

Deloneite-(Ce)**NaCa₂SrCe(PO₄)₃F**

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Crystal Data: Hexagonal. *Point Group:* 3. Granular, to 1.5 mm.**Physical Properties:** *Cleavage:* On {10 $\bar{1}$ 0} and {0001}. *Fracture:* Uneven.*Tenacity:* Brittle. Hardness = 5 D(meas.) = 3.92(5) D(calc.) = 3.95**Optical Properties:** Transparent. *Color:* Bright yellow. *Streak:* White. *Luster:* Vitreous.*Optical Class:* Uniaxial (-). $\omega = 1.682(2)$ $\epsilon = 1.660(2)$ **Cell Data:** *Space Group:* P3. $a = 9.51(1)$ $c = 7.01(1)$ $Z = 2$ **X-ray Powder Pattern:** Mt. Koashva, Kola Peninsula, Russia.

2.84 (100b), 3.12 (40), 2.753 (40), 3.51 (30), 1.967 (30), 1.870 (30), 2.288 (20)

Chemistry:

	(1)		(1)
P ₂ O ₅	30.71	CaO	14.77
SiO ₂	0.74	SrO	18.19
ThO ₂	0.02	BaO	0.10
Y ₂ O ₃	0.02	Na ₂ O	4.45
La ₂ O ₃	8.12	K ₂ O	0.07
Ce ₂ O ₃	13.15	F	2.03
Pr ₂ O ₃	1.13	H ₂ O	[0.38]
Nd ₂ O ₃	3.81	-O = F ₂	0.85
Sm ₂ O ₃	0.34	Total	97.18

(1) Mt. Koashva, Kola Peninsula, Russia; by electron microprobe, corresponds to
 $(\text{Na}_{0.96}\text{K}_{0.01})_{\Sigma=0.97}\text{Ca}_{1.77}\text{Sr}_{1.18}(\text{Ce}_{0.54}\text{La}_{0.34}\text{Nd}_{0.15}\text{Pr}_{0.04}\text{Sm}_{0.02})_{\Sigma=1.09}[(\text{P}_{0.97}\text{Si}_{0.03})_{\Sigma=1.00}\text{O}_4]_3$
 $[\text{F}_{0.72}(\text{OH})_{0.28}]_{\Sigma=1.00}$.

Occurrence: In the natrolite core of a pegmatite in a differentiated alkalic massif.**Association:** Fluorcapthite, belovite-(Ce), lomonosovite, sitinakite, fluorite.**Distribution:** From Mt. Koashva, Khibiny massif, Kola Peninsula, Russia.**Name:** To honor Boris Nikolaevich Delone (1890–1980), crystallographer and mathematician, Mathematics Institute, Moscow, Russia.**Type Material:** A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.

References: (1) Khomyakov, A.P., D.V. Lisitsin, I.M. Kulikova, and R.K. Rastsvetaeva (1996) Deloneite-(Ce) NaCa₂SrCe(PO₄)₃F – a new mineral with a belovite-like structure. *Zap. Vses. Mineral. Obshch.*, 125(5), 83–94 (in Russian with English abs.). (2) Rastsvetaeva, R.K. and A.P. Khomyakov (1996) Crystal structure of deloneite-(Ce), the highly ordered Ca analog of belovite. *Doklady Acad. Nauk SSSR*, 349, 354–357 (in Russian). (3) (1997) *Amer. Mineral.*, 82, 820 (abs. ref. 1–2). (4) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union, 72.