

Fransoletite**Ca₃Be₂(PO₄)₂(PO₃OH)₂•4H₂O**

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Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals are arrow-head-shaped, curved, composed of mosaiced aggregates of minute crystallites, to 3 mm. Elongated along [101], tabular on {010}, forms are {100}, {011}, {010}.

Physical Properties: *Cleavage:* {010}, imperfect. *Fracture:* Irregular. Hardness = ~3
D(meas.) = 2.56(3) D(calc.) = 2.53

Optical Properties: Transparent to translucent. *Color:* Colorless to slightly whitish.
Streak: White. *Luster:* Subvitreous.

Optical Class: Biaxial (+). *Orientation:* Y = b; Z ∧ c = 14°. α = 1.560(2) β = 1.566(2)
γ = 1.586(2) 2V(meas.) = 25° 2V(calc.) = 25°

Cell Data: *Space Group:* P2₁/a. a = 7.3482(13) b = 15.0522(28) c = 7.0685(13)
β = 96.519(6)° Z = 2

X-ray Powder Pattern: Tip Top mine, South Dakota, USA.
3.044 (100), 3.47 (90), 3.32 (70), 2.317 (50), 7.52 (40), 2.597 (40), 6.55 (30)

Chemistry:	(1)	(2)
P ₂ O ₅	47.3	47.93
MnO	0.3	
BeO	9.3	8.45
CaO	28.8	28.41
H ₂ O	[14.3]	15.21
Total	[100.0]	100.00

(1) Tip Top mine, South Dakota, USA; by electron microprobe, Be by AA, H₂O by difference; corresponds to (Ca_{3.08}Mn_{0.02})_{Σ=3.10}Be_{2.23}(PO₄)₂(PO₃OH)₂•3.76H₂O.

(2) Ca₃Be₂(PO₄)₂(PO₃OH)₂•4H₂O.

Polymorphism & Series: Dimorphous with parafransoletite.

Occurrence: Formed by late-stage hydrothermal alteration of beryl and other phosphates in a zoned granite pegmatite.

Association: Beryl, tiptopite, whitlockite, carbonate-apatite, montgomeryite, hurlbutite, englishite, roscherite, quartz.

Distribution: From the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota, USA.

Name: To honor Dr. André-Mathieu Fransolet (1947-), Professor of Mineralogy, University of Liège, Liège, Belgium, for his work with primary phosphate minerals.

Type Material: National Museum of Natural History, Washington, D.C., USA, 149607.

References: (1) Peacor, D.R., P.J. Dunn, W.L. Roberts, T.J. Campbell, and D. Newbury (1983) Fransoletite, a new calcium beryllium phosphate from the Tip Top pegmatite, Custer, South Dakota. Bull. Minéral., 106, 499–503. (2) (1985) Amer. Mineral., 70, 215 (abs. ref. 1). (3) Kampf, A.R. (1992) Beryllophosphate chains in the structures of fransoletite, parafransoletite, and ehrleite and some general comments on beryllophosphate linkages. Amer. Mineral., 77, 848–856.