Ershovite $Na_4K_3(Fe,Mn,Ti)_2Si_8O_{20}(OH)_4 \cdot 5H_2O$

Crystal Data: Triclinic. *Point Group:* $\overline{1}$. Forms parallel fibrous aggregates, fibers elongated along [001], to 3 cm; in disseminated elongated grains, to 1 cm.

Physical Properties: *Cleavage:* {100} and {010}, perfect. *Fracture:* Fibrous.
Hardness = 2–3 D(meas.) = 2.75(2) D(calc.) = 2.73

Optical Properties: Translucent; transparent in thin section. *Color:* Olive-green with brown and yellow tinges. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Pleochroism:* Strong; $X = Y$ = light green or yellow; Z = dark olive-green. *Orientation:* $X \wedge c = 86°$; $Y \wedge c = 73°$; $Z \wedge c = 17°$. *Dispersion:* $r > v$.
$\alpha = 1.569(2)$ $\beta = 1.574(2)$ $\gamma = 1.590(2)$ 2V(meas.) = 58(2)° 2V(calc.) = 59°

Cell Data: *Space Group:* $P\overline{1}$. $a = 10.244(2)$ $b = 11.924(3)$ $c = 5.276(3)$
$\alpha = 103.491(2)°$ $\beta = 96.960(3)°$ $\gamma = 91.945(3)°$ Z = 1

X-ray Powder Pattern: Khibiny massif, Russia.
11.58 (10), 2.990 (10), 2.709 (8), 1.652 (8), 2.608 (7), 2.459 (6), 2.160 (6)

Chemistry:

	(1)
SiO_2	47.1
TiO_2	3.0
FeO	6.1
MnO	4.7
MgO	0.5
CaO	0.1
Na_2O	12.4
K_2O	13.6
H_2O	[12.5]
Total	[100.0]

(1) Khibiny massif, Russia; by electron microprobe, H_2O by difference; corresponds to $Na_{4.08}K_{2.95}(Fe_{0.87}Mn_{0.68}Ti_{0.38}Mg_{0.13}Ca_{0.02})_{\Sigma=2.08}Si_8O_{19.98}(OH)_{4.04} \cdot 5.06H_2O$.

Occurrence: In unweathered ultra-agpaitic pegmatites in a differentiated alkalic massif.

Association: Orthoclase, nepheline, sodalite, aegirine, alkalic amphibole, villiaumite, natrite, rasvumite, vuonnemite, astrophyllite, shcherbakovite, kazakovite, koashvite, thermonatrite, nacaphite.

Distribution: From Mts. Rasvumchorr and Koashva, Khibiny massif, Kola Peninsula, Russia.

Name: For Professor Vadim Victorovich Ershov (1939–1989), of the Moscow Mining Institute, Moscow, Russia.

Type Material: Geology Museum, Kola Branch, Academy of Sciences, Apatity; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.

References: (1) Khomyakov, A.P., Y.P. Men'shikov, R.K. Rastsvetaeva, and G.N. Nechelyustov (1993) Ershovite $Na_4K_3(Fe,Mn,Ti)_2Si_8O_{20}(OH)_4 \cdot 4H_2O$ – a new mineral. Zap. Vses. Mineral. Obshch., 122(1), 116–120 (in Russian). (2) (1994) Amer. Mineral., 79, 1010 (abs. ref. 1). (3) Rastsvetaeva, R.K., O.Y. Rekhlova, and A.P. Khomyakov (1991) Crystal structure of a new natural Na,K,Fe-silicate. Kristallografiya (Sov. Phys. Crystal.), 36, 892–897 (in Russian).