Cliffordite $(UO_2)Te_3^{4+}O_7$

Crystal Data: Cubic. *Point Group:* $2/m\ \overline{3}$. As octahedra, to 0.2 mm, in crusts.

Physical Properties: Hardness = 4 D(meas.) = 6.57 (synthetic). D(calc.) = 6.77 Radioactive.

Optical Properties: Semitransparent. *Color:* Bright sulfur-yellow. *Luster:* Adamantine. *Optical Class:* Isotropic. $n = 2.25(2)$ (synthetic).

Cell Data: *Space Group:* $Pa3$. a = 11.37–11.47 Z = 8

X-ray Powder Pattern: San Miguel prospect, Mexico.
3.273 (10), 2.844 (8), 2.007 (8), 2.755 (7), 1.712 (7), 4.63 (6), 4.02 (6)

Chemistry:

	(1)	(2)
U	24.	31.12
Te	54.	50.05
O		18.83
Total		100.00

(1) San Miguel prospect, Mexico; by electron microprobe. (2) $(UO_2)Te_3O_7$.

Occurrence: As rare incrustations along fractures in the oxidized zone of hydrothermal Au–Ag telluride deposits.

Association: Mackayite, barite, quartz, "limonite" (San Miguel prospect, Mexico); tellurium, paratellurite, quartz (Moctezuma mine, Mexico).

Distribution: From the San Miguel prospect, and 10 km southeast at the Moctezuma (Bambolla) mine, 12 km south of Moctezuma, Sonora, Mexico.

Name: Honors Professor Clifford Frondel (1907–2002), Harvard University, Cambridge, Massachusetts, USA, for his contributions to uranium mineralogy.

Type Material: Natural History Museum, Paris, France, 175.83, 180.61; Harvard University, Cambridge, Massachusetts, 119079; National Museum of Natural History, Washington, D.C., USA, 120246, 164341, 164342.

References: (1) Gaines, R.V. (1969) Cliffordite - a new tellurite mineral from Moctezuma, Sonora, Mexico. Amer. Mineral., 54, 697–701. (2) Brandstaetter, F. (1981) Non-stoichiometric, hydrothermally synthesized cliffordite. Tschermaks Mineral. Petrog. Mitt., 29, 1–8.