Vanadio-pargasite $NaCa_2Mg_4V[Si_6Al_2]O_{22}(OH)_2$

Crystal Data: Monoclinic. *Point group*: 2/*m*. As prismatic crystals to 0.8 mm that display{010} and {110} with typical amphibole striation.

Physical Properties: *Cleavage*: Perfect on {110}. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = ~6 VHS = 752-824, average 795 (50 g load). D(meas.) = 3.05(5) D(calc.) = 3.112

Optical Properties: Translucent. *Color*: Bright green to emerald-green, pale green in transmitted light. *Streak*: Pale green. *Luster*: Vitreous.
Optical Class: Biaxial (+) or (-). α = 1.643(2) β = 1.651(2) γ = 1.659 (2) 2V(meas.) = 86°(2) 2V(calc.) = – 89.6° *Orientation*: $Z \wedge c$ = 23-25°.

Cell Data: *Space Group: C*2/*m*. a = 9.8956(1) b = 17.9970(2) c = 5.2970(1) β = 105.391(1)° Z = 2

X-ray Powder Pattern: Pereval quarry, Irkutsk region, Siberia, Russia.
3.14 (100), 8.43 (40), 2.82 (35), 3.27 (30), 1.445 (25), 2.70 (18), 8.98 (15)

Chemistry:

	(1)		(1)
SiO_2	42.75	MnO	0.01
TiO_2	0.14	CaO	12.52
Al_2O_3	12.75	Na_2O	3.45
Cr_2O_3	0.44	K_2O	0.41
V_2O_3	5.92	F	0.61
MgO	19.15	H_2O	[1.75]
FeO	0.03	Total	99.91

(1) Pereval quarry, Irkutsk region, Siberia, Russia; average of 528 electron microprobe analyses supplemented by IR spectroscopy, H_2O calculated; corresponds to $^{A}(Na_{0.90}K_{0.07})$ $^{B}(Ca_{1.91}Na_{0.05}Mg_{0.04})_{\Sigma=2.00}{}^{C}(Mg_{4.02}V_{0.68}Al_{0.23}Cr_{0.05}Ti_{0.02})_{\Sigma=5.00}{}^{T}(Si_{6.09}Al_{1.91})_{\Sigma=8.00}O_{22}{}^{W}(OH_{1.67}F_{0.33})_{\Sigma=2.00}$.

Mineral Group: Calcium amphibole group; $^{B}(Ca + \Sigma M^{2+})/\Sigma B \geq 0.75$, $^{B}Ca/\Sigma B \geq {}^{B}\Sigma M^{2+}/\Sigma B$.

Occurrence: Formed during prograde (granulite-facies) metamorphism of Cr-V-bearing calcite-dolomite and siliceous sediments.

Association: Magnesiocoulsonite-magnesochromite, Cr-V-rich spinel, phlogopite, forsterite, Cr-V-bearing diopside, chlorite.

Distribution: From the Pereval marble quarry, near Sludyanka, Irkutsk region, southern Lake Baikal, Siberia, Russia.

Name: As a vanadium-bearing analog of *pargasite*, a monoclinic amphibole with Ca dominant as the B cation.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (5035/1, 5035/2, and 5035/3).

References: (1) Reznitsky, L.Z., E.V. Sklyarov, G. Cametti, T. Armbruster, L.F. Suvorova, Z.F. Ushchapovskaya, and I.G. Barash (2017) Vanadio-pargasite $NaCa_2Mg_4V[Si_6Al_2]O_{22}(OH)_2$ - new mineral of the amphibole group. Zap. Ross. Mineral. Obshch. (Proceedings of Russian Mineralogical Society), 146(6), 62-74 (in Russian). (2) Cametti, G., T. Armbruster, L.Z. Reznitsky, E.V. Sklyarov, and G. Della Ventura (2018) Crystal structure and crystal-chemistry of vanadio-pargasite: a new amphibole from southern Lake Baikal, Siberia, Russia. Eur. J. Mineral., 30(5), 981-987. (3) (2018) Amer. Mineral., 103, 2044-2045 (abs. refs. 1 & 2).