Ivanyukite-Cu  
Cu[TiO$_2$(OH)$_2$(SiO$_4$)$_3$]·7H$_2$O

Crystal Data: Cubic.  
*Point Group:* 4 3m.  As cubic crystals to 1.5 mm.  *Twinning:* None observed.

Physical Properties:  
*Cleavage:* Perfect on {100}.  *Tenacity:* Brittle.  *Fracture:* Stepped.  
Hardness = ~4  
D(meas.) = 2.70  
D(calc.) = 2.46

Optical Properties:  
*Transparency:* In thin section transparent to translucent.  *Color:* Bright green; colorless in thin section.  
*Streak:* Pale green.  
*Luster:* Vitreous.  
*Optical Class:* Isotropic.  
*n = 1.73(1)

Cell Data:  
*Space Group:* P 4 3m.  
7.850(7)  
Z = 1

X-ray Powder Pattern:  
Koashva Quarry, Khibiny Massif, Kola Peninsula, Russia.  
7.87 (100), 3.205 (80), 2.616 (30), 2.481 (30), 1.960 (30), 1.843 (30), 3.94 (20)

Chemistry:  
\[
\begin{array}{ll}
\text{Na$_2$O} & 0.17 \\
\text{Al$_2$O$_3$} & 0.07 \\
\text{SiO$_2$} & 24.80 \\
\text{K$_2$O} & 2.80 \\
\text{CaO} & 0.23 \\
\text{TiO$_2$} & 38.36 \\
\text{MnO} & 0.28 \\
\text{FeO} & 0.73 \\
\text{CuO} & 6.81 \\
\text{Nb$_2$O$_5$} & 3.02 \\
\text{H$_2$O} & 21.50 \\
\text{Total} & 98.97 \\
\end{array}
\]

(1) Koashva Quarry, Khibiny Massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, H$_2$O by the Penfield method; corresponding to (Cu$_{0.62}$K$_{0.43}$Na$_{0.40}$Ca$_{0.03}$)$_2$·1.12[Ti$_{3.48}$Nb$_{0.16}$Fe$_{0.07}$Mn$_{0.03}$]$_2$·3.74(Si$_{2.99}$Al$_{0.01}$)$_2$·3.80(OH)$_{2.88}$·7.21H$_2$O.

Mineral Group: Pharmacosiderite supergroup, ivanyukite group.

Occurrence: A late-stage, hydrothermal phase in natrolitized microcline-aegirine-sodalite lens in orthoclase-bearing urtite.

Association: Microcline, vinogradovite, sazykinaite-(Y), natrolite, djerfisherite, chalcopyrite, chalcocite.

Distribution: From the Koashva Quarry, Koashva Mountain, Khibiny Massif, Kola Peninsula, Russia.

Name: Honors Gregory Yur’evich Ivanyuk, Russian mineralogist and petrologist, head of the Laboratory of Self-Organized Mineral Systems, Geological Institute, Kola Science Center, Russian Academy of Sciences, for his contributions to the petrology and mineralogy of banded iron formations, and alkaline and alkaline-ultrabasic massifs. The suffix indicates the dominant extra-framework cation, Cu.

Type Material: Geological and Mineralogical Museum, Geological Institute, Kola Science Center, Russian Academy of Sciences, Apatity, Russia (6354).

References:  