Magnocolumbite (Mg, Fe\(^{2+}\), Mn\(^{2+}\))(Nb, Ta)\(_2\)O\(_6\)

Crystal Data: Orthorhombic. Point Group: 2/m 2/m 2/m. Rough crystals, tabular to acicular, to 1.5 cm, with nine forms noted. Twinning: Common, with a 25° angle between extinction directions.


Optical Properties: Opaque, translucent on thin edges. Color: Black to brownish black; brown, brownish red to reddish brown in transmitted light. Streak: Dark brown. Luster: Semimetallic. Optical Class: Biaxial (−). Pleochroism: Distinct; \(X = \) brownish yellow; \(Z = \) brownish red. Orientation: \(X = b; Y = a; Z = c\). \(\alpha = 2.33–2.36\) \(\beta = \) n.d. \(\gamma = 2.39–2.44\)

Optical Data: 2V(meas.) = ∼80°

Cell Data: Space Group: \[Pbcn\] (by analogy to ferrocolumbite). \(a = 14.17\) \(b = 5.65\) \(c = 5.02\) \(Z = 4\)

X-ray Powder Pattern: Kukhi-Lal deposit, Tajikistan. 2.955 (10), 1.723 (9), 1.535 (9), 1.470 (9), 1.454 (9), 1.197 (9), 1.105 (9)

Chemistry: (1) \(\text{WO}_3\) 0.86 \(\text{Nb}_2\text{O}_5\) 70.59 68.27 \(\text{Ta}_2\text{O}_5\) 10.45 16.20 \(\text{SiO}_2\) 0.46 \(\text{TiO}_2\) 4.61 1.40 \(\text{Al}_2\text{O}_3\) 1.12 \(\text{Fe}_2\text{O}_3\) 0.30 \(\text{FeO}\) 2.21 4.55 \(\text{MnO}\) 0.17 0.18 \(\text{MgO}\) 9.00 9.40 Total 99.77 100.00

(1) Kukhi-Lal deposit, Tajikistan; corresponds to (Mg\(_{0.71}\)Fe\(^{2+}\)\(_{0.10}\)Mn\(^{2+}\)\(_{0.10}\)Al\(_{0.07}\)Fe\(^{3+}\)\(_{0.01}\))Σ=0.99 \(\text{Nb}_1\text{Ti}_{0.18}\text{Ta}_{0.15}\text{W}_{0.01}\)Σ=2.03O\(_6\). (2) “Eastern Siberia, Russia”; corresponds to (Mg\(_{0.89}\)Fe\(^{2+}\)\(_{0.21}\))Σ=1.10\(\text{Nb}_1\text{Ta}_{0.24}\text{Ti}_{0.06}\)Σ=2.00O\(_6\).

Occurrence: In a pegmatite in partially assimilated dolomitic marbles (Kukhi-Lal deposit, Tajikistan).

Association: Ilmenorutile, cordierite, dravite, spinel, andalusite, kyanite (Kukhi-Lal deposit, Tajikistan).

Distribution: In the Kukhi-Lal deposit, Pyandzh River valley, southwestern Pamir Mountains, Tajikistan. From an undisclosed locality in “eastern Siberia”, Russia.

Name: For dominant MAGNeSium in the composition, and its relation to ferrocolumbite.

Type Material: n.d.