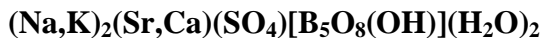


Fontarnauite

Crystal Data: Monoclinic. *Point Group:* 2/m. As prismatic pseudohexagonal crystals, clusters of crystals to 5 mm, or as branching aggregates.

Physical Properties: *Cleavage:* Perfect on {010}. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 2.5-3 D(meas.) = 2.37 D(calc.) = 2.533

Optical Properties: Transparent to translucent. *Color:* Colorless to light brown. *Streak:* White. *Luster:* Pearly.

Optical Class: Biaxial (-). $\alpha = 1.517(2)$ $\beta = 1.539(2)$ $\gamma = 1.543(2)$ $2V(\text{meas.}) = 46(1)^\circ$ $2V(\text{calc.}) = 46^\circ$ *Dispersion:* $r > v$, medium to weak. *Orientation:* $X \wedge a = 95.0^\circ$ (β obtuse); $Y \parallel b$, $Z \wedge c = 81.9^\circ$ (β acute).

Cell Data: *Space Group:* $P2_1/c$. $a = 6.458(2)$ $b = 22.299(7)$ $c = 8.571(2)$ $\beta = 103.047(13)^\circ$ $Z = 4$

X-ray Powder Pattern: Emet basin, near Doğanlar, Kütahya Province, Western Anatolia, Turkey. 11.150 (100), 3.339 (20), 3.199 (10), 3.046 (10), 2.750 (10), 3.395 (8), 2.400 (8)

Chemistry:	(1)	(2)
B ₂ O ₃	[30.77]	37.45
Na ₂ O	12.65	13.14
K ₂ O	1.70	
CaO	2.26	
SrO	18.98	22.30
SO ₃	17.75	17.23
<u>H₂O</u>	<u>10.01</u>	<u>9.69</u>
Total	102.01	100.00

(1) Emet basin, near Doğanlar, Kütahya Province, Western Anatolia, Turkey; average of 43 electron microprobe analyses supplemented by TG and DTA analysis, FTIR and Raman spectroscopy, H₂O and B₂O₃ calculated; corresponds to $(\text{Na}_{1.84}\text{K}_{0.16})_{\Sigma=2.00}(\text{Sr}_{0.82}\text{Ca}_{0.18})_{\Sigma=1.00}\text{S}_{1.00}\text{B}_5\text{H}_5\text{O}_{15}$.

(2) Na₂Sr(SO₄)[B₅O₈(OH)](H₂O)₂.

Occurrence: An early diagenetic phase in borate-bearing marls and tuffs.

Association: Probertite, glauberite, celestine; or with halite, kaliborite replacing probertite, kalistronite replacing fontarnauite in pseudomorphs after glauberite.

Distribution: From the Kütahya-Emet 2 and 188 (Doğanlar) boreholes, Emet (or Emet-Hisarçık) basin, near Doğanlar, Kütahya Province, Western Anatolia, Turkey.

Name: Honors Dr. Ramon Fontarnau i Griera, in recognition of his efforts to promote the development of scientific facilities focused on mineral characterization.

Type Material: Royal Ontario Museum, Toronto, Canada (M56745).

References: (1) Garcia-Veigas, J., L. Rosell, X. Alcobé, I. Subias, F. Ortí, İ. Gündoğan, and C. Helvacı (2010) Fontarnauite, a new sulphate-borate mineral from the Emet Borate District (Turkey). *Revista de la sociedad española de mineralogía, Macla*, 13, 97-98. (2) Cooper, M.A., F.C. Hawthorne, J. García-Veigas, X. Alcobé, C. Helvacı, E.S. Grew, and N.A. Ball (2015) Fontarnauite, (Na,K)₂(Sr,Ca)(SO₄)[B₅O₈(OH)](H₂O)₂, a new sulfate-borate mineral from Doğanlar (Emet), Kütahya province, Western Anatolia, Turkey. *Can. Mineral.*, 53(5), 803-820. (3) (2016) *Amer. Mineral.*, 101, 2779-2780 (abs. refs. 1 & 2).