## Mapiquiroite $(Sr,Pb)(U,Y)Fe_2(Ti,Fe^{3+})_{18}O_{38}$

**Crystal Data**: Hexagonal. *Point Group*: $\bar{3}$. As rhombohedral or tabular pseudohexagonal crystals to 5 mm.

**Physical Properties**: *Cleavage*: None. *Fracture*: Irregular. *Tenacity*: Brittle. Hardness = ~ 6 VHN = 750-782 (500 g load). D(meas.) = n.d. D(calc.) = 4.483 (Monte Arsiccio mine) D(calc.) = 4.670 (Buca della Vena mine ) Metamict.

**Optical Properties**: Opaque (presumably). *Color*: Black. *Streak*: Black. *Luster*: Submetallic. *Optical Class*: n.d. *Bireflectance*: Weak. *Anisotropism*: Distinct. *Pleochroism*: None. $R_1$-$R_2$: (471.1) 17.0-17.7, (548.3) 16.7-17.6, (586.6) 16.4-17.3, (652.3) 16.1-17.0

**Cell Data**: *Space Group*: $R\bar{3}$. $a$ = 10.3719(7) $c$ = 20.875(1) Z = 3 (After heating at 85° C)

**X-ray Powder Pattern**: Calculated pattern due to metamict state of natural material. 5.18 (100), 6.81 (76), 4.51 (44), 3.404 (41), 2.994 (35), 4.125 (29), 2.889 (29)

| **Chemistry**: | (1) | (2) | | (1) | (2) |
|---|---|---|---|---|---|
| $Na_2O$ | 0.05 | 0.03 | SrO | 3.01 | 1.68 |
| CaO | 0.08 | 0.04 | $Y_2O_3$ | 1.26 | 0.41 |
| MnO | 0.28 | 0.02 | $Nb_2O_5$ | 0.05 | 0.21 |
| ZnO | n.d. | 1.29 | $SnO_2$ | 0.11 | 0.01 |
| $Al_2O_3$ | 0.09 | 0.08 | $La_2O_3$ | 1.56 | 0.08 |
| $TiO_2$ | 54.14 | 50.14 | $Ce_2O_3$ | 0.90 | 0.18 |
| $V_2O_5$ | 0.64 | 1.76 | PbO | 1.28 | 2.88 |
| $Cr_2O_3$ | 6.73 | 0.06 | $UO_2$ | 5.99 | 12.05 |
| $Fe_2O_3$ | 23.28 | 27.74 | Total | 99.45 | 98.66 |

(1) Buca della Vena mine, Apuan Alps, Tuscany, Italy; electron microprobe analysis; corresponding to $(Sr_{0.533}La_{0.176}Pb_{0.105}Na_{0.030}Ca_{0.026})_{\Sigma=0.870}(U_{0.407}Ce_{0.101}Y_{0.205}Mn_{0.072})_{\Sigma=0.785}Fe^{3+}_{2.000}(Ti_{12.423}Fe^{3+}_{3.345}Cr_{1.624}V^{5+}_{0.129}Al_{0.032}Sn_{0.013}Nb_{0.007})_{\Sigma=17.573}O_{38}$. (2) Monte Arsiccio mine, Apuan Alps, Tuscany, Italy; electron microprobe analysis; corresponding to $(Sr_{0.312}Pb_{0.248}Na_{0.019}Ca_{0.014}La_{0.009})_{\Sigma=0.602}(U_{0.858}Y_{0.070}Ce_{0.021}Mn_{0.005})_{\Sigma=0.954}(Fe^{3+}_{1.695}Zn_{0.305})_{\Sigma=2.000}(Ti_{12.070}Fe^{3+}_{4.987}V^{5+}_{0.372}Al_{0.030}Nb_{0.030}Cr_{0.015}Sn_{0.001})_{\Sigma=17.505}O_{38}$.

**Mineral Group**: Crichtonite group.

**Occurrence**: In hydrothermal veins cutting schist and dolostone.

**Association:** Derbylite sphalerite, quartz (Monte Arsiccio mine); allanite-(Ce), anatase, destinezite, gypsum, monazite-(Ce), pyrite, rutile, "tourmaline" (Buca della Vena mine).

**Distribution**: At the Buca della Vena and Monte Arsiccio mines, Apuan Alps, Tuscany, Italy.

**Name**: An acronym from the surnames of the discoverers of the first specimens, Riccardo *MA*zzanti (b. 1953), Luigi *PI*erotti (b. 1953), Ugo *QUI*lici (b. 1946), and Moreno *RO*mani (b. 1949).

**Type Material**: National History Museum, University of Pisa, Italy (18837, 19650).

**References**: (1) Biagioni, C., P. Orlandi, M. Pasero, F. Nestola and L. Bindi (2014) Mapiquiroite, $(Sr,Pb)(U,Y)Fe_2(Ti,Fe^{3+})_{18}O_{38}$, a new member of the crichtonite group from the Apuan Alps, Tuscany, Italy. Eur. J. Mineral., 26, 427-437. (2) (2016) Amer. Mineral., 101, 750 (abs. ref. 1).