

Crystal Data: Triclinic, pseudohexagonal. *Point Group:* $\bar{1}$. As platy crystals, flattened on {001}, displaying {010}, {110}, and {110}, to 0.1 mm, in lamellar aggregates || {001}, on needles of uranophane. *Twinning:* Common on a plane or planes in the [001] zone, to give pseudohexagonal outlines.

Physical Properties: *Cleavage:* {001}, perfect; another \perp to the first. Hardness = n.d. VHN = 113 D(meas.) = n.d. D(calc.) = 6.194 Radioactive.

Optical Properties: Opaque to translucent. *Color:* Black, olive-brown; brown in transmitted light. *Luster:* Adamantine.

Optical Class: Biaxial (-). *Pleochroism:* X = pale brown to colorless; Y = Z = dull brown.

Orientation: X = c*; Y \wedge [110] = 85°; Z \wedge [110] = 5°. $\alpha = \sim 1.9$ $\beta = \sim 2.0$ $\gamma = \sim 2.0$
2V(meas.) = Very large.

Cell Data: *Space Group:* $P\bar{1}$. $a = 12.0919(2)$ $b = 16.3364(4)$ $c = 20.2881(4)$ $\alpha = 68.800(2)^\circ$
 $\beta = 78.6794(18)^\circ$ $\gamma = 76.1181(19)^\circ$ Z = 2

X-ray Powder Pattern: Shinkolobwe, D.R. Congo.

3.122 (100), 7.12 (80), 3.55 (60), 3.47 (60), 2.486 (40), 1.961 (40), 2.008 (30)

Chemistry:	(1)	(2)
UO ₃	78.28	79.48
PbO	16.38	15.51
H ₂ O	[5.34]	5.01
Total	100.00	100.00

(1) Shinkolobwe, D.R. Congo; average of eight electron microprobe analyses, H₂O by difference; corresponds to Pb_{1.07}U_{3.98}O₁₃•4.31H₂O. (2) PbU₆O₁₃•4H₂O. (3) Structural formula from reference 5, no analysis given; (Fe²⁺_{0.31}Mg_{0.19})Pb_{4.86}[U⁵⁺(U⁶⁺O₂)₁₇O₁₈(OH)₁₄](H₂O)_{-19.5}.

Occurrence: A very rare secondary mineral in the oxidized zone of a hydrothermal uranium deposit (Shinkolobwe, D.R. Congo).

Association: Uraninite, uranophane, becquerelite, masuyite, torbernite, kasolite, rutherfordine, wölsendorfite (Shinkolobwe, D.R. Congo); metazeunerite, nováčekite, zeunerite, antlerite, langite (Jáchymov, Czech Republic).

Distribution: From Shinkolobwe, Katanga Province, Democratic Republic of Congo (Shaba Province, Zaire). At Jáchymov (Joachimsthal), Czech Republic.

Name: Honors Emile Richet (1884-1939), Belgian geologist, formerly Chief Geologist, Union Minière du Haut-Katanga.

Type Material: University of Liège, Liège, Belgium (1712).

References: (1) Vaes, J.F. (1947) Six nouveaux minéraux d'urane provenant de Shinkolobwe (Katanga). Ann. Soc. Géol. Belg., 70, B212-B229, esp. B221-B223 (in French). (2) (1948) Amer. Mineral., 33, 384 (abs. ref. 1). (3) Frondel, C. (1958) Systematic mineralogy of uranium and thorium. U.S. Geol. Sur. Bull. 1064, 91-92. (4) Piret, P. and M. Deliens (1984) Nouvelles données sur la richetite PbO.4UO₃.4H₂O. Bull. Minéral., 107, 581-585 (in French with English abs.). (5) Plášil, J. (2017) Crystal structure of richetite revisited: Crystallographic evidence for the presence of pentavalent uranium. Amer. Mineral., 102, 1771-1775.