Leydetite $Fe(UO_2)(SO_4)_2(H_2O)_{11}$

Crystal Data: Monoclinic. *Point Group*: 2/*m.* As tabular crystals, to 2 mm, displaying {001}, {010}, {100}, {101} and {011}; typically as intergrown aggregates. *Twinning*: Polysynthetic.

Physical Properties: *Cleavage*: Perfect on {001}. *Fracture*: n.d. *Tenacity*: Brittle. Hardness = ~ 2 D(meas.) = n.d. D(calc.) = 2.55 Dehydrates readily in dry air.

Optical Properties: Transparent to translucent. *Color*: Pale yellow to greenish, orange-yellow after dehydration; colorless in transmitted light. *Streak*: Yellowish white. *Luster*: Vitreous. *Optical Class*: Biaxial (+) [Probable.] $\alpha' = 1.513(2)$ $\gamma' = 1.522(2)$ 2V(calc.) = 83°

Cell Data: *Space Group*: *C*2/*c*. $a = 11.3202(3)$ $b = 7.7293(2)$ $c = 21.8145(8)$ $\beta = 102.402(3)°$ Z = 4

X-ray Powder Pattern: Mas d'Alary uranium deposit, Lodève, Hérault, France.
10.625 (100), 5.321 (66), 6.277 (42 calculated), 3.549 (5), 2.663 (4), 2.131 (2), 5.167 (1)

Chemistry:	(1)	(2)	(3)
FeO	10.88	9.28	10.03
CuO	0.16	0.14	
MgO	0.43	0.36	
Al_2O_3	0.31	0.26	
SiO_2	0.21	0.18	
SO_3	25.68	21.91	22.34
UO_3	47.10	40.19	39.98
H_2O	[32.65]	[27.67]	27.65
Total	117.40	100.00	100.00

(1) Mas d'Alary uranium deposit, Lodève, Hérault, France; average electron microprobe analysis, H_2O from structure analysis, complex anions confirmed by IR spectroscopy. (2) Analysis 1 normalized, corresponding to $(Fe_{0.93}Mg_{0.07}Al_{0.04}Cu_{0.01})_{\Sigma=1.05}(U_{1.01}O_2)(S_{1.96}Si_{0.02})_{\Sigma=1.98}O_8(H_2O)_{11}$. (3) $Fe(UO_2)(SO_4)_2(H_2O)_{11}$.

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

Association: Pyrite, uraninite, calcite, quartz, unspecified clay minerals, gypsum, deliensite.

Distribution: From the Mas d'Alary uranium deposit, Lodève, Hérault, France.

Name: Honors Jean-Claude Leydet (b.1961), an amateur mineralogist and mineral collector from Brest, France, who discovered the new mineral.

Type Material: At the Musée Cantonal de Géologie, Lausanne, Switzerland (MGL 92661).

References: (1) Plášil, J., A.V. Kasatkin, R. Škoda, M. Novák, A. Kallistová, M. Dušek, R. Skála, K. Fejfarová, J. Čejka, N. Meisser, H. Goethals, V. Machovič, and L. Lapčák (2013) Leydetite, $Fe(UO_2)(SO_4)_2(H_2O)_{11}$, a new uranyl sulfate mineral from Mas d'Alary, Lodève, France. Mineral. Mag., 77(4), 429-441. (2) (2015) Amer. Mineral., 100, 2355-2356 (abs. ref. 1).