Melkovite $CaFe^{3+}_2Mo_5O_{10}(PO_4)_2(OH)_{12}\cdot 8H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. Crystals are pseudohexagonal, very thin, platy, to 2 μm, in powdery aggregates in veinlets.

Physical Properties: *Cleavage*: One, perfect. *Tenacity*: Brittle. Hardness = ~3
D(meas.) = 2.969-2.973 D(calc.) = 2.851

Optical Properties: Transparent. *Color*: Lemon-yellow, brownish yellow. *Luster*: Dull to waxy. *Optical Class*: Biaxial (?), anomalous blue interference color. *Pleochroism*: Weak; colorless to light green. *Orientation*: Extinction wavy to nearly parallel ⊥ to the cleavage. *n*(average) = 1.838

Cell Data: *Space Group*: *C*2/*m*. *a* = 18.81(9) *b* = 10.99(10) *c* = 15.11(9) β = 129.6(2)° Z = 2

X-ray Powder Pattern: Shunak Mountains, Kazakhstan.
2.916 (9), 3.537 (8), 8.42 (7), 3.036 (7), 1.789 (7), 1.992 (6), 2.415 (5)

Chemistry:

	(1)		(1)
Na_2O	0.77	SiO_2	0.19
K_2O	0.17	P_2O_5	5.97
CaO	6.15	As_2O_5	0.07
CuO	0.06	MoO_3	55.72
Fe_2O_3	10.37	H_2O	[20.52]
Al_2O_3	0.01	Total	100.00

(1) Shunak Mountains, Kazakhstan; normalized electron microprobe analysis, H_2O calculated, corresponds to $[(Ca_{1.27}Na_{0.51}K_{0.07}Cu^{2+}_{0.02})_{\Sigma=1.87}(H_2O)_{15.13}Ca(H_2O)_6][Mo_8(P_{1.74}As_{0.01}Si_{0.06})_{\Sigma=1.83}Fe^{3+}_{2.68}O_{33.17}(OH)_{3.83}]$.

Mineral Group: Betpakdalite supergroup, mendozavilite group.

Occurrence: Localized along joints in sandstone, formed by alteration of molybdenite in the oxidized zone of small molybdenite-fluorite deposits.

Association: Fluorite, molybdenite, magnetite, powellite, ferrimolybdite, iriginite, jarosite.

Distribution: In the Shunak Mountains, 60 km west of the Mointy railroad station, Kazakhstan [TL]. At Su Senargiu, Sardinia, Italy.

Name: Honors Professor Vyacheslav Gavrilovich *Melkov* (1911-1991), Russian mineralogist specializing in uranium minerals, of the All-Union Research Institute of Mineral Resources, Moscow, Russia. Existing name retained instead of 'mendozavilite-CaCa' by group nomenclature.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 72716; National Museum of Natural History, Washington, D.C., USA, 160237.

References: (1) Yegorov, B.L., A.D. Dara, and V.M. Senderova (1969) Melkovite, a new phosphomolybdate from the oxidized zone. Zap. Vses. Mineral. Obshch., 98, 207–212 (in Russian). (2) (1970) Amer. Mineral., 55, 320 (abs. ref. 1). (3) Kampf, A.R., S.J. Mills, M.S. Rumsey, M. Dini, W.D. Birch, J. Spratt, J.J. Pluth, I.M. Steele, R.A. Jenkins, and W.W. Pinch (2012) The heteropolymolybdate family: structural relations, nomenclature scheme and new species. Mineral. Mag., 76(5), 1175-1207.