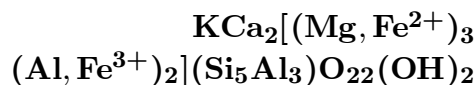


**Magnesio-sadanagaite**

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**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* =  $\sim 6$   
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:*  $Z \wedge c = 26^\circ$ .  $\alpha = 1.674(2)$   $\beta = 1.686(2)$   $\gamma = 1.699(2)$   $2V(\text{meas.}) = 90^\circ$   $2V(\text{calc.}) = 88^\circ$

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

**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 <sub>2</sub>	32.1
TiO <sub>2</sub>	3.2
Al <sub>2</sub> O <sub>3</sub>	22.0
FeO	13.7
MnO	0.1
MgO	8.0
CaO	12.5
Na <sub>2</sub> O	0.7
K <sub>2</sub> O	3.8
Total	96.1

(1) Myojin Island, Japan; by electron microprobe,  $\text{Fe}^{2+}:\text{Fe}^{3+}$  calculated from stoichiometry and charge balance; corresponding to  $(\text{K}_{0.75}\text{Na}_{0.22})_{\Sigma=0.97}\text{Ca}_{2.07}(\text{Mg}_{1.84}\text{Fe}_{1.37}\text{Al}_{0.94}\text{Fe}_{0.39}\text{Ti}_{0.38}\text{Mn}_{0.01})_{\Sigma=4.93}(\text{Si}_{4.95}\text{Al}_{3.05})_{\Sigma=8.00}\text{O}_{22}(\text{OH})_2$ .

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

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

**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.

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