

**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . Crystals uncommon, typically cubes modified by the octahedron and dodecahedron, to 11 cm; botryoidal to reniform, colloform banded, columnar, dense massive; may be dendritic. *Twining:* On {111}, rare.

**Physical Properties:** *Fracture:* Uneven to conchoidal. *Tenacity:* Brittle. Hardness = 5–6 VHN = 499–548 (50 g load). D(meas.) = 10.63–10.95, decreasing markedly with oxidation, to as low as 6.5. D(calc.) = 10.88 Radioactive.

**Optical Properties:** Opaque, transparent in thinnest fragments. *Color:* Steel-black to velvet-black, brownish black, pale gray, pale green; in transmitted light, pale green, pale yellow, deep brown; pale gray with brownish tint in reflected light, may show dark brown internal reflections. *Streak:* Brownish black, gray, olive-green, shining. *Luster:* Submetallic to greasy, dull.

*Optical Class:* Isotropic.

R: (400) 17.6, (420) 17.3, (440) 17.0, (460) 16.8, (480) 16.5, (500) 16.3, (520) 16.2, (540) 16.0, (560) 15.9, (580) 15.8, (600) 15.9, (620) 15.9, (640) 16.0, (660) 16.0, (680) 16.1, (700) 16.2

**Cell Data:** *Space Group:*  $Fm\bar{3}m$  (synthetic UO<sub>2.03</sub>).  $a = 5.4682$   $Z = 4$

**X-ray Powder Pattern:** Synthetic UO<sub>2.03</sub>; may be confused with thorianite or cerianite. 3.157 (100), 1.934 (49), 2.735 (48), 1.649 (47), 1.255 (18), 1.223 (15), 1.0523 (15)

<b>Chemistry:</b>	(1)	(2)		(1)	(2)
UO <sub>3</sub>	22.69	20.1	Al <sub>2</sub> O <sub>3</sub>	0.25	
ThO <sub>2</sub>	0.20	14.3	Fe <sub>2</sub> O <sub>3</sub>	0.10	
CeO <sub>2</sub>	0.71		FeO		0.1
UO <sub>2</sub>	70.09	50.0	PbO	0.40	13.9
(Y, Er) <sub>2</sub> O <sub>3</sub>	3.41	0.0	CaO	0.30	0.1
La <sub>2</sub> O <sub>3</sub>	1.02	0.1	H <sub>2</sub> O	[0.41]	
Ce <sub>2</sub> O <sub>3</sub>		0.8	rem.	0.12	
			Total	[99.70]	[99.4]

(1) Placer de Guadalupe, Chihuahua, Mexico; average of two analyses, H<sub>2</sub>O calculated from gain in weight on ignition. (2) Locality not stated; by electron microprobe; U<sup>4+</sup>:U<sup>6+</sup> from stoichiometry, original total given as 100.4%; corresponding to (U<sub>0.48</sub><sup>4+</sup>U<sub>0.18</sub><sup>6+</sup>Pb<sub>0.16</sub>Th<sub>0.15</sub>Ca<sub>0.01</sub>Ce<sub>0.01</sub>)<sub>Σ=0.99</sub>O<sub>2.01</sub>.

**Mineral Group:** Forms a series with thorianite.

**Occurrence:** In granite and syenite pegmatites; in hydrothermal high-temperature tin and moderate-temperature Co–Ni–Bi–Ag–As and other sulfide veins; in Colorado Plateau-type sandstone-hosted U–V deposits; in uraniferous conglomerates; a detrital mineral.

**Association:** Zircon, monazite, tourmaline, mica, feldspar (pegmatitic); pyrite, chalcopyrite, galena, bismuth, silver, nickeline, barite, fluorite, carbonates (Co–Bi–Ag hydrothermal veins).

**Distribution:** Widespread; may form an important ore. At Jáchymov (Joachimsthal) and Horní Slavkov (Schlaggenwald), Czech Republic. In Germany, from Johanngeorgenstadt, Schneeberg, and Annaberg, Saxony; in Bavaria, from Wölsendorf and Hagendorf. From many mines in Cornwall, England. Large crystals from the Sierra Albarrana, Córdoba Province, Spain. At Wilberforce, Ontario, and Great Bear Lake, Northwest Territories, Canada. In the USA, from Branchville, Fairfield Co., Connecticut; Grafton, Grafton Co., New Hampshire; fine crystals from Standpipe Hill, Topsham, Sagadahoc Co., Maine; around Spruce Pine, Mitchell Co., North Carolina; in the Ingersoll mine, near Keystone, Pennington Co., South Dakota. From Shinkolobwe All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.

and Kalongwe, Katanga Province, Congo (Shaba Province, Zaire). At Morogoro, Uruguru Mountains, Tanzania.

**Name:** For URANIUM in the composition.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 611–620. (2) Grandstaff, D.E. (1976) A kinetic study of the dissolution of uraninite. *Econ. Geol.*, 71, 1493–1506. (3) Janeczek, J. and R.C. Ewing (1992) Structural formula of uraninite. *J. Nuclear Materials*, 190, 128–132. (4) (1953) NBS Circ. 539, 2, 33.