Hydroxycalciopyrochlore  
(Ca,Na,U,□)₂(Nb,Ti)₂O₆(OH)

Crystal Data:  Isometric.  
Point Group: 4/m 3 2/m.  As octahedral crystals, to 1 mm; also in combination with dodecahedra and tetrahexahedra.

Hardness = 5-6  VHN = 572  D(meas.) = 5.10(3)  D(calc.) = 5.15

Optical Class: Isotropic.  n(calc.) = > 1.9


Cell Data:  Space Group: Fd3 m.  a = 10.381(4)  Z = 8

X-ray Powder Pattern:  Maoniuping mine, Sichuan Province, China.  [After heating.]  
2.966 (100), 1.814 (34), 1.546 (21), 2.569 (18), 1.480 (5), 1.2815 (5), 1.1776 (5)

Chemistry:  
(1)  
\[ \text{Nb}_2\text{O}_5 \] 36.36  \[ \text{CaO} \] 9.89  
\[ \text{Ta}_2\text{O}_5 \] 1.78  \[ \text{FeO} \] 0.42  
\[ \text{TiO}_2 \] 15.23  \[ \text{MgO} \] 0.08  
\[ \text{Al}_2\text{O}_3 \] 0.15  \[ \text{Na}_2\text{O} \] 4.25  
\[ \text{Ce}_2\text{O}_3 \] 2.02  \[ \text{F} \] 0.38  
\[ \text{Y}_2\text{O}_3 \] 0.13  \[ \text{H}_2\text{O} \] [2.15]  
\[ \text{UO}_2 \] 25.87  \[ \text{O} + \text{F}_2 \] 0.16  
\[ \text{ThO}_2 \] 0.26  Total 98.92  
\[ \text{PbO} \] 0.11

(1) Maoniuping mine, Sichuan Province, China; average of 10 electron microprobe analyses, H₂O from stoichiometry and confirmed by Raman spectroscopy; corresponding to  
\[ (\text{Ca}_{0.74}\text{Na}_{0.58}\text{U}_{0.40}\text{Ce}_{0.05}\text{Fe}_{0.02}(\square_{0.21})_{2-2.00}(\text{Nb}_{1.15}\text{Ti}_{0.86}\text{Ta}_{0.03}\text{Al}_{0.01}\text{Mg}_{0.01})_{2-2.00}\text{O}_{6.02}[(\text{OH})_{1.01}\text{F}_{0.09}]_{2-1.10}. \]

Mineral Group: Pyrochlore supergroup, pyrochlore group.

Occurrence:  In a rare-earth deposit in an alkali feldspar granite.

Association: Calcite, barite, celestine, albite, aegirine, aegirine-augite, fluorite, parasite-(Ce), thorite, thorianite, zircon, galena, sphalerite, magnetite, pyrite.

Distribution:  At the Maoniuping mine, Mianning County, Xichang prefecture, Sichuan Province, southwest People’s Republic of China.

Name:  For a member of the pyrochlore group with dominant hydroxol in the Y structural site and calcium in the A structural site.

Type Material:  At the Geological Museum of China, Beijing, P.R. China (M11800).