Coffinite

\[ \text{U(SiO}_4\text{)}_{1-x} \text{(OH)}_{4x} \]

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


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 || length, medium brown ⊥ length. \( n = 1.73–1.75 \)

Cell Data: Space Group: \( I4_1/amd \) (synthetic USiO\(_4\)).

\[
\begin{array}{ccc}
   a & = 6.979 & c = 6.252 & Z = 4 \\
\end{array}
\]

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:

\[
\begin{array}{ccc}
   \text{SiO}_2 & 5.20 & 18.20 & 16.41 \\
   \text{UO}_2 & 68.29 & 81.80 & 73.75 \\
   \text{Al}_2\text{O}_3 & 3.87 & & \\
   \text{Fe}_2\text{O}_3 & 1.24 & & \\
   \text{As}_2\text{O}_5 & 4.35 & & \\
   \text{V}_2\text{O}_5 & 2.85 & & \\
   \text{Pb} & 0.12 & & \\
   \text{H}_2\text{O} & [8.49] & 9.84 & \\
   \text{Total} & [94.41] & 100.00 & 100.00 \\
\end{array}
\]

(1) La Sal No. 2 mine, Colorado, USA; \( \text{H}_2\text{O} \) from loss on ignition, contains admixed clay minerals, vanadates, organic matter, etc. (2) USiO\(_4\). (3) 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, Johanngeorgenstadt, and Niederpfannenstiel, Saxony, Germany. At Hüttenberg, Carinthia, Austria. From Jáchymov (Joachimsthal) and Pribram, Czech Republic. In the Geevor mine, St. Just, the South Terras mine, St. Stephen-in-Brannel, and the Roskrow United mine, Ponsanooth, Cornwall, England.

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


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.