

Magnesiosadanagaite**NaCa₂[Mg₃(Al,Fe³⁺)₂]Si₅Al₃O₂₂(OH)₂**

Crystal Data: Monoclinic. *Point Group:* 2/m. As rims ~150 μm thick on prismatic pargasite crystals to 3 mm.

Physical Properties: *Cleavage:* Perfect on {110}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 5.5-6 VHN = 665-792 (100 g load). D(meas.) = n.d. D(calc.) = 3.179

Optical Properties: Translucent. *Color:* Black. *Streak:* Reddish brown. *Luster:* Vitreous. *Optical Class:* Biaxial (+). $\alpha = 1.674(2)$ $\beta(\text{calc.}) = 1.683$ $\gamma = 1.694(2)$ $2V(\text{meas.}) = 80-90^\circ$ $2V(\text{calc.}) = \text{n.d.}$ *Orientation:* $Y = b, Z \wedge c = 20^\circ$. *Pleochroism:* $X = \text{pale yellow,}$ $Y = \text{yellowish brown,}$ $Z = \text{reddish brown.}$

Cell Data: *Space Group:* C2/m. $a = 9.857(2)$ $b = 17.899(4)$ $c = 5.318(1)$ $\beta = 105.36(1)^\circ$ $Z = 2$

X-ray Powder Pattern: Kasuga mine, Gifu Prefecture, central Japan. 8.38 (100), 2.56 (90), 3.11 (80), 2.70 (80), 2.34 (80), 2.58 (75), 1.587 (70)

Chemistry:	(1)		(2)		
	(1)	(2)	(1)	(2)	
SiO ₂	38.42	37.1	CaO	12.77	12.5
Al ₂ O ₃	22.20	20.9	Na ₂ O	3.14	3.33
TiO ₂	1.48	2.70	K ₂ O	0.92	0.49
Cr ₂ O ₃	0.60	0.01	F	0.94	0.29
FeO	1.92	[6.22]	Cl		0.02
Fe ₂ O ₃		[0.60]	H ₂ O	[1.66]	[1.92]
MnO		0.18	- O = F	0.40	0.12
MgO	15.81	13.4	Total	99.46	99.52

(1) Dattaw mine, Mogok Stone Tract, Myanmar; average of 10 electron microprobe analyses, H₂O calculated from structure analysis; corresponding to (Na_{0.82}K_{0.17}) $\Sigma=0.99$ (Ca_{1.95}Na_{0.05}) $\Sigma=2.00$ (Mg_{3.36}Fe²⁺_{0.23}Al_{1.20}Cr³⁺_{0.07}Ti⁴⁺_{0.16}) $\Sigma=5.02$ (Si_{5.47}Al_{2.53}) $\Sigma=8.00$ O₂₂[(OH)_{1.58}F_{0.42}]. (2) Kasuga mine, Japan; electron microprobe analysis, H₂O and FeO calculated; corresponds to (Na_{0.91}K_{0.09}) $\Sigma=1.00$ (Ca_{1.95}Na_{0.03}) $\Sigma=1.98$ (Mg_{2.90}Fe²⁺_{0.76}Al_{0.98}Fe³⁺_{0.07}Cr³⁺_{0.00}Ti⁴⁺_{0.30}Mn_{0.02}) $\Sigma=5.03$ (Si_{5.40}Al_{2.60}) $\Sigma=8.00$ O₂₂[(OH)_{1.58}F_{0.42}].

Mineral Group: Amphibole supergroup, calcium amphibole subgroup.

Occurrence: In a granitic contact aureole composed of dolomitic marble (Japan).

Association: Phlogopite, titanite, calcite, pyrrhotite, chalcopyrite (Japan); calcite, corundum, phlogopite (Myanmar).

Distribution: At the Dattaw mine, Mogok Stone Tract, Mandalay Division, Myanmar; from the Kawai pit, Kasuga mine, Gifu Prefecture, central Japan.

Name: Signifies an amphibole in the compositional range of *sadanagaite* with Mg dominant in the C structural site.

Type Material: National Science Museum, Tokyo (NSM-M28307) and at the Geological Museum, Geological Survey of Japan, Tsukuba (GSJ M35151), Japan.

References: (1) Banno, Y., R. Miyawaki, S. Matsubara, K. Makino, M. Bunno, S. Yamada, and T. Kamiya (2004) Magnesiosadanagaite, a new member of the amphibole group from Kasuga-mura, Gifu Prefecture, central Japan. *Eur. J. Mineral.*, 16, 177-183. (2) (2004) *Amer. Mineral.*, 89, 1829-1830 (abs. ref. 1). (3) Hawthorne, F.C. and G.E. Harlow (2008) The crystal chemistry of Al-rich amphiboles: sadanagaite and potassic-ferrisadanagaite. *Can. Mineral.*, 46, 151-162. (4) Hawthorne, F.C., R. Oberti, G.E. Harlow, W.V. Maresch, R.F. Martin, J.C. Schumacher, and M.D. Welch (2012) Nomenclature of the amphibole supergroup. *Amer. Mineral.*, 97, 2031-2048.