



>>Entry Name: Uranium(IV) oxide (UO₂)

Synonym(s): Uranium dioxide

CAS Registry Number: 1344-57-6

Related CAS Registry Numbers(s): 11113-93-2 12068-96-1 18378-88-6 84142-24-5 84142-25-6

UO₂

Molecular Formula: O₂U

Molecular Weight: 270.028

Accurate Mass: 270.040614

Percentage Composition: O 11.85%; U 88.15%

Source/Synthesis: Obt. by redn. of higher oxides at *ca.* 1000°

Use/Importance: Reactor fuel

Physical Description: Brown to black solid

Melting Point: Mp 2875°

Other Data: Paramagnetic; $\mu_{\text{eff}} = 1.8\mu_{\text{B}}$ (< 30.8K). On heating in air, turns into U₃O₈

>>Variant: Mineral-form

Synonym(s): Uraninite

CAS Registry Number: 1317-99-3

Extra CAS Registry Numbers(s): 1317-75-5

Molecular Formula: O₂U

Molecular Weight: 270.028

Accurate Mass: 270.040614

Percentage Composition: O 11.85%; U 88.15%

Source/Synthesis: Widespread occurrence

Use/Importance: Principal uranium ore

Physical Description: Cubic cryst. Colour variable, may be steel black, brown-black, grey, green

>>Derivative: U₄O₉

>>Derivative: U₂O₅

>>Derivative: U₃O₈

>>Derivative: UO₃

References:

Frazer, B.C. *et al.*, *Phys. Rev.*, 1965, **140**, 1448, (*magnetism*)

Rahman, H.U. *et al.*, *J. Phys. Chem. Solids*, 1966, **27**, 1833, (*magnetism*)

Rouse, K.D. *et al.*, *Acta Cryst. B*, 1968, **24**, 117, (*cryst struct*)

Muxart, R. *et al.*, *Actinides Rev.*, 1969, **1**, 223

Winslow, G.H., *High Temp. Sci.*, 1971, **3**, 361, (*struct*)

Compr. Inorg. Chem., Pergamon, Oxford, 1973, **5**, 224, (*rev*)

Fahey, J.A. *et al.*, *Inorg. Nucl. Chem. Lett.*, 1974, **10**, 459

Brauer, G., *Handbuch Prap. Anorg. Chem.*, 3rd edn., Ferdinand Enke Verlag, 1975, **2**, 1228, (*synth*)

Gmelin Handbook Inorg. Chem., Syst. No. 55, Suppl., 1984, **C4**; *Suppl.*, 1986, **C5**, 1228, (*rev*)

Lewis, R.J., *Sax's Dangerous Properties of Industrial Materials*, 8th edn., Van Nostrand Reinhold, 1992, UPJ000