

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals display {010} and $\{2\ 01\}$, with {100} and {001} terminations, as flattened prismatic to acicular individuals to 0.5 mm. *Twinning:* By rotation about [100] forming trillings.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 4 D(meas.) = n.d. D(calc.) = 4.65

Optical Properties: Transparent. *Color:* White, pale green, or colorless. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.581(3)$ $\beta \approx \gamma = 1.715(5)$ $2V(\text{meas.}) = 5(3)^\circ$ $2V(\text{calc.}) = 0^\circ$
Orientation: $X \wedge a = 9^\circ$, $Y = b$, $Z \wedge c \approx 26^\circ$.

Cell Data: *Space Group:* $P2_1/m$. $a = 13.396(4)$ $b = 5.111(1)$ $c = 6.672(2)$ $\beta = 106.628(4)^\circ$
 $Z = 2$

X-ray Powder Pattern: Hilairitovoye pegmatite, Kirovsky mine, Mt. Kukisvumchorr, Khibiny alkaline massif, Kola Peninsula, Russia.

4.01 (100), 3.27 (100), 2.14 (80), 1.998 (80), 2.54 (50), 1.636 (20), 1.370 (20)

Chemistry:	(1)		(1)
Na ₂ O	0.23	Pr ₂ O ₃	0.87
K ₂ O	0.27	Nd ₂ O ₃	0.76
CaO	0.99	ThO ₂	9.41
SrO	2.38	CO ₂	21.30
BaO	44.10	F	3.38
La ₂ O ₃	11.18	<u>- O = F</u>	<u>1.42</u>
Ce ₂ O ₃	5.36	Total	98.81

(1) Hilairitovoye pegmatite, Kirovsky mine, Mt. Kukisvumchorr, Kola Peninsula, Russia; average of 9 electron microprobe analyses supplemented by IR spectroscopy, CO₂ calculated; corresponding to (Ba_{1.78}Sr_{0.14}K_{0.04}) $\Sigma=1.96$ (La_{0.43}Th_{0.22}Ce_{0.20}Ca_{0.11}Na_{0.05}Pr_{0.03}Nd_{0.03}) $\Sigma=1.07$ (CO₃)₃F_{1.10}.

Occurrence: A late hydrothermal mineral in cavities in pegmatite veins cutting an alkaline igneous complex.

Association: Microcline, albite, calcite, nenadkevichite, hilairite, catapleiite, strontianite, donnayite-(Y), synchysite-(Ce), pyrite (one vein); pectolite, aegirine, microcline (a different vein).

Distribution: From the Hilairitovoye pegmatite at the Kirovsky mine, Mt. Kukisvumchorr, Khibiny alkaline massif, Kola Peninsula, Russia.

Name: As the Lanthanum-dominant analog of *kukharenkoite*-(Ce).

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

References: (1) Pekov, I.V., N.V. Chukanov, N.N. Kononkova, A.E. Zadov, and S.V. Krivovichev (2003) Kukharenkoite-(La), Ba₂(La,Ce)(CO₃)₃F, a new mineral from Khibiny massif, Kola Peninsula. *Zapiski Vseross. Mineral. Obshch.*, 132(3), 55-64 (in Russian, English abs.).
 (2) Krivovichev, S.V., T. Armbruster, and I.V. Pekov (2003) Cation frameworks in the structure of natural fluorocarbonates of barium and rare-earth elements: Crystal structure of kukharenkoite-(La), Ba₂(La,Ce)(CO₃)₃F. *Zapiski Vseross. Mineral. Obshch.*, 132(3), 65-72 (in Russian, English abs.).
 (3) (2004) *Amer. Mineral.*, 89, 1828-1829 (abs. refs. 1 & 2).