Wölsendorfite $Pb_7(UO_2)_{14}O_{19}(OH)_4 \cdot 12H_2O$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. As spherulites and incrustations.

Physical Properties: *Cleavage*: {001}, good. Hardness = n.d. D(meas.) = 6.8(1) D(calc.) = 6.888 Radioactive.

Optical Properties: Semitransparent. *Color*: Red-orange to carmine-red.
Optical Class: Biaxial. α = 2.05(3) β = n.d. γ = 2.09(1) 2V(meas.) = n.d.

Cell Data: *Space Group*: *Cmcm*. a = 14.131(1) b = 13.885(1) c = 55.969(4) Z = 8

X-ray Powder Pattern: Shinkolobwe, Congo.
3.09 (100), 3.44 (90b), 1.907 (60), 6.90 (40), 2.734 (30), 2.010 (30), 1.734 (30)

Chemistry:

	(1)	(2)
UO_3	69.80	69.05
SiO_2		0.32
Al_2O_3		0.10
FeO		0.39
PbO	23.14	22.50
CaO	1.24	0.09
BaO		3.27
K_2O		0.10
H_2O	4.30	[4.18]
insol.	0.48	.
Total	98.96	[100.00]

(1) Wölsendorf, Germany; corresponds to $(Pb_{0.85}Ca_{0.18})_{\Sigma=1.03}U_{2.00}O_{7.14} \cdot 1.96H_2O$. (2) Randboldal, Greenland; by electron microprobe, H_2O by difference; corresponds to $(Pb_{0.81}Ba_{0.17}Fe_{0.04}K_{0.02}Ca_{0.01})_{\Sigma=1.05}(U_{1.95}Si_{0.04}Al_{0.02})_{\Sigma=2.01}O_{7.00} \cdot 2H_2O$.

Occurrence: A rare alteration product of uraninite in the oxide zone of U-bearing mineral deposits.

Association: Uraninite, rutherfordine, becquerelite, masuyite, kasolite, metastudtite (Shinkolobwe).

Distribution: From Wölsendorf, Bavaria, Germany. At Kerségalec, near Lignol, Morbihan, France. In the Val Rendena, Trentino-Alto Adige, Italy. From Shinkolobwe, Katanga Province, Congo (Shaba Province, Zaire). At Okla, near Franceville, Gabon. From Great Bear Lake, Northwest Territories, Canada. In the Williams quarry, near Easton, Northampton Co., Pennsylvania; at Branchville, Fairfield Co., Connecticut; and on the Hell Hole claims, Wheeler Basin, Grand Co., Colorado, USA. At Randboldal, northeastern Greenland. In the Córrego do Urucum pegmatite, near Galiléia, Minas Gerais, Brazil. From the Koongarra deposit, 225 km east of Darwin, Northern Territory, Australia.

Name: For the mineral's first-noted occurrence at *Wölsendorf*, Germany.

Type Material: National School of Mines, Paris, France.

References: (1) Protas, J. (1957) La wölsendorfite, nouvelle espèce uranifère. Compt. Rendus Acad. Sci. Paris, 244, 2942-2944 (in French). (2) (1957) Amer. Mineral., 42, 919 (abs. ref. 1).
(3) Toussaint, J. (1961) Sur la structure de la wölsendorfite de Shinkolobwe. Ann. Soc. Géol. Belg., 84, 365-373 (in French). (4) Deliens, M. (1977) Review of the hydrated oxides of U and Pb, with new X-ray powder data. Mineral. Mag., 41, 51-57. (5) Beddoe-Stephens, B. and K. Secher (1982) Barian wölsendorfite from East Greenland. Mineral. Mag., 46, 130-132. (6) Burns, P.C. (1999) A new complex sheet of uranyl polyhedra in the structure of wölsendorfite. Amer. Mineral., 84, 1661-1673.