

Protasite**Ba(UO₂)₃O₃(OH)₂•3H₂O**

©2001-2005 Mineral Data Publishing, version 1

Crystal Data: Monoclinic. *Point Group:* *m*. As thin pseudo-hexagonal platelets, flattened on {010}, to 0.5 mm; spherulitic, massive. *Twinning:* By 60° rotation about [010], yielding sector twinning, universal.

Physical Properties: *Cleavage:* Good on {010}. *Fracture:* Hackly. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = 5.39(5) D(calc.) = 5.827(3) Radioactive.

Optical Properties: Transparent. *Color:* Bright orange. *Luster:* Subadamantine. *Optical Class:* Biaxial (-). $\alpha = 1.78$ $\beta = 1.80-1.83$ $\gamma = 1.82-1.83$ $2V(\text{meas.}) = 60^\circ-81^\circ$

Cell Data: *Space Group:* *Pn*. $a = 12.2949(16)$ $b = 7.2206(10)$ $c = 6.9558(8)$
 $\beta = 90.401(15)^\circ$ $Z = 2$

X-ray Powder Pattern: Shinkolobwe, Congo.
3.14 (100), 7.06 (50), 3.58 (35), 3.11 (35), 2.496 (35), 2.395 (25), 1.976 (25)

Chemistry:	(1)	(2)	(3)
UO ₃	78.0	78.22	79.20
SiO ₂		0.32	
PbO		2.63	
CaO		0.67	
BaO	15.0	9.48	14.15
K ₂ O		0.39	
H ₂ O	[7.0]	[8.29]	6.65
Total	[100.0]	[100.00]	100.00

(1) Shinkolobwe, Congo; by electron microprobe, H₂O by difference, presence confirmed by crystal-structure analysis; corresponding to Ba_{1.08}(UO₂)_{3.00}O₃(OH)₂•2.27H₂O. (2) Russia; by electron microprobe, corresponding to (Ba_{0.70}Ca_{0.13}Pb_{0.13}K_{0.04})_{Σ=1.00}•(UO₂)₃O₃(OH)₂•3H₂O. (3) Ba(UO₂)₃O₃(OH)₂•3H₂O.

Occurrence: In the oxidized zone of uranium-bearing mineral deposits.

Association: Uraninite, uranophane (Shinkolobwe, Congo); bauranoite, metacalcioiranoite (Russia).

Distribution: From Shinkolobwe, Katanga Province, Congo (Shaba Province, Zaire). At an undisclosed locality [Strel'tsovskoe U-Mo deposit, eastern Transbaikal] in Russia.

Name: To honor Professor Jean Protas (1932–), French mineralogist, University of Nancy, Nancy, France, who first synthesized the compound, and for his work with uranium oxide minerals.

Type Material: National Museum of Natural History, Washington, D.C., USA, 150732.

References: (1) Pagoaga, M.K., D.E. Appleman, and J.M. Stewart (1986) A new barium uranyl oxide hydrate mineral, protasite. *Mineral. Mag.*, 50, 125–128. (2) (1987) *Amer. Mineral.*, 72, 224 (abs. ref. 1). (3) Pagoaga, M.K., D.E. Appleman, and J.M. Stewart (1987) Crystal structures and crystal chemistry of the uranyl oxide hydrates becquerelite, bilietite, and protasite. *Amer. Mineral.*, 72, 1230–1238. (4) Belova, L.N. and V.P. Rogova (1988) First protasite find in the USSR. *Doklady Acad. Nauk SSSR*, 303, 1200–1202 (in Russian).