

Deliensite**Fe²⁺(UO₂)₂(SO₄)₂(OH)₂•3H₂O**

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. As crystals, elongated along [001], tabular on {100}, to 0.35 mm; typically in spherical aggregates and in crusts.

Twinning: Observed on {010}, yielding a parting.

Physical Properties: *Cleavage:* On {100}, perfect; on {010}, a parting. *Tenacity:* "Weak".
Hardness = 2 D(meas.) = 3.268(7) D(calc.) = 3.31 Radioactive.

Optical Properties: Transparent to translucent. *Color:* Pale yellow to pale gray.

Streak: White. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Orientation:* $X = a$; $Y = b$; $Z = c$. *Dispersion:* $r > v$, weak.

$\alpha = [1.432]$ $\beta = 1.470(2)$ $\gamma = 1.492(2)$ $2V(\text{meas.}) = 73(2)^\circ$

Cell Data: *Space Group:* $Pn\bar{m}$ or $Pnn2$. $a = 15.908(5)$ $b = 16.274(3)$ $c = 6.903(1)$
 $Z = 4$

X-ray Powder Pattern: Mas-d'Alary deposit, France.

5.90 (100), 7.95 (81), 3.94 (71), 2.597 (70), 3.45 (67), 3.166 (50), 2.895 (41)

Chemistry:

	(1)	(2)
SO ₃	17.37	18.28
UO ₃	67.63	65.29
FeO	7.42	8.20
H ₂ O	8.63	8.23
Total	101.05	100.00

(1) Mas-d'Alary deposit, France; by electron microprobe, average of five analyses, H₂O by TGA; corresponds to Fe_{0.91}(UO₂)_{2.08}(SO₄)_{1.95}(OH)_{2.08}•3.18H₂O. (2) Fe(UO₂)₂(SO₄)₂(OH)₂•3H₂O.

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

Association: Uraninite, gypsum, pyrite.

Distribution: From the Mas-d'Alary uranium deposit, three km south-southeast of Lodève, Hérault, France.

Name: Honors Dr. Michel Deliens (1939–), Belgian mineralogist of the Royal Belgian Institute of Natural Sciences, Brussels, Belgium, for his contributions to uranium mineralogy.

Type Material: Royal Belgian Institute of Natural Sciences, Brussels, Belgium, RC4718.

References: (1) Vochten, R., N. Blaton, and O. Peeters (1997) Deliensite, Fe(UO₂)₂(SO₄)₂(OH)₂•3H₂O, a new ferrous uranyl sulfate hydroxyl hydrate from Mas d'Alary, Lodève, Hérault, France. *Can. Mineral.*, 35, 1021–1025. (2) (1998) *Amer. Mineral.*, 83, 653 (abs. ref. 1).