Potassic-magnesio-arfvedsonite $KNa_2(Mg_4Fe^{3+})Si_8O_{22}(OH)_2$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As prismatic to acicular crystals to 0.5 mm.

Physical Properties: *Cleavage*: Perfect on {110}. *Tenacity*: Brittle. *Fracture*: Splintery. Hardness = n.d. D(meas.) = 3.24 D(calc.) = 3.19 Nonfluorescent.

Optical Properties: Translucent. *Color*: Greenish brown. *Streak*: Gray-green. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α = 1.645(2) β = 1.655(2) γ = 1.660(2) 2V(meas.) = 60° 2V(calc.) = 70° *Pleochroism*: *X* = yellow pale-green, *Y* = green, *Z* = dark violet-brown. *Absorption*: *X* < *Y* < *Z*. *Dispersion*: Strong, *r* > *v*. *Orientation*: *X* ∧ *a* = 44° (in β obtuse), *Y* ∧ *c* = 30° (in β acute), *Z* = *b*.

Cell Data: *Space Group*: *C*2/*m*. *a* = 9.9804(11) *b* = 18.0127(19) *c* = 5.2971(6) β = 104.341(2)° Z = 2

X-Ray Diffraction Pattern: Calculated pattern.
2.715 (100.0), 8.519 (80.5), 2.542 (73.2), 3.402 (67.3), 3.173 (65.0), 2.591 (44.1), 2.174 (42.0)

Chemistry:

	(1)	(2)
SiO_2	53.61	56.63
Al_2O_3	0.04	
TiO_2	1.09	
Fe_2O_3	[7.00]	9.41
FeO	[11.04]	
MnO	0.33	
MgO	11.99	18.99
CaO	1.53	
Na_2O	6.32	7.30
K_2O	4.50	5.55
F	0.46	
H_2O	[1.59]	
$-O = F_2$	0.019	2.12
Total	99.60	100.00

(1) Buhovo-Seslavtsi pluton, Bulgaria; average electron microprobe analysis supplemented by Mössbauer spectroscopy, Fe_2O_3, FeO and H_2O calculated; corresponding to $^{A}(K_{0.86}Na_{0.07})_{\Sigma=0.93}$ $^{B}(Na_{1.75}Ca_{0.25}Mn^{2+}_{0.01})_{\Sigma=2.01}$ $^{C}(Mg_{2.67}Fe^{2+}_{1.42}Fe^{3+}_{0.76}Ti_{0.12}Mn^{2+}_{0.03})_{\Sigma=5.00}$ $^{T}Si_8O_{22}$ $^{W}[(OH)_{1.58}F_{0.22}O_{0.20}]_{\Sigma=2.00}$.
(2) $KNa_2(Mg_4Fe^{3+})Si_8O_{22}(OH)_2$.

Mineral Group: Amphibole supergroup.

Occurrence: In syenitic and granitic dikes the product of strongly peralkaline and potassic magma.

Association: Quartz, potassium feldspar, aegirine-augite, quartz, zircon, magnetite, ilmenite, titanite; hematite, pyrite, galena.

Distribution: From the Buhovo-Seslavtsi pluton, Bulgaria.

Name: Signifies an amphibole of the *arfvedsonite* group with dominant Mg^{2+} in the *C* site and dominant K^+ in the *A* site.

Type Material: Museum of Mineralogy and Petrology, Sofia University, Bulgaria (M7661).

References: (1) Dyulgerov, M., R. Oberti, B. Platevoet, M. Kadiyski, and V. Rusanov (2019) Potassic-magnesio-arfvedsonite, $KNa_2(MgFe^{2+}Fe^{3+})_5Si_8O_{22}(OH)_2$: mineral description and crystal chemistry. Mineral. Mag., 83, 465-472. (2) 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.