Zircophyllite $(K,Na)_3(Fe^{2+},Mn^{2+})_7(Zr,Nb)_2Si_8O_{24}(OH,F)_7$

Crystal Data: Triclinic, probable. *Point Group:* n.d. In platy micaceous crystals, to 2 cm.

Physical Properties: *Cleavage:* {001}, perfect. *Tenacity:* Extremely brittle. Hardness = 4–4.5 D(meas.) = 3.34 D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* Dark brown to nearly black. *Streak:* Pale brown. *Luster:* Vitreous to adamantine.
Optical Class: Biaxial (–). *Pleochroism:* $X = Y$ = dark yellow; Z = brown. *Orientation:* Y = a; $X \wedge b = 9°$–$11°$; $Z \perp \{001\}$. *Dispersion:* $r > v$, strong. $\alpha = 1.708$ $\beta = 1.738$ $\gamma = 1.747$ 2V(meas.) = 62°

Cell Data: *Space Group:* n.d. Z = n.d.

X-ray Powder Pattern: Korgeredabinsh massif, Russia.
3.50 (10), 2.80 (7), 2.66 (5), 2.10 (5), 9.80 (4), 3.75 (3), 3.26 (3)

Chemistry:

	(1)
SiO_2	32.64
TiO_2	2.30
ZrO_2	13.61
HfO_2	1.2
Nb_2O_5	2.30
FeO	18.06
MnO	18.83
CaO	0.94
Na_2O	1.55
K_2O	5.61
F	1.20
H_2O	3.20
$-O = F_2$	0.49
Total	99.75

(1) Korgeredabinsh massif, Russia; Hf by spectrographic analysis, traces of Y, Pb, Be, Sr, Ba; corresponds to $(K_{1.70}Na_{0.71}Mn_{0.35}Ca_{0.24})_{\Sigma=3.00}(Fe_{3.57}Mn_{3.43})_{\Sigma=7.00}(Zr_{1.58}Nb_{0.25}Ti_{0.17})_{\Sigma=2.00}(Si_{7.76}Ti_{0.24})_{\Sigma=8.00}O_{24}[(OH)_{3.24}O_{2.84}F_{0.90}]_{\Sigma=6.98} \bullet 0.9H_2O$.

Mineral Group: Astrophyllite group.

Occurrence: In the natrolite zone of alkalic pegmatites.

Association: "Aegirine-augite," leucophanite, fluorite, apatite, apophyllite.

Distribution: From the Korgeredaba alkaline massif, Sangilen Upland, southeastern Tuva, Russia.

Name: For ZIRCOnium in the composition and the Greek for *leaf*, in reference to its foliated, micaceous habit.

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

References: (1) Kapustin, Y.L. (1972) Zircophyllite, the zirconium analogue of astrophyllite. Zap. Vses. Mineral. Obshch., 101, 459–463 (in Russian). (2) (1973) Amer. Mineral., 58, 967 (abs. ref. 1).