Mont Saint-Hilaire, and from near Saint-Amable, Quebec, Canada. In the Tanohata mine, Iwate Prefecture, Japan. At the Tumannoe deposit, Bol'shoi Santar Island, Okhotsk Sea, and on Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia.

Name: Honors J.M. Sérand, who aided the collection of type material.

Type Material: National Museum of Natural History, Washington, D.C., USA, 96515.

References: (1) Lacroix, A. (1931) Les pegmatites de la syénite sodalitique de l'île Rouma (Archipel de Los, Guinée française). Description d'un nouveau minéral (sérandite) qu'elles renferment. Compt. Rendus Acad. Sci. Paris, 192, 187–194 (in French). (2) (1931) Amer. Mineral., 16, 344 (abs. ref. 1). (3) Takéuchi, Y., Y. Kudoh, and T. Yamanaka (1976) Crystal chemistry of the serandite-pectolite series and related minerals. Amer. Mineral., 61, 229–237. (4) Mandarino, J.A. and V. Anderson (1989) Monteregian treasures. Cambridge Univ. Press, 183. (5) Richards, R.P. (1991) Twin laws for serandite from Mont Saint-Hilaire, Quebec. Rocks & Minerals, 66, 44 (abs.).