

Crystal Data: Orthorhombic. *Point Group:* 222. Crystals platy, flattened on {010}, to 1 mm, with forms {010}, {101}, {110}, and {001}.

Physical Properties: *Cleavage:* On {010}, perfect, micaceous; {100}, less perfect. Hardness = ~4.5 VHN = 305–401, 381 average. D(meas.) = 2.79 D(calc.) = 2.79 Weak yellowish fluorescence under UV.

Optical Properties: Semitransparent. *Color:* Colorless to yellowish. *Luster:* Vitreous. *Optical Class:* Biaxial (-). *Orientation:* X = c; Y = b; Z = a. $\alpha = 1.596(2)$ $\beta = 1.619(2)$ $\gamma = \text{n.d.}$ $2V(\text{meas.}) = 80^\circ$

Cell Data: *Space Group:* P2₁2₁2₁. a = 10.208(2) b = 13.241(4) c = 7.174(1) Z = 4

X-ray Powder Pattern: Khibiny massif, Russia. 3.02 (10b), 5.91 (9), 2.87 (8), 1.797 (8b), 3.31 (7), 6.56 (6b), 2.156 (4)

Chemistry:	(1)	(2)
SiO ₂	42.36	43.37
TiO ₂	3.33	
ZrO ₂	22.28	29.64
HfO ₂	0.43	
Fe ₂ O ₃	0.12	
CaO	0.00	
Na ₂ O	0.16	
K ₂ O	22.41	22.66
F	2.00	
H ₂ O	5.03	4.33
-O = F ₂	0.84	
Total	97.28	100.00

(1) Khibiny massif, Russia; by electron microprobe, average of three analyses; corresponds to (K_{2.02}Na_{0.02})_{Σ=2.04}(Zr_{0.77}Ti_{0.18}Hf_{0.01}Fe_{0.01})_{Σ=0.97}Si_{3.00}O_{9.92}H_{2.38}F_{0.45}. (2) K₂ZrSi₃O₉•H₂O.

Polymorphism & Series: Dimorphous with kostylevite.

Occurrence: In pegmatite in a differentiated alkalic massif.

Association: Kostylevite, wadeite, eudialyte, potassic feldspar, aegirine.

Distribution: In the valley of the Vuonnemiok River, Khibiny massif, Kola Peninsula, Russia.

Name: For Lake Umbozero, which separates the Khibiny massif from the Lovozero massif, Kola Peninsula, Russia.

Type Material: Geology Museum, Kola Branch, Academy of Sciences, Apatity; Mineralogical Museum, St. Petersburg University, St. Petersburg, 17072; Mining Institute, St. Petersburg, 1631/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 82758; The Natural History Museum, London, England, 1994,35.

References: (1) Khomyakov, A.P., A.A. Voronkov, Y.S. Kobayashv, and L.I. Polezhaeva (1983) Umbite and paraumbite, new potassium zirconosilicates from the Khibiny alkalic massif. Zap. Vses. Mineral. Obshch., 112, 461–469 (in Russian). (2) Ilyushin, G.D., Z.V. Pudovkina, A.A. Voronkov, A.P. Khomyakov, V.V. Ilyukhin, and Y.A. Pyatenko (1981) Crystal structure of a new natural modification of K₂ZrSi₃O₉•H₂O. Doklady Acad. Nauk SSSR, 257, 608–610 (in Russian). (3) (1984) Amer. Mineral., 69, 813–814 (abs. refs. 1 and 2).

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