Andrianovite $Na_{12}(K, Sr, Ce)_3Ca_6Mn_3Zr_3Nb(Si_{25}O_{73})(O, H_2O, OH)_5$

Crystal Data: Hexagonal. *Point Group*: 3/*m*. As rims to 1.0 mm on eudialyte crystals.

Physical Properties: *Cleavage*: Imperfect on (001). *Tenacity*: Brittle. *Fracture*: Stepped. Hardness = 5 D(meas.) = 2.93(2) D(calc.) = 3.02 Nonfluorescent.

Optical Properties: Transparent to translucent. *Color*: Light yellow. *Streak*: White. *Luster*: Vitreous.
Optical Class: Uniaxial (-). ω = 1.622(2) ε = 1.617(2) Nonpleochroic.

Cell Data: *Space Group*: *R*3*m*. *a* = 14.281(4) *c* = 30.243(7) Z = 3

X-Ray Diffraction Pattern: Koashva mine, Khibiny massif, Kola Peninsula, Russia.
2.982 (100), 2.860 (94), 4.322 (71), 3.222 (70), 6.447 (60), 3.170 (50), 5.719 (40)

Chemistry:

	(1)		(1)
Na_2O	11.61	Al_2O_3	0.02
K_2O	2.05	SiO_2	47.06
CaO	10.26	TiO_2	0.12
SrO	3.11	ZrO_2	11.32
BaO	0.19	HfO_2	0.26
MnO	3.97	Nb_2O_5	2.84
FeO	2.43	Cl	0.31
La_2O_3	0.81	CO_2	0.57
Ce_2O_3	1.73	H_2O	0.87
Nd_2O_3	0.52	$-O = Cl_2$	0.07
Y_2O_3	0.28	Total	100.26

(1) Koashva mine, Khibiny massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, H_2O and CO_2 by chemical analysis; corresponds to $Na_{12.09}(K_{1.40}Sr_{0.97}REE_{0.60}Ba_{0.04})_{\Sigma=3.01}(Ca_{5.90}Y_{0.08})_{\Sigma=5.98}(Mn_{1.81}Fe^{2+}_{1.09})_{\Sigma=2.90}(Zr_{2.96}Hf_{0.04})_{\Sigma=3.0}(Nb_{0.69}Si_{0.27}Ti_{0.05}Al_{0.01})_{\Sigma=1.02}(Si_{25}O_{73})[O_{2.14}(OH)_{0.52}]_{\Sigma=2.66}[(H_2O)_{1.30}(CO_3)_{0.42}Cl_{0.28}]_{\Sigma=2.0}$.

Mineral Group: Eudialyte group, kentbrooksite subgroup.

Occurrence: In hyperperalkaline pegmatite in an alkaline massif.

Association: Aegirine, sodalite, microcline, natrolite, lomonosovite, lamprophyllite, mosandrite, villiaumite.

Distribution: From the Koashva mine, Khibiny massif, Kola Peninsula, Russia.

Name: Honors Valerii Ivanovich *Andrianov* (1938-1991), Russian mathematician and crystallographer.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (3586/1-3).

References: (1) Khomyakov, A.P., G.N. Nechelyustov, R.K. Rastsvetaeva, and K.A. Rozenberg (2008) Andrianovite, $Na_{12}(K,Sr,Ce)_3Ca_6Mn_3Zr_3NbSi_{25}O_{73}(O,H_2O,OH)_5$, a new potassium-rich mineral of the eudialyte group from Khibiny Alkaline Massif, Kola Peninsula, Russia. Geology of Ore Deposits 50, 705-712.