Murakamiite $LiCa_2Si_3O_8(OH)$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As prismatic crystals and aggregates to 1.7 mm.

Physical Properties: *Cleavage*: Perfect on {100} and {001}. *Tenacity*: Brittle. *Fracture*: Splintery. Hardness = 4.5-5 D(meas.) = 2.86(1) D(calc.) = 2.85 Fluoresces purplish pink under SW UV.

Optical Properties: Translucent. *Color*: Colorless to white. *Streak*: White. *Luster*: Vitreous to silky.
Optical Class: Biaxial (+). $\alpha = 1.602(1)$ $\beta = 1.611(1)$ $\gamma = 1.643(1)$ 2V(meas.) = 56-59(2)° 2V(calc.) = 57° *Orientation*: $X \wedge c = 10\text{-}11°$, $Y \wedge a = 10\text{-}14°$, $Z \wedge b = 0\text{-}5°$. *Dispersion*: Weak, $r > v$.

Cell Data: *Space Group*: $P\bar{1}$. $a = 7.9098(2)$ $b = 7.0320(2)$ $c = 6.9863(2)$ $\alpha = 90.596(2)°$ $\beta = 95.589(2)°$ $\gamma = 102.767(2)°$ $Z = 2$

X-ray Powder Pattern: Iwagi Islet, Ehime Prefecture, Japan.
2.897 (100), 3.055 (49), 3.295 (41), 3.225 (33), 3.845 (20), 2.284 (19), 2.720 (15)

Chemistry:

	(1)	(2)	(3)
SiO_2	54.94	54.98	56.98
TiO_2	0.00	0.01	
Al_2O_3	0.01	0.00	
FeO	0.38	0.28	
MnO	0.80	0.56	
MgO	0.04	0.04	
CaO	34.14	33.63	35.45
Na_2O	4.37	4.21	
Li_2O	2.52	2.78	4.72
K_2O	0.00	0.01	
H_2O	2.80	2.80	2.85
Total	100.00	99.30	100.00

(1) Iwagi Islet, Ehime Prefecture, Japan; normalized average of 16 laser ablation-inductively coupled plasma-mass spectrometric analyses, H_2O by TG-DTA; corresponds to $(Li_{0.55}Na_{0.46})_{\Sigma=1.01}(Ca_{1.98}Mn_{0.03}Fe_{0.02})_{\Sigma=2.04}Si_{2.98}O_8(OH)_{1.01}$. (2) Iwagi Islet, Ehime Prefecture, Japan; average of 10 electron microprobe analyses, H_2O by TG-DTA, Li_2O by laser-induced breakdown spectroscopy; corresponds to $(Li_{0.61}Na_{0.44})_{\Sigma=1.05}(Ca_{1.96}Mn_{0.04}Fe_{0.01})_{\Sigma=2.01}Si_{2.99}O_8(OH)_{1.01}$. (3) $LiCa_2Si_3O_8(OH)$.

Polymorphism & Series: An ordered (CaMn) intermediate member of the pectolite-serandite series.

Occurrence: In a metasomatic aegirine-augite albitite.

Association: Aegirine-augite, pectolite, sugilite, albite.

Distribution: From the eastern part of Iwagi Islet, Ehime Prefecture, Japan.

Name: Honors Professor Emeritus Nobuhide Murakami (1923-1994) Department of Geology and Mineralogical Sciences, Faculty of Science, Yamaguchi University, Japan for his contributions to petrology and mineralogy, particularly the discovery of sugilite and katayamalite at Iwagi Islet.

Type Material: National Museum of Nature and Science, Tsukuba (NSM M44916) and the Geological and Mineralogical Museum, Faculty of Science, Yamaguchi University, Japan (95235G).

References: (1) Imaoka, T., M. Nagashima, T. Kano, J.-I. Kimura, Q. Chang, and C. Fukuda (2017) Murakamiite, $LiCa_2Si_3O_8(OH)$, a Li-analog of pectolite, from the Iwagi Islet, southwest Japan. Eur. J. Mineral., 29(6), 1045-1053. (2) (2018) Amer. Mineral., 103, 1712-1713 (abs. ref. 1).
(3) Nagashima, M., T. Imaoka, C. Fukuda, and T. Pettke (2018) Relationship between cation substitution and hydrogen-bond system in hydrous pyroxenoids with three-periodic single-chain of SiO_4 tetrahedra: pectolite, murakamiite, marshallsussmanite, serandite and tanohataite. Eur. J. Mineral., 30(3), 451-463.