Magnesio-sadanagaite

$KCa_2[(Mg,Fe^{2+})_3(Al,Fe^{3+})_2](Si_5Al_3)O_{22}(OH)_2$

Crystal Data: Monoclinic. *Point Group:* m, 2, or $2/m$. As short prismatic or granular crystals, to a few hundred microns.

Physical Properties: *Cleavage:* Perfect on {110}. *Tenacity:* [Brittle.] Hardness = ~6 D(meas.) = n.d. D(calc.) = 3.27

Optical Properties: Semitransparent. *Color:* Dark brown to black; in thin section, paler with increasing silicon content. *Streak:* Very light brown. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Pleochroism:* X' = colorless; Z' = brownish yellow. *Orientation:* $Z \wedge c = 26°$. $\alpha = 1.674(2)$ $\beta = 1.686(2)$ $\gamma = 1.699(2)$ 2V(meas.) = 90° 2V(calc.) = 88°

Cell Data: *Space Group:* $C2$, Cm, or $C2/m$. $a = 9.964(2)$ $b = 18.008(3)$ $c = 5.354(2)$ $\beta = 105.55(2)°$ Z = 2

X-ray Powder Pattern: Myojin Island, Japan; identical to sadanagaite.
3.28 (100), 8.48 (80), 3.15 (70), 2.707 (60), 2.162 (55), 2.951 (50), 2.766 (45)

Chemistry:

	(1)
SiO_2	32.1
TiO_2	3.2
Al_2O_3	22.0
FeO	13.7
MnO	0.1
MgO	8.0
CaO	12.5
Na_2O	0.7
K_2O	3.8
Total	96.1

(1) Myojin Island, Japan; by electron microprobe, Fe^{2+}:Fe^{3+} calculated from stoichiometry and charge balance; corresponding to $(K_{0.75}Na_{0.22})_{\Sigma=0.97}Ca_{2.07}(Mg_{1.84}Fe^{2+}_{1.37}Al_{0.94}Fe^{3+}_{0.39}Ti_{0.38}Mn_{0.01})_{\Sigma=4.93}(Si_{4.95}Al_{3.05})_{\Sigma=8.00}O_{22}(OH)_2$.

Polymorphism & Series: Forms a series with potassic-magnesiosadanagaite.

Mineral Group: Amphibole (calcic) group: $Mg/(Mg+Fe^{2+}) > 0.5$; $Fe^{3+}/(Fe^{3+}+Al^{vi})$ 0.50; $(Na+K)_A \geq 0.5$; $Na_B < 0.67$; $(Ca+Na)_B \geq 1.34$; $Si < 5.5$; $Ti < 0.5$.

Occurrence: In lenses and irregularly shaped nodules in crystalline limestone; metamorphism reached amphibolite facies in an Fe, Al, Ti-rich sedimentary protolith.

Association: Clinopyroxene, vesuvianite, spinel-hercynite, titanite, ilmenite, apatite, perovskite, pargasite.

Distribution: On Myojin Island, Ehime Prefecture, Japan.

Name: For *magnesium* in its composition and similarity to *sadanagaite*.

Type Material: University of Tokyo, Tokyo, Japan.

References: (1) Shimazaki, H., M. Bunno, and T. Ozawa (1984) Sadanagaite and magnesio-sadanagaite, new silica-poor members of calcic amphibole from Japan. Amer. Mineral., 69, 465–471. (2) Rock, N.M.S. and B.E. Leake (1984) The International Mineralogical Association amphibole nomenclature scheme: computerization and its consequences. Mineral. Mag., 48, 211–227.