

Crystal Data: Hexagonal. *Point Group:* $\bar{3}$ or 3. Very fine granular, to 5 μm , in porous aggregates; massive.

Physical Properties: Hardness = Soft. $D(\text{meas.}) = 3.50\text{--}3.60$ $D(\text{calc.}) = 3.598$

Optical Properties: Opaque. *Color:* Brown to brownish black; grayish white in reflected light, with brown internal reflections.

Optical Class: Uniaxial. *Anisotropism:* Distinct.

R: (470) 23.0, (546) 19.9, (589) 19.1, (650) 18.6

Cell Data: *Space Group:* $[R\bar{3}$ or $R3]$ (by analogy to the chalcophanite group). $a = [7.54]$
 $c = [20.82]$ $Z = [6]$

X-ray Powder Pattern: Lu Village, China; nearly indistinguishable from chalcophanite and aurorite.

6.965 (100), 2.230 (23), 3.483 (11), 4.086 (8), 2.449 (7), 2.396 (6), 5.539 (3)

Chemistry:

	(1)	(2)
SiO_2	1.20	3.94
MnO_2	67.65	68.49
Al_2O_3	0.78	0.91
Fe_2O_3	0.52	1.41
MnO	8.02	0.92
MgO	5.29	8.52
CaO	1.97	2.03
H_2O^+	13.37	12.60
P_2O_5	0.59	1.63
Total	99.39	100.45

(1) Lu Village, China; corresponds to $(\text{Mg}_{0.51}\text{Mn}_{0.44}^{2+}\text{Ca}_{0.08})_{\Sigma=1.03}\text{Mn}_{3.03}^{4+}\text{O}_{7.10} \cdot 2.90\text{H}_2\text{O}$. (2) Do.; corresponds to $(\text{Mg}_{0.85}\text{Mn}_{0.05}^{2+}[\text{Ca}_{0.08}])_{\Sigma=0.98}\text{Mn}_{3.15}^{4+}\text{O}_{7.20} \cdot 2.80\text{H}_2\text{O}$.

Occurrence: A hypogene mineral in manganese ore (Lu Village, China); authigenic in manganese oxide concretions in siltstone (San Felipe, Mexico).

Association: Hydrated manganese oxides (Lu Village, China); magnetite, maghemite, goethite, hematite, calcite, quartz, mica, clay minerals (San Felipe, Mexico).

Distribution: In China, near Lu Village, Jianshui Co., Yunnan Province. From 56 km south of San Felipe, Baja California, Mexico.

Name: For its occurrence in Jianshui Co., Yunnan Province, China.

Type Material: Geology Exhibit Museum, Yunnan; Museum of Geology, Beijing, China.

References: (1) Yan Guyian, Zhang Shanghua, Zhao Mingkai, Ding Jianping, and Li Deyu (1992) Jianshuiite: a new magnesium mineral of the chalcophanite group. *Acta Mineral. Sinica*, 12(1), 69–77 (in Chinese with English abs.). (2) (1994) *Amer. Mineral.*, 79, 185 (abs. ref. 1). (3) Potter, R.M., and G.R. Rossman (1979) A magnesium analogue of chalcophanite in manganese-rich concretions from Baja California. *Amer. Mineral.*, 64, 1227–1229. (4) Grice, J.D., B. Gartrell, R.A. Gault, and J. Van Velthuisen (1994) Ernie nickelite, $\text{NiMn}_3\text{O}_7 \cdot 3\text{H}_2\text{O}$, a new mineral species from the Siberia complex, Western Australia: comments on the chalcophanite group. *Can. Mineral.*, 32, 333–337.