Namansilite $NaMn^{3+}Si_2O_6$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As stout prismatic crystals, to 2 mm, forming irregular pods and aggregates. *Twinning:* On {100}, simple; polysynthetic.

Physical Properties: *Cleavage:* Perfect on {110}; (110) $\wedge$ ($1\bar{1}0$) ~87°. *Tenacity:* Brittle. Hardness = ~6 D(meas.) = 3.51 D(calc.) = [3.61]

Optical Properties: Transparent. *Color:* Red-violet. *Streak:* Brownish violet.
Luster: Adamantine; vitreous to pearly.
Optical Class: Biaxial (–). *Pleochroism:* Strong; X = lemon-yellow to pale yellow-orange; Y = raspberry-red to brownish red; Z = blood-red to reddish purple. *Orientation:* $Y = b$; $X \wedge c$ = 19°–25°. *Dispersion:* Very weak. *Absorption:* $Z > Y > X$. α = 1.734–1.750 β = 1.769–1.85 γ = 1.835–1.87 2V(meas.) = 15°–85°

Cell Data: *Space Group:* $C2/c$. a = 9.500–9.513 b = 8.610–8.615 c = 5.353–5.356 β = 105.00°–105.12° Z = [4]

X-ray Powder Pattern: Woods mine, Australia.
2.925 (100), 2.883 (100), 6.29 (66), 2.499 (50), 2.495 (50), 4.305 (45), 1.579 (24)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	52.64	51.69	CaO	0.07	0.01
TiO_2	0.19	0.05	SrO	0.42	
Al_2O_3	0.20	0.08	BaO	0.05	
Fe_2O_3	1.65	1.11	Na_2O	13.81	13.10
Mn_2O_3	32.36	33.72	K_2O	0.05	
MgO	0.32	0.01	Total	[101.76]	99.77

(1) Irnimi deposit, Russia; by electron microprobe, average of six analyses, original total given as 101.16%; corresponds to $(Na_{1.01}Ca_{0.02}Sr_{0.01})_{\Sigma=1.04}(Mn_{0.93}Fe_{0.05}Mg_{0.02})_{\Sigma=1.00}(Si_{1.99}Al_{0.01}Ti_{0.01})_{\Sigma=2.01}O_6$. (2) Woods mine, Australia; by electron microprobe, average of five analyses; corresponds to $Na_{0.99}(Mn_{0.99}Fe_{0.03})_{\Sigma=1.02}Si_{1.99}O_6$.

Mineral Group: Pyroxene group.

Occurrence: In low-grade metamorphosed and highly oxidized Mn, Na-rich sediments.

Association: Taikanite, pectolite, manganoan amphiboles, manganoan orthoclase, manganoan vermiculite (Irnimi deposit, Russia); pectolite, potassic feldspar, braunite, quartz (Cerchiara mine, Italy); quartz, sérandite, aegirine, kôzulite (Woods mine, Australia).

Distribution: From the Irnimi deposit, Taikan Mountains, Khabarovsk Territory, Russia. In the Cerchiara mine, near Faggiona, Val di Vara, Liguria, Italy. From Australia, in the Hoskins mine, near Grenfell, and the Woods mine, 30 km north-northeast of Tamworth, New South Wales.

Name: For sodium, NAtrium; MANganese; and SILicon in the formula.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.

References: (1) Kalinin, V.V., I.M. Marsiy, Y.P. Dikov, N.V. Troneva, and N.V. Trubkin (1992) Namansilite $NaMn^{3+}Si_2O_6$ – a new silicate. Zap. Vses. Mineral. Obshch., 121(1) 89–94 (in Russian). (2) (1993) Amer. Mineral., 78, 1316 (abs. ref. 1). (3) Basso, R., G. Lucchetti, and A. Palenzona (1989) Crystallographic and chemical study on a natural C2/c ordered Na–Mn–clinopyroxene from Val di Vara (Northern Apennines, Italy). Neues Jahrb. Mineral., Monatsh., 59–68. (4) Ohashi, H., T. Osawa, and K. Tsukimura (1987) Refinement of the structure of manganese sodium dimetasilicate. Acta Cryst., C43, 605–607. (5) Kawachi, Y. and D.S. Coombs (1993) Namansilite, $NaMn^{3+}Si_2O_6$: a widespread clinopyroxene? Mineral. Mag., 57, 533–538.