## Momoiite $(Mn^{2+},Ca)_3(V^{3+},Al)_2Si_6O_3$

**Crystal Data**: Cubic. *Point Group*: $4/m\,\bar{3}\,2/m$. As granular aggregates, to 1 mm.

**Physical Properties**: *Cleavage*: None. *Fracture*: n.d. *Tenacity*: n.d.
Hardness = 6.5. D(meas.) = n.d. D(calc.) = 4.01

**Optical Properties**: Translucent. *Color*: Greenish yellow to emerald-green (less green with < V).
*Streak*: Dull green. *Luster*: Vitreous.
*Optical Class:* Isotropic. $n$ = 1.86(1)

**Cell Data**: *Space Group*: $Ia\bar{3}\,d$. $a$ = 11.9242(7) Z = 1

**X-ray Powder Pattern**: Kurase mine, Ehime Prefecture, Japan.
2.668 (100), 2.980 (78), 2.435 (42), 1.594 (30), 1.935 (21), 2.178 (20), 1.654 (20)

**Chemistry**:

| | (1) | (2) |
|---|---|---|
| CaO | 12.24 | |
| MnO | 24.74 | 44.04 |
| MgO | 0.28 | |
| FeO | 0.05 | |
| $Al_2O_3$ | 5.12 | |
| $V_2O_3$ | 21.96 | 18.60 |
| $SiO_2$ | 35.02 | 37.35 |
| Total | 99.41 | 100.00 |

(1) Kurase mine, Ehime Prefecture, Japan; average of 10 electron microprobe analyses, corresponding to $(Mn_{1.80}Ca_{1.12}Mg_{0.12})_{\Sigma=2.96}(V_{1.51}Al_{0.52})_{\Sigma=2.03}Si_{3.00}O_{12}$. (2) $(Mn^{2+})_3(V^{3+})_2Si_6O_3$.

**Mineral Group**: Garnet group.

**Polymorhism & Series**: Solid solution with spessartine, grossular, and goldmanite.

**Occurrence**: Product of the metamorphism of siliceous manganese-bearing rocks.

**Association**: Rhodonite, calcite, tephroite, goldmanite, spessartine, vuorelainenite (Kurase mine); rhodonite, tephroite, celsian, rhodochrosite, pyrophanite (Hokkejino mine); in quartz-free assemblages with rhodonite, tephroite, rhodochrosite, spessartine, nickeline, or in quartz-bearing assemblages with rhodonite, molybdenite, rhodochrosite, spessartine, Mn-rich vanadoallanite-(La) (Fujii mine).

**Distribution**: In Japan, at the Kurase mine, Ehime Prefecture, the Hokkejino mine, Kyoto Prefecture, the Fujii mine, Fukui Prefecture and from the Tanohata mine, Iwate Prefecture.

**Name**: Honors Hitoshi Momoi (1930-2002), who first recognized $Mn_3V_2Si_3O_{12}$ molecules in garnet.

**Type Material**: Hokkaido University Museum, Sapporo, Japan (#Mineral-07401).

**References**: (1) Tanaka, H., S. Endo, T. Minakawa, M. Enami, D. Nishio-Hamane, H. Miura, and A. Hagiwara (2010) Momoiite, $(Mn^{2+},Ca)_3(V^{3+},Al)_2Si_6O_3$, a new manganese vanadium garnet from Japan. Journal of Mineralogical and Petrological Sciences, 105, 92-96. (2) (2014) Amer. Mineral., 99, 554-555 (abs. ref. 1). (3) Matsubara, S., R. Miyawaki, K. Yokoyama, M. Shigeoka, H. Miyajima, Y. Suzuki, O. Murakami and T. Ishibashi (2010) Momoiite and nagashimalite from the Tanohata mine, Iwate Prefecture, Japan. Bull. Natl. Mus. Nat. Sci., Ser. C, 36, 1-6.