

Melkovite**CaFe³⁺₂Mo₅O₁₀(PO₄)₂(OH)₁₂·8H₂O**

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:* C2/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)

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|-------------------|--------------------------------------|-------------------------------------|
| Chemistry: | (1) | (1) |
| | Na ₂ O 0.77 | SiO ₂ 0.19 |
| | K ₂ O 0.17 | P ₂ O ₅ 5.97 |
| | CaO 6.15 | As ₂ O ₅ 0.07 |
| | CuO 0.06 | MoO ₃ 55.72 |
| | Fe ₂ O ₃ 10.37 | H ₂ O [20.52] |
| | Al ₂ O ₃ 0.01 | Total 100.00 |

(1) Shunak Mountains, Kazakhstan; normalized electron microprobe analysis, H₂O calculated, corresponds to [(Ca_{1.27}Na_{0.51}K_{0.07}Cu²⁺_{0.02})_{Σ=1.87}(H₂O)_{15.13}Ca(H₂O)₆][Mo₈(P_{1.74}As_{0.01}Si_{0.06})_{Σ=1.83}Fe³⁺_{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, ferrimolybdate, 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. Obsch.*, 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.