

Richellite

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Crystal Data: Amorphous or nearly so; tetragonal after heating. *Point Group:* n.d.
Radially fibrous globules, foliated or compact; typically massive, to 3 cm.

Physical Properties: Hardness = 2–3 D(meas.) = ~2 D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* Reddish to yellowish brown. *Streak:* Reddish to yellowish brown. *Luster:* Greasy to hornlike, subvitreous.

Optical Class: Isotropic. $n = \text{n.d.}$

Cell Data: *Space Group:* n.d. $a = 5.18$ $c = 12.61$ $Z = [1]$

X-ray Powder Pattern: Richelle, Belgium; after heating to 500 °C for 30 minutes.
3.24(9), 1.590 (7), 3.58 (6), 3.15 (6), 5.99 (5), 4.35 (5), 4.14 (5)

Chemistry:	(1)	(2)	(3)
P ₂ O ₅	25.49	36.75	38.24
Al ₂ O ₃	3.64	5.25	4.81
FeO			6.78
Fe ₂ O ₃	29.67	42.78	35.50
CaO	7.19	10.37	9.82
HF	0.96		
H ₂ O ⁺	23.63		
H ₂ O ⁻	9.47		
H ₂ O		[4.85]	4.85
Total	100.05	[100.00]	100.00

(1) Richelle, Belgium. (2) Analysis (1) recalculated to 100%, with (OH)¹⁻ by analogy to the lipscombite structure. (3) $(\text{Ca}_{1.3}\text{Fe}_{0.7})_{\Sigma=2.0}(\text{Fe}_{3.3}\text{Al}_{0.7})_{\Sigma=4.0}(\text{PO}_4)_{4.0}(\text{OH})_{2.0}$.

Occurrence: Presumably as a secondary mineral in phosphatic sedimentary rocks.

Association: Halloysite, allophane, koninckite (Richelle, Belgium).

Distribution: From Richelle, near Visé, Belgium. In the Gold Quarry mine, near Carlin, Maggie Creek district, Eureka Co., Nevada, USA.

Name: For the locality where first found, Richelle, Belgium.

Type Material: University of Liège, Liège, Belgium, 9361 and 9375.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 956–957. (2) McConnell, D. (1963) Thermocrystallization of richellite to produce a lazulite structure (calcium lipscombite). *Amer. Mineral.*, 48, 300–307. (3) Jensen, M.C., J.C. Rota, and E.E. Foord (1995) The Gold Quarry mine, Carlin Trend, Eureka County, Nevada. *Mineral. Record*, 26, 449–469, esp. 463.