

Fluorcaphite

Ca(Sr, Na, Ca)(Ca, Sr, Ce)₃(PO₄)₃(F, OH)

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Crystal Data: Hexagonal. *Point Group:* 6. Subhedral slender prisms, to 5 mm, in aggregates.

Physical Properties: *Tenacity:* Brittle. Hardness = 5 D(meas.) = 3.60 D(calc.) = 3.57

Optical Properties: Transparent. *Color:* Light to bright yellow. *Luster:* Vitreous.
Optical Class: Uniaxial (-). $\omega = 1.649$ $\epsilon = 1.637$

Cell Data: *Space Group:* $P6_3$. $a = 9.485(3)$ $c = 7.000(3)$ $Z = 2$

X-ray Powder Pattern: Khibiny massif, Kola Peninsula, Russia.
2.838 (100), 2.740 (53), 2.814 (48), 3.498 (45), 1.865 (31), 3.104 (22), 1.963 (21)

Chemistry:	(1)		(1)	
	P ₂ O ₅	36.23	CaO	30.46
	SiO ₂	0.57	SrO	20.78
	La ₂ O ₃	2.61	BaO	0.03
	Ce ₂ O ₃	4.78	Na ₂ O	1.74
	Pr ₂ O ₃	0.34	F	2.17
	Nd ₂ O ₃	1.48	H ₂ O	[0.52]
	Sm ₂ O ₃	0.14	-O = F ₂	0.91
			Total	[100.94]

(1) Khibiny massif, Kola Peninsula, Russia; by electron microprobe, average of seven analyses; corresponds to $(\text{Ca}_{3.16}\text{Sr}_{1.16}\text{Na}_{0.32})_{\Sigma=4.64}(\text{Ce}_{0.17}\text{La}_{0.10}\text{Nd}_{0.05}\text{Pr}_{0.01})_{\Sigma=0.33}[(\text{PO}_4)_{2.96}(\text{SiO}_4)_{0.06}]_{\Sigma=3.02}[\text{F}_{0.66}(\text{OH})_{0.34}]_{\Sigma=1.00}$; structurally recast as $\text{Ca}_{1.0}(\text{Sr}_{0.5}\text{Na}_{0.3}\text{Ca}_{0.2})_{\Sigma=1.0}(\text{Ca}_{2.1}\text{Sr}_{0.6}\text{Ce}_{0.3})_{\Sigma=3.0}[(\text{PO}_4)_{2.9}(\text{SiO}_4)_{0.1}]_{\Sigma=3.0}[\text{F}_{0.7}(\text{OH})_{0.3}]_{\Sigma=1.0}$.

Occurrence: In miarolitic cavities in a hyperagpaitic pegmatite in a differentiated alkalic massif.

Association: Deloneite-(Ce), belovite-(Ce), alkalic amphibole, lamprophyllite, labuntsovite, wadeite, sazykinaite-(Y), remondite-(La), sphalerite, galena, fluorite, graphite.

Distribution: From Mt. Koashva, Khibiny massif, Kola Peninsula, Russia.

Name: For FLUORine, CALcium, and PHosphorus in the composition.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.

References: (1) Khomyakov, A.P., I.M. Kulikova, and R.K. Rastsvetaeva (1997) Fluorcaphite $\text{Ca}(\text{Sr}, \text{Na}, \text{Ca})(\text{Ca}, \text{Sr}, \text{Ce})_3(\text{PO}_4)_3\text{F}$ – a new mineral with the apatite structural motif. *Zap. Vses. Mineral. Obshch.*, 126(3), 87–97 (in Russian with English abs.). (2) (1998) *Amer. Mineral.*, 83, 907–908 (abs. ref. 1). (3) Rastsvetaeva, R.K. and A.P. Khomyakov (1996) Structural features of a new naturally occurring representative of the fluorapatite-deloneite series. *Kristallografiya (Sov. Phys. Crystal.)*, 41, 831–834 (in Russian). (4) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union, 88.