## Labuntsovite-Fe $Na_4K_4Fe^{2+}_2Ti_8O_4(Si_4O_{12})_4(OH)_4 \cdot 10\text{-}12H_2O$

**Crystal Data**: Monoclinic. *Point Group*: 2/*m*. As anhedral grains to 2 mm; in aggregates to 0.5 cm.

**Physical Properties**: *Cleavage*: n.d. *Tenacity*: n.d. *Fracture*: n.d. Hardness = 5
D(meas.) = 2.94(2) D(calc.) = 2.93

**Optical Properties**: Translucent to transparent. *Color*: Orange. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (+). $\alpha$ = 1.686(2) $\beta$ = 1.696(2) $\gamma$ = 1.835(3) 2V(meas.) = 32(1)° *Orientation*: $a = Z$, $b = Y$, $c \wedge X = 27°$ in obtuse $\beta$. *Pleochroism*: $X = Z$ = pale yellow, $Y$ = orange.

**Cell Data**: *Space Group*: *C*2/*m*. $a$ = 14.249(6) $b$ = 13.791(6) $c$ = 7.777(2) $\beta$ = 116.82(3)° Z = 1

**X-ray Powder Pattern**: Mount Kukisvumchorr, Khibiny alkaline massif, Kola Peninsula, Russia. 3.169 (100), 3.100 (62), 2.585 (58), 6.95 (56), 3.032 (53), 6.34 (34), 2.478 (25)

**Chemistry**:

| | (1) | | (1) |
|---|---|---|---|
| $Na_2O$ | 5.45 | $Al_2O_3$ | 0.04 |
| $K_2O$ | 8.54 | $SiO_2$ | 39.66 |
| SrO | 0.10 | $TiO_2$ | 25.61 |
| BaO | 8.02 | $ZrO_2$ | 0.05 |
| FeO | 2.41 | $Nb_2O_5$ | 1.11 |
| MgO | 0.30 | $H_2O$ | 8.20 |
| MnO | 0.23 | Total | 99.72 |

(1) Mount Kukisvumchorr, Khibiny alkaline massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, $H_2O$ by TGA; corresponding to $Na_4(K_{3.74}Na_{0.26})_{\Sigma=4.00}[(H_2O)_{2.14}Ba_{1.27}K_{0.65}Sr_{0.02}](\square_{0.93}Fe_{0.81}Mg_{0.18}Mn_{0.08})_{\Sigma=2}(Ti_{7.76}Nb_{0.20}Zr_{0.01})_{\Sigma=7.97}(Si_{15.98}Al_{0.02})_{\Sigma=16.00}O_{48}[O_{5.43}(OH)_{2.57}]_{\Sigma=8.00} \cdot 7.66H_2O$.

**Mineral Group**: Labuntsovite subgroup of the labuntsovite group.

**Occurrence**: In K-feldspar-natrolite-calcite veinlets in hydrothermally altered urtite.

**Association**: Pectolite, fluorite, aegirine, neskevaaraite-Fe.

**Distribution**: From level +252 m, Kirovskii mine, Mount Kukisvumchorr, Khibiny alkaline massif, Kola Peninsula, Russia.

**Name**: Suffix, *Fe*, refers to the iron-dominance in the D site of a member of the *labuntsovite* subgroup.

**Type Material**: A.E. Fersman Mineralogical Museum, Moscow, Russia (91285).

**References**: (1) Khomyakov, A.P., G.N. Nechelyustov, G. Ferraris, A. Gula, and G. Ivaldi (2001) Labuntsovite-Fe and labuntsovite-Mg- two new minerals from the Khibina and Kovdor alkaline massifs, Kola Peninsula. Zap. Ross. Mineral. Obshch., 130(4), 36-45. (2) (2002) Amer. Mineral., 87, 1732-1733 (abs. ref. 1). (3) Chukanov, N.V., I.V. Pekov, and A.P. Khomyakov (2002) Recommended nomenclature for labuntsovite-group minerals. Eur. J. Mineral., 14, 165-173. (4) Pekov, I.V. (2007) New minerals from former Soviet Union countries, 1998-2006. Mineral. Almanac, 11, 30-31.