

Mianningite**Crystal Data:** Hexagonal. *Point Group:* $\bar{3}$. As tabular crystals to 2 cm.**Physical Properties:** *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Conchoidal. Hardness = ~ 6 VHN = 72.2-89.2 (200 g load). D(meas.) = 4.62(8) D(calc.) = 4.77 Partially metamict.**Optical Properties:** Opaque. *Color:* Black; grayish white in reflected light. *Streak:* Black. *Luster:* Submetallic.*Optical Class:* n.d. Weakly anisotropic.R₁-R₂: (400) 18.6-16.4, (420) 19.9-18.9, (440) 19.8-18.9, (460) 19.2-18.5, (480) 18.8-18.1, (500) 18.5-17.9, (520) 18.2-17.6, (540) 18.0-17.4, (560) 17.7-17.1, (580) 17.5-16.9, (600) 17.3-16.7, (620) 17.1-16.5, (640) 17.0-16.3, (660) 16.8-16.1, (680) 16.8-16.1, (700) 16.5-15.7**Cell Data:** *Space Group:* R $\bar{3}$. *a* = 10.3462(5) *c* = 20.837(2) *Z* = 3**X-ray Powder Pattern:** Baozi Hill, Mianning county, Sichuan province, China. 2.627 (100), 2.144 (100), 3.065 (75), 2.254 (70), 1.545 (60), 2.883 (55), 2.476 (55)

Chemistry:	(1)		(1)
P ₂ O ₅	0.03	Y ₂ O ₃	0.55
V ₂ O ₅	0.57	La ₂ O ₃	0.67
Nb ₂ O ₅	0.59	Ce ₂ O ₃	1.12
SiO ₂	0.02	Nd ₂ O ₃	0.11
TiO ₂	53.12	MgO	0.05
ZrO ₂	0.15	CaO	0.03
ThO ₂	0.15	MnO	1.11
UO ₂	[6.44]	SrO	0.20
UO ₃	[1.71]	BaO	0.30
Al ₂ O ₃	0.07	PbO	2.56
Cr ₂ O ₃	0.07	Na ₂ O	0.21
FeO	[0.93]	<u>K₂O</u>	<u>0.09</u>
Fe ₂ O ₃	[27.75]	Total	98.60

(1) Baozi Hill, Mianning county, Sichuan province, China; average of 22 electron microprobe analyses, UO₂, UO₃, FeO and Fe₂O₃ calculated from UO₂ total and Fe₂O₃ total and XPS data; corresponds to $[\square_{0.322}(\text{Pb}_{0.215}\text{Ba}_{0.037}\text{Sr}_{0.036}\text{Ca}_{0.010})_{\Sigma=0.298}(\text{Ce}_{0.128}\text{La}_{0.077}\text{Nd}_{0.012})_{\Sigma=0.217}(\text{Na}_{0.127}\text{K}_{0.036})_{\Sigma=0.163}]_{\Sigma=1.000}(\text{U}^{4+}_{0.447}\text{Mn}_{0.293}\text{U}^{6+}_{0.112}\text{Y}_{0.091}\text{Zr}_{0.023}\text{Th}_{0.011})_{\Sigma=0.977}(\text{Fe}^{3+}_{1.224}\text{Fe}^{2+}_{0.243}\text{Mg}_{0.023}\text{P}_{0.008}\text{Si}_{0.006}\square_{0.496})_{\Sigma=2.000}(\text{Ti}_{12.464}\text{Fe}^{3+}_{5.292}\text{V}^{5+}_{0.118}\text{Nb}_{0.083}\text{Al}_{0.026}\text{Cr}^{3+}_{0.017})_{\Sigma=18.000}\text{O}_{38}$.

Mineral Group: Crichtonite group.**Occurrence:** In fractures within lamprophyre veins and their contacts with a later quartz-alkali feldspar syenite dike containing REE, U, and Th mineralization.**Association:** Microcline, albite, quartz, iron-rich phlogopite, augite, muscovite, calcite, barite, fluorite, epidote, magnetite, hematite, galena, hydroxylapatite, titanite, ilmenite, rutile, garnet-group minerals, zircon, allanite-(Ce), monazite-(Ce), bastnasite-(Ce), parasite-(Ce), maoniupingite-(Ce), thorite, pyrochlore-group minerals, chlorite.**Distribution:** From Baozi Hill, near the Maoniuping REE mine, Mianning county, Sichuan province, China.**Name:** For the county in China that provided the first specimens.**Type Material:** Geological Museum of China, Beijing, China (M12189).**References:** (1) Xiangkun Ge, Guang Fan, Guowu Li, Ganfu Shen, Zhangru Chen, and Yujie Ai (2017) Mianningite, $(\square, \text{Pb}, \text{Ce}, \text{Na})(\text{U}^{4+}, \text{Mn}, \text{U}^{6+})\text{Fe}^{3+}_2 (\text{Ti}, \text{Fe}^{3+})_{18}\text{O}_{38}$, a new member of the crichtonite group from Maoniuping REE deposit, Mianning county, southwest Sichuan, China. *Eur. J. Mineral.*, 29(2), 331-338. (2) (2018) *Amer. Mineral.*, 103, 334-335 (abs. ref. 1).