Ferrimolybdite $Fe_2^{3+}(MoO_4)_3 \cdot 8H_2O(?)$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. As crusts of needlelike to fibrous crystals, to 2 mm, in tufted to radial aggregates; powdery, earthy, in films, massive.

Physical Properties: Hardness = 1–2 D(meas.) = 2.99 D(calc.) = 3.085

Optical Properties: Transparent to translucent. *Color:* Canary-yellow, straw-yellow, greenish yellow; colorless to canary-yellow in transmitted light. *Streak:* Pale yellow. *Luster:* Adamantine to silky, earthy.
Optical Class: Biaxial (+). *Pleochroism:* $X = Y$ = clear to nearly colorless; Z = dirty gray to canary-yellow. *Orientation:* $Z \parallel$ elongation. *Dispersion:* $r < v$, marked. α = 1.72–1.81 β = 1.73–1.83 γ = 1.85–2.04 2V(meas.) = ∼0° to 28°.

Cell Data: *Space Group:* $Pmmn$ or $Pm2_1n$. $a = 6.665(2)$ $b = 15.423(5)$ $c = 29.901(8)$ Z = 8

X-ray Powder Pattern: Huanglongpu deposit, China.
8.330 (100), 6.841 (69), 9.98 (65), 7.674 (59), 6.732 (26), 3.827 (17), 3.066 (14)

Chemistry:

	(1)	(2)	(3)
MoO_3	60.80	61.03	58.70
SiO_2		1.82	
Fe_2O_3	21.84	17.75	21.71
H_2O^+		13.74	
H_2O^-		5.88	
H_2O	17.36		19.59
Total	[100.00]	100.22	100.00

(1) Santa Rita Mountains, Pima Co., Arizona, USA; average of two analyses, recalculated to 100% after deduction of insoluble 2.66%; corresponds to $Fe_{1.94}(MoO_4)_{3.00} \cdot 6.84H_2O$.
(2) Huanglongpu deposit, China; corresponds to $Fe_{1.68}Si_{0.23}(Mo_{1.07}O_4)_{3.00} \cdot 8.22H_2O$.
(3) $Fe_2(MoO_4)_3 \cdot 8H_2O$.

Occurrence: An uncommon secondary mineral in the oxidized portions of hydrothermal vein and porphyry-type molybdenum-bearing deposits.

Association: Molybdenite, pyrite, chalcopyrite.

Distribution: Widely distributed, but commonly in small amounts. Studied material from the Alekseevskii mine, Khakassia district, Siberia, Russia. At Vielsalm, Belgium. In the USA, abundant in the Climax mine, Lake Co., Colorado; in Sulfur Gulch, Questa, Taos Co., New Mexico; from Mineral Park, Mohave Co., Arizona; in the Little Cottonwood district, Salt Lake Co., Utah. From the Kingsgate district and elsewhere, New South Wales, Australia. In the Huanglongpu deposit, Jinduicheng, Shaanxi Province, China.

Name: For the essential chemical components, FERRIc iron and MOLYBDate anionic group.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 1095–1097. (2) Kerr, P.F., A.W. Thomas, and A.M. Langer (1963) The nature and synthesis of ferrimolybdite. Amer. Mineral., 48, 14–32. (3) Huang, D., X. Jiang, Y. Wang, and F. Nie (1986) Type, origin and rhenium distribution of the Huanglongpu molybdenum (lead) deposit in Shaanxi province. Bull. Inst. Mineral Deposits, Chinese Acad. Geol. Sci., 6(4), 1–93 (in Chinese with English abs.). (4) Horn, E., M. Kurahashi, D. Huang, and C. Wu (1995) Crystal data and X-ray powder-diffraction data for ferrimolybdite, $Fe_2(MoO_4)_3 \cdot 6.8H_2O$. Powder Diffraction, 10, 101–103.