Fontanite $Ca(UO_2)_3(CO_3)_2O_2{\cdot}6H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As rectangular crystals, bladed on {010} and elongated along [001] to 1.2 mm; in divergent sprays.

Physical Properties: *Cleavage*: Good on {100}, {010}, and {001}. Hardness = 3 D(meas.) = 4.10 D(calc.) = 3.984 Radioactive; pale green fluorescence under LW UV.

Optical Properties: Transparent. *Color*: Bright yellow. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α = [1.603] β = 1.690(2) γ = 1.710(3) 2V(meas.) = 49(2)° *Orientation*: $X = b$; $Y = a$; $Z = c$. *Dispersion*: $r < v$, weak.

Cell Data: *Space Group*: $P2_1/n$. a = 6.968(3) b = 17.276(7) c = 15.377(6) β = 90.064(6)° Z = 4

X-ray Powder Pattern: Rabéjac deposit, France.
8.55 (100), 2.772 (70), 4.11 (60), 3.723 (60), 6.94 (50), 3.460 (50), 3.211 (40)

Chemistry:

	(1)	(2)
CO_2	14.80	15.38
UO_3	76.14	75.00
CaO	4.15	4.90
H_2O	[4.91]	4.72
Total	[100.00]	100.00

(1) Rabéjac deposit, France; by electron microprobe, CO_2 by CHN analyzer, UO_3 and CaO averages of four analyses, H_2O by difference; corresponds to $Ca_{0.85}(UO_2)_{3.08}(CO_3)_{3.89}{\cdot}3.15H_2O$.
(2) $Ca(UO_2)_3(CO_3)_4{\cdot}3H_2O$.

Occurrence: A rare secondary mineral in the oxidized portions of a uranium deposit.

Association: Billietite, uranophane.

Distribution: From the Rabéjac uranium deposit, seven km south-southeast of Lodève, Hérault, France.

Name: Honors François *Fontan* (1942-2007), mineralogist specializing in phosphates, University Paul-Sabatier, Toulouse, France.

Type Material: Royal Belgian Institute of Natural Sciences, Brussels, Belgium (RC4216).

References: (1) Deliens, M. and P. Piret (1992) La fontanite, carbonate hydraté d'uranyle et de calcium, nouvelle espèce minérale de Rabejac, Hérault, France. Eur. J. Mineral., 4, 1271-1274 (in French with English abs.). (2) (1993) Amer. Mineral., 78, 846-847 (abs. ref. 1). (3) Hughes, K.-A. and P.C. Burns (2003) A new uranyl carbonate sheet in the crystal structure of fontanite, $Ca[(UO_2)_3(CO_3)_2O_2](H_2O)_6$. Amer. Mineral., 88, 962-966. (4) Colmenero, F., J. Plášil, and J. Sejkora (2020) The crystal structures and mechanical properties of the uranyl carbonate minerals roubaultite, fontanite, sharpite, widenmannite, grimselite and cejkaite. Inorganic Chemistry Frontiers, 7, 4197-4221.