Magnocolumbite $(Mg, Fe^{2+}, Mn^{2+})(Nb, Ta)_2O_6$

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.

Physical Properties: *Cleavage:* {100} and {001}. *Fracture:* Uneven. Hardness = 6
D(meas.) = 5.17–5.25 D(calc.) = 5.23

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:* $X = b$; $Y = a$; $Z = c$. α = 2.33–2.36 β = n.d. γ = 2.39–2.44
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)	(2)
WO_3	0.86	
Nb_2O_5	70.59	68.27
Ta_2O_5	10.45	16.20
SiO_2	0.46	
TiO_2	4.61	1.40
Al_2O_3	1.12	
Fe_2O_3	0.30	
FeO	2.21	4.55
MnO	0.17	0.18
MgO	9.00	9.40
Total	99.77	100.00

(1) Kukhi-Lal deposit, Tajikistan; corresponds to $(Mg_{0.71}Fe^{2+}_{0.10}Mn^{2+}_{0.10}Al_{0.07}Fe^{3+}_{0.01})_{\Sigma=0.99}(Nb_{1.69}Ti_{0.18}Ta_{0.15}W_{0.01})_{\Sigma=2.03}O_6$. (2) "Eastern Siberia, Russia"; corresponds to $(Mg_{0.80}Fe^{2+}_{0.21})_{\Sigma=1.01}(Nb_{1.70}Ta_{0.24}Ti_{0.06})_{\Sigma=2.00}O_6$.

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.

References: (1) Mathias, V.V., L.N. Rossovskii, A.N. Shostatskii, and N.M. Kumskova (1963) Magnocolumbite, a new mineral. Doklady Acad. Nauk SSSR, 148, 420–423 (in Russian). (2) (1963) Amer. Mineral., 48, 1182–1183 (abs. ref. 1). (3) Nedashkovskii, P.G., N.A. Minaeva, K.P. Tolok, and I.F. Brovchuk (1967) A new occurrence of magnocolumbite. Zap. Vses. Mineral. Obshch., 96, 720–723 (in Russian). (4) Kornetova, V.A., M.E. Kazakova, and V.B. Aleksandrov (1971) Ilmenorutile from the pegmatites of Kukhi-Lal precious spinel deposits in the southwestern Pamirs and modifications in the formula of magnocolumbite. Trudy Mineral. Muzeya Akad. Nauk SSSR, 20, 107–113 (in Russian). (5) (1972) Chem. Abs., 76, 175 (abs. ref. 4).