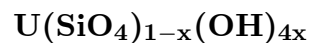


Coffinite



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Crystal Data: Tetragonal; may be metamict. *Point Group:* $4/m\ 2/m\ 2/m$. As crystals, rarely $> 20\ \mu\text{m}$, and in colloform to botryoidal incrustations, radially fibrous. Commonly pulverulent, in aggregates of extremely fine crystallites, or massive.

Physical Properties: *Fracture:* Irregular to subconchoidal, earthy. *Tenacity:* Brittle or friable. Hardness = 5–6 $D(\text{meas.}) = 5.1$ $D(\text{calc.}) = \text{n.d.}$ Radioactive.

Optical Properties: Opaque, transparent on very thin edges. *Color:* Black from included organic matter; pale brown to dark brown in thin section. *Luster:* Dull to adamantine. *Optical Class:* Isotropic due to fine grain size; uniaxial (+) or (-). *Pleochroism:* Moderate; pale yellow-brown \parallel length, medium brown \perp length. $n = 1.73\text{--}1.75$

Cell Data: *Space Group:* $I4_1/amd$ (synthetic USiO_4). $a = 6.979$ $c = 6.252$ $Z = 4$

X-ray Powder Pattern: Synthetic USiO_4 ; natural material gives broad peaks or may be metamict.

3.48 (100), 4.64 (95), 2.636 (95), 1.803 (70), 2.789 (45), 1.849 (35), 1.738 (35)

Chemistry:

	(1)	(2)	(3)
SiO_2	5.20	18.20	16.41
UO_2	68.29	81.80	73.75
Al_2O_3	3.87		
Fe_2O_3	1.24		
As_2O_5	4.35		
V_2O_5	2.85		
Pb	0.12		
H_2O	[8.49]		9.84
Total	[94.41]	100.00	100.00

(1) La Sal No. 2 mine, Colorado, USA; H_2O from loss on ignition, contains admixed clay minerals, vanadates, organic matter, etc. (2) USiO_4 . (3) $\text{USiO}_4 \cdot 2\text{H}_2\text{O}$.

Occurrence: In Colorado Plateau-type black unoxidized U–V deposits, replacing organic material in sandstone; in other sedimentary and hydrothermal vein uranium deposits.

Association: Uraninite, thorite, pyrite, marcasite, roscoelite, clay minerals, amorphous organic matter.

Distribution: Numerous minor occurrences; those mentioned are for well-crystallized or studied material. In the USA, in the La Sal No. 2 mine, Beaver Mesa, Gateway district, Mesa Co., and in the Peanut mine, Montrose Co., Colorado; around the Jackpile and Crownpoint mines, Valencia Co., New Mexico; in the Mi Vida, Homestake, and other mines, San Juan Co., Utah. From Wölsendorf, Bavaria; at Niederramstadt, near Schneeberg, Johannegeorgenstadt, and Niederpfannenstiel, Saxony, Germany. At Hüttenberg, Carinthia, Austria. From Jáchymov (Jochimsthal) and Příbram, Czech Republic. In the Geevor mine, St. Just, the South Terras mine, St. Stephen-in-Brannel, and the Roskrow United mine, Ponsansooth, Cornwall, England.

Name: Honoring Reuben Clare Coffin (1886–1972), Tulsa, Oklahoma, USA, pioneer geologist in the study of uranium deposits of the Colorado Plateau.

Type Material: The Natural History Museum, London, England, 1956,201; National Museum of Natural History, Washington, D.C., USA, 112646.

References: (1) Stieff, L.R., T.W. Stern, and A.M. Sherwood (1956) Coffinite, a uranous silicate with hydroxyl substitution: a new mineral. *Amer. Mineral.*, 41, 675–688. (2) Fuchs, 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.

L.H. and E. Gebert (1958) X-ray studies of synthetic coffinite, thorite and uranothorites. Amer. Mineral., 43, 243–248. (3) Dubinchuk, V.T., I.S. Naumova, I.Y. Kravtsova, and G.A. Sidorenko (1981) Determination of the crystal structure of naturally occurring coffinite. Mineral. Zhurnal, 3(4), 81–85 (in Russian with English abs.). (4) (1982) Mineral. Abs., 33, 222 (abs. ref. 3). (5) Hansley, P.A. and J.L. Fitzpatrick (1989) Compositional and crystallographic data on REE-bearing coffinite from the Grants uranium region, northwestern New Mexico. Amer. Mineral., 74, 263–270.