

Crystal Data: Monoclinic. *Point Group:* 2/m. As rounded pseudo-hexagonal inclusions, to 7 mm, in thernonatrite; as elongate, untwinned, pseudo-hexagonal prisms, to 2 cm. Polysynthetic pseudorhomboidal twinning observed.

Physical Properties: *Fracture:* Conchoidal. *Hardness:* = 3
D(meas.) = 2.85 D(calc.) = 2.880 Soluble in H₂O.

Optical Properties: Transparent. *Color:* Colorless. *Luster:* Vitreous.
Optical Class: Biaxial (-). *Dispersion:* $r > v$, weak. $\alpha = 1.508(2)$ $\beta = 1.515(2)$ $\gamma = 1.520(2)$
2V(meas.) = 80°

Cell Data: *Space Group:* P2₁/c. $a = 13.3185(14)$ $b = 7.0964(8)$ $c = 10.6490(11)$
 $\beta = 113.5260(10)^\circ$ $Z = 8$

X-ray Powder Pattern: Mt. Rasvumchorr, Kola Peninsula, Russia.
2.649 (100), 3.054 (45), 3.049 (40), 2.005 (40), 1.762 (33), 3.51 (24), 1.470 (21)

Chemistry:	(1)	(2)
P ₂ O ₅	36.00	35.48
MnO	0.39	
CaO	26.66	28.04
SrO	0.55	
Na ₂ O	31.44	30.98
K ₂ O	0.10	
F	9.32	9.50
-O = F ₂	3.92	4.00
Total	100.54	100.00

(1) Mt. Rasvumchorr, Kola Peninsula, Russia; corresponding to Na_{1.99}(Ca_{0.94}Sr_{0.01}Mn_{0.01})_{Σ=0.96}P_{1.00}O_{3.97}F_{0.97}. (2) Na₂Ca(PO₄)F.

Occurrence: A rare late-stage hydrothermal mineral in ijolite-urtite pegmatite.

Association: Thernonatrite, villiaumite, aegirine, apatite, barytolamprophyllite (Khibiny massif); interstitial with nepheline, potassic arfvedsonite, microcline, eudialyte and associated with sodalite, kalsilite, pectolite, lamprophyllite, lomonosovite, ershovite, loparite-(Ce), djerfisherite. (Mt. Rasvumchorr).

Distribution: On Mts. Rasvumchorr, Yukspor, and Koashva, Khibiny massif, Kola Peninsula, Russia.

Name: For sodium, NAtrium, CAlcium, and PHosphorus in the composition.

Type Material: Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5534; Mining Institute, St. Petersburg, 1116/2; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 79854; The Natural History Museum, London, England, 1994,15.

References: (1) Khomyakov, A.P., M.Y. Kazakova, and D.Y. Pushcharovskiy (1980) Nacaphite (N₂Ca(PO₄)F) - a new mineral. Zap. Vses. Mineral. Obshch., 109, 50-52 (in Russian). (2) (1981) Amer. Mineral., 66, 218 (abs. ref. 1). (3) Sokolova, E.V., Y.K. Egorov-Tismenko, and A.P. Khomyakov (1989) The crystal structure of nacaphite. Doklady Acad. Nauk SSSR, 304, 610-615 (in Russian). (4) Krivovichev, S.V., V.N. Yakovenchuk, G.Y. Ivanyuk, Y.A. Pakhomovsky, T. Armbruster, and E.A. Selivanova (2007) The crystal structure of nacaphite, Na₂Ca(PO₄)F: a re-investigation. Can. Mineral., 45, 915-920.