Maoniupingite-(Ce)  
(\(\text{Ce, Ca})_4(\text{Fe}^{3+}, \text{Ti, Fe}^{2+}, \square)(\text{Ti, Fe}^{3+}, \text{Fe}^{2+}, \text{Nb})_4\text{Si}_4\text{O}_{22}\))

Crystal Data: Hexagonal. Point Group: 3. As subhedral to euhedral tabular crystals, to 2 cm.


Cell Data: Space Group: \(R\bar{3}\). \(a = 10.3462(5)\)  \(c = 20.837(2)\)  \(Z = 3\)

X-ray Powder Pattern: Baozi Hill, near the Maoniuping REE deposit, 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)  
P_2O_5 0.03  Fe_2O_3 27.75  
V_2O_5 0.57  Y_2O_3 0.55  
Nb_2O_5 0.59  La_2O_3 0.67  
SiO_2 0.02  Ce_2O_3 1.12  
TiO_2 53.12  Nd_2O_3 0.11  
ZrO_2 0.15  MgO 0.05  
ThO_2 0.15  CaO 0.03  
UO_2 total 8.05  MnO 1.11  
UO_2 [6.44]  SrO 0.20  
UO_3 [1.71]  BaO 0.30  
Al_2O_3 0.07  PbO 2.56  
Cr_2O_3 0.07  Na_2O 0.21  
Fe_2O_3 total 28.78  K_2O 0.09  
FeO [0.93]  Total 98.60

(1) Baozi Hill, near the Maoniuping REE deposit, China; average electron microprobe analysis supplemented by X-ray photoelectron spectroscopy, UO_2 and UO_3 calculated from total UO_2, FeO and Fe_2O_3 calculated from total Fe_2O_3; corresponds to \([\text{Ce}_{0.128}\text{La}_{0.007}\text{Nd}_{0.0012}\text{Ta}_{0.17}][\text{Na}_{0.125}\text{K}_{0.036}\text{Ca}_{0.163}]_{\text{Zr}_{0.112}\text{Y}_{0.09}}\text{Zr}_{0.023}\text{Th}_{0.011}]_{\text{Zr}_{0.07}\text{Ca}_{0.34}\text{Y}_{0.11}}\text{O}_{0.118}\text{Nb}_{0.083}\text{Al}_{0.026}\text{Cr}_{0.017}]_{\text{Zr}_{0.07}\text{Ca}_{0.34}\text{Y}_{0.11}}\text{O}_{0.118}

Mineral Group: Crichtonite group.

Occurrence: In fractures in lamprophyre veins and along the contact between lamprophyre and a later quartz-alkali feldspar syenite dike with REE mineralization.

Association: Microcline, albite, quartz, iron-rich phlogopite, augite, muscovite, calcite, baryte, fluorite, epidote, pyrite, magnetite, hematite, galena, hydroxylapatite, titanite, ilmenite, rutile, garnet-group minerals, zircon, allanite-(Ce), monazite-(Ce), bastnäsite-(Ce), parsite-(Ce), maoniupingite-(Ce), thorite, pyrochlore-group minerals, chlorite.

Distribution: From Baozi Hill, near the Maoniuping REE deposit, Mianning county, Sichuan province, China.

Name: For the occurrence near the Maoniuping REE deposit, China.

Type Material: Geological Museum of China, Beijing (M12189).

References: (1) X. Ge, G. Fan, G. Li, G. Shen, Z. Chen, and Y. Ai (2017) Mianningite, \((\square,\text{Pb, Ce, Na})_4\text{U}^{4+}\text{Mn}^{4+}\text{Fe}^{3+}2(\text{Ti, Fe}^{3+})_3\text{Si}_4\text{O}_{12}\), a new member of the crichtonite group from Maoniuping REE deposit, Mianning county, southwest Sichuan, China. Eur. J. Mineral., 29, 331-8.