**Piretite** $\mathbf{Ca(UO_2)_3(Se^{4+}O_3)_2(OH)_4 \cdot 4H_2O}$



**Crystal Data:** Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. Crystals are tabular on {001}, to acicular, striated parallel to elongation, exhibiting an irregular outline with {100}, {010}, {001}, may be hollow, to 5 mm; in stacked and curved aggregates.

**Physical Properties:** *Cleavage:* On {001}, good. *Fracture:* Uneven. *Tenacity:* "Weak". Hardness = 2.5 D(meas.) = 4.00 D(calc.) = 3.87 Radioactive.

**Optical Properties:** Transparent to translucent. *Color:* Lemon-yellow. *Luster:* Pearly. *Optical Class:* Biaxial (–). *Orientation:* $X = c$; $Y = a$; $Z = b$. *Dispersion:* $r > v$, weak. $\alpha = [1.54]$ $\beta = 1.73(1)$ $\gamma = 1.75(1)$ 2V(meas.) = 33(5)°

**Cell Data:** *Space Group:* $Pmnm$ or $Pmn2_1$. $a = 7.010(3)$ $b = 17.135(7)$ $c = 17.606(4)$ Z = 4

**X-ray Powder Pattern:** Shinkolobwe, Congo.
3.50 (100), 3.033 (100), 8.80 (80), 3.095 (50), 8.57 (40), 1.924 (40), 4.29 (30)

**Chemistry:**

| | (1) | (2) |
|---|---|---|
| $UO_3$ | 72.0 | 68.96 |
| $SeO_2$ | 19.3 | 17.84 |
| CaO | 3.57 | 4.51 |
| $H_2O$ | 8.00 | 8.69 |
| Total | 102.9 | 100.00 |

(1) Shinkolobwe, Congo; by electron microprobe, average of five analyses, $H_2O$ by TGA, IR confirms the presence of $(UO_2)^{2+}$, $(SeO_3)^{2-}$, $H_2O$; corresponds to $Ca_{0.76}(UO_2)_{3.02}(SeO_3)_{2.09}(OH)_{3.38} \cdot 3.64H_2O$. (2) $Ca(UO_2)_3(SeO_3)_2(OH)_4 \cdot 4H_2O$.

**Occurrence:** A rare secondary mineral in the oxidized zone of a uranium deposit in limestone.

**Association:** Uraninite.

**Distribution:** From Shinkolobwe, Katanga Province, Congo (Shaba Province, Zaire).

**Name:** To honor Professor Paul Piret (1932–1999), crystallographer, Catholic University of Louvain, Louvain, Belgium, who described numerous new mineral species.

**Type Material:** Royal Belgian Institute of Natural Sciences, Brussels, Belgium, RC 4717.

**References:** (1) Vochten, R., N. Blaton, O. Peeters, and M. Deliens (1996) Piretite, $Ca(UO_2)_3(SeO_3)_2(OH)_4 \cdot 4H_2O$, a new calcium uranyl selenite from Shinkolobwe, Shaba, Zaire. Can. Mineral., 34, 1315–1322. (2) (1997) Amer. Mineral., 82, 1040 (abs. ref. 1).