Kyanoxalite $Na_7(Al_{5-6}Si_{6-7}O_{24})(C_2O_4)_{0.5-1.0}\cdot 5H_2O$

Crystal Data: Hexagonal. *Point Group*: 6. Fills the interstices between nepheline and aegirine crystals as semi-faced or irregularly shaped prismatic or equant crystals to 5 mm, as aggregates to 7 mm, and veinlets to 0.5 mm thick.

Physical Properties: *Cleavage*: Perfect on {100}. *Tenacity*: Brittle. Hardness = 5-5.5 D(meas.) = 2.285(15)-2.30(1) D(calc.) = 2.327 Nonfluorescent.

Optical Properties: Transparent. *Color*: Bright light blue (darkens on exposure to sun light), greenish light blue, grayish light blue, colorless. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (-). ω = 1.494(1) ε = 1.491(1) *Pleochroism*: Distinct, *E* = colorless, *O* = light blue.

Cell Data: *Space Group*: $P6_3$. *a* = 12.744(8) c = 5.213(6) Z = 1

X-ray Powder Pattern: Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia. 3.264 (100), 4.73 (92), 3.679 (72), 6.39 (44), 2.618 (36), 2.760 (29), 2.216 (29)

Chemistry:

	(1)
Na_2O	19.70
K_2O	1.92
CaO	0.17
Al_2O_3	27.41
SiO_2	38.68
P_2O_5	0.64
SO_3	1.05
C_2O_3	3.23
H_2O	8.42
Total	101.18

(1) Mt. Karnasurt, Lovozero massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by anion chromatography and IR spectroscopy, H_2O by modified Penfield method, C by selective sorption of pyrolysis products; corresponds to $(Na_{6.45}K_{0.41}Ca_{0.03})_{\Sigma=6.89}(Si_{6.53}Al_{5.46}O_{24})[(C_2O_4)_{0.455}(SO_4)_{0.13}(PO_4)_{0.09}(OH)_{0.01}]_{\Sigma=0.68}\cdot 4.74H_2O$.

Mineral Group: Cancrinite group, cancrinite solid solution subgroup.

Occurrence: A rock-forming mineral in hydrothermally altered peralkaline rocks and pegmatites of an alkaline massif.

Association: Nepheline, aegirine, sodalite, nosean, albite, lomonosovite, murmanite, fluorapatite, loparite, natrolite.

Distribution: At Mt. Karnasurt and Mt. Alluaiv, Lovozero massif, Kola Peninsula, Russia.

Name: For its color, *kyan*os (Greek for *blue*), and presence of species-defining *oxal*ate anion.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (3735/1).

References: (1) Chukanov, N.V., I.V. Pekov, L.V. Olysych, W. Massa, O.V. Yakubovich, A.E. Zadov, R.K. Rastsvetaeva, and M.F. Vigasina (2010) Kyanoxalite - a new cancrinite-group mineral with extra-framework oxalate anion, from Lovozero alkaline massif, Kola Peninsula. Geology of Ore Deposits, 52(8), 778-790. (2) Chukanov, N.V., I.V. Pekov, I.V. Olysych, N.V. Zubkova, and M.F. Vigasina (2011) Crystal chemistry of cancrinite-group minerals with an AB-type framework: A review and new data. II. IR spectroscopy and its crystal-chemical implications. Can. Mineral., 49, 1151-1164. (3) Pekov, I.V., L.V. Olysych, N.V. Chukanov, N.V. Zubkova, D.Y. Pushcharovsky, K. Van, G. Giester, and E. Tillmanns (2011) Crystal chemistry of cancrinite-group minerals with an AB-type framework: A review and new data. I. Chemical and structural variations. Can. Mineral., 49, 1129-1150.