Belovite-(La) $NaSr_3(La,Ce)(PO_4)_3(F,OH)$

Crystal Data: Hexagonal. *Point Group:* $\overline{3}$. Prismatic crystals, to 3 cm, with large $\{10\overline{1}0\}$, $\{10\overline{1}1\}$, $\{10\overline{1}\overline{1}\}$, $\{0001\}$, modified by $\{11\overline{2}0\}$, $\{11\overline{2}1\}$, $\{11\overline{2}\overline{1}\}$; may be granular.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Very brittle. Hardness = ∼5 VHN = 450 (30 g load). D(meas.) = 4.19 D(calc.) = 4.05

Optical Properties: Transparent. *Color:* Greenish yellow to bright yellow. *Luster:* Vitreous. *Optical Class:* Uniaxial (–). $\omega = 1.653$ $\epsilon = 1.635$–1.636

Cell Data: *Space Group:* $P\overline{3}$. $a = 9.647(1)$ $c = 7.170(1)$ Z = 2

X-ray Powder Pattern: Mt. Kukisvumchorr, Kola Peninsula, Russia; close to belovite-(Ce). 2.897 (100), 2.884 (100), 3.59 (87), 3.30 (65), 2.790 (54), 1.910 (36), 1.796 (36)

Chemistry:

	(1)		(1)
SO_3	0.03	Gd_2O_3	0.01
P_2O_5	28.30	Y_2O_3	0.01
SiO_2	0.24	CaO	0.50
ThO_2	0.43	SrO	40.09
La_2O_3	13.08	BaO	2.35
Ce_2O_3	8.15	Na_2O	4.09
Pr_2O_3	0.30	F	2.04
Nd_2O_3	0.30	H_2O	0.22
Sm_2O_3	0.03	$-O = F_2$	0.86
		Total	99.31

(1) Mt. Kukisvumchorr, Kola Peninsula, Russia; by electron microprobe, H_2O by the Penfield method; corresponds to $Na_{0.98}(Sr_{2.86}Ba_{0.12}Ca_{0.06})_{\Sigma=3.04}(La_{0.59}Ce_{0.37}Pr_{0.01}Nd_{0.01}Th_{0.01})_{\Sigma=0.99}[(P_{2.95}Si_{0.03})_{\Sigma=2.98}O_{3.99}]_3[F_{0.80}(OH)_{0.18}]_{\Sigma=0.98}$.

Mineral Group: Apatite group.

Occurrence: In natrolite veinlets in pegmatites in a differentiated alkalic massif.

Association: Gaidonnayite, gerasimovskite, lamprophyllite, murmanite, aegirine, pectolite, microcline, natrolite.

Distribution: Found in the Kirov apatite mine, Mt. Kukisvumchorr, and on Mt. Eveslogchorr, Khibiny massif, Kola Peninsula, Russia.

Name: For *lanthanum* dominant over cerium and its relation to *belovite*-(Ce).

Type Material: Mining Institute, St. Petersburg, 3026/24; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, p1523.

References: (1) Pekov, I.V., I.M. Kulikova, Y.K. Kabalov, O.V. Yeletskaya, N.V. Chukanov, Y.P. Men'shikov, and A.P. Khomyakov (1996) Belovite-(La) $Sr_3Na(La,Ce)[PO_4]_3(F,OH)$ – a new rare earth mineral in the apatite group. Zap. Vses. Mineral. Obshch., 125(3), 101–109 (in Russian with English abs.). (2) (1997) Amer. Mineral., 82, 620 (abs. ref. 1).