Clinophosinaite $Na_3Ca(SiO_3)(PO_4)$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Habit not described.

Physical Properties: *Fracture:* Conchoidal. Hardness = 4 D(meas.) = 2.85–2.88 D(calc.) = [2.84]

Optical Properties: Semitransparent. *Color:* Pale lilac. *Luster:* Vitreous. *Optical Class:* Biaxial (+). α = 1.556–1.557 β = 1.559–1.561 γ = 1.563–1.567 2V(meas.) = 75°–80°

Cell Data: *Space Group:* $P2/c$. a = 7.303(2) b = 12.201(5) c = 14.715(4) $\beta = 91°56'$ Z = 8

X-ray Powder Pattern: Mt. Koashva, Russia.
2.724 (100), 2.639 (57), 2.550 (50), 2.031 (50), 1.823 (47), 1.838 (35), 3.97 (12)

Chemistry:

	(1)	(2)	(3)
SiO_2	20.1	20.1	21.45
Ce_2O_3	0.18	0.44	
MnO	0.60	0.54	
CaO	15.65	16.45	20.02
SrO	3.08	1.91	
Na_2O	32.55	32.7	33.19
K_2O	0.09	0.05	
P_2O_5	25.35	25.5	25.34
LOI	1.08	2.55	
Total	98.68	100.24	100.00

(1) Mt. Koashva, Russia; by electron microprobe, contains traces of Ti, Zr, Al, Fe, Mg, Ba, loss on ignition may be H_2O; corresponds to $(Na_{3.04}K_{0.01})_{\Sigma=3.05}(Ca_{0.81}Sr_{0.09}Mn_{0.02})_{\Sigma=0.92}Si_{0.97}P_{1.03}O_{6.95}$. (2) Mt. Yukspor, Russia; by electron microprobe, impurities as in (1), corresponds to $Na_{3.04}(Ca_{0.85}Sr_{0.05}Mn_{0.02})_{\Sigma=0.92}Si_{0.96}P_{1.04}O_{6.97}$. (3) $Na_3CaPSiO_7$.

Occurrence: Apparently as an alteration product of eudialyte in alkalic pegmatites in a differentiated alkalic massif.

Association: Zirsinalite, eudialyte.

Distribution: In Russia, on Mts. Yukspor and Koashva, Khibiny massif, Kola Peninsula.

Name: For its monoclinic crystallography and chemical similarity to *phosinaite*.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 81592.

References: (1) Khomyakov, A.P., D.Y. Pushcharovskii, and J.G. Ronsbo (1981) Clinophosinaite, $Na_3CaPSiO_7$, a new mineral. Zap. Vses. Mineral. Obshch., 110, 351–355 (in Russian). (2) (1982) Amer. Mineral., 67, 414 (abs. ref. 1). (3) Krutik, V.M, D.Y. Pushcharovskii, A.P. Khomyakov, E.A. Pobedimskaya, and N.V. Belov (1980) Anion radical of mixed type (four $[Si_4O_{12}]$ rings and P orthotetrahedra) in the structure of monoclinic phosinaite. Kristallografiya (Sov. Phys. Crystal.), 25, 240–247 (in Russian).