Ferrisanidine $K[Fe^{3+}Si_3O_8]$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As crusts of cavernous prismatic crystals or irregular grains to 20 μm; sometimes as crusts epitaxially overgrowing crystals of sanidine.

Physical Properties: Cleavage: Perfect. *Tenacity*: Brittle. *Fracture*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.722

Optical Properties: Transparent. *Color*: Colorless to white. *Streak*: White. *Luster*: Vitreous. *Optical Class*: (For synthetic analogue) Biaxial (-). α = 1.584(1) β = 1.595(1) γ = 1.605(1) 2V(meas.) = 85° 2V(calc.) = 86.5° *Orientation*: *Y* = *b*, *Z* ^ *c* = 16(4)°. Non-pleochroic.

Cell Data: *Space Group*: *C*2/*m*. *a* = 8.678(4) *b* = 13.144(8) *c* = 7.337(5) β = 116.39(8)° Z = 4

X-ray Powder Pattern: Arsenatnaya fumarole, Tolbachik volcano, Kamchatka peninsula, Russia. 3.285 (100), 3.342 (84), 4.283 (52), 2.200 (41), 3.819 (36), 2.939 (34), 3.529 (30)

Chemistry:

	(1)	(2)
Na_2O	0.25	0.36
K_2O	15.15	14.9
MgO		0.65
BaO		0.24
TiO_2		0.68
Al_2O_3	0.27	3.36
Fe_2O_3	24.92	18.4
SiO_2	60.50	60.0
Total	101.09	98.7

(1) Arsenatnaya fumarole, Tolbachik volcano, Kamchatka peninsula, Russia; electron microprobe and Raman spectroscopic analyses; corresponds to $(K_{0.97}Na_{0.03})_{\Sigma=1.00}(Si_{3.03}Fe^{3+}_{0.94}Al_{0.02})_{\Sigma=3.99}O_8$.
(2) Leucite Hills, Wyoming, USA; electron microprobe analysis; corresponds to $(K_{0.959}Na_{0.035})_{\Sigma=0.994}(Si_{3.025}Fe^{3+}_{0.698}Al_{0.200}Mg_{0.049}Ti_{0.026})_{\Sigma=3.998}O_8$

Mineral Group: Feldspar group.

Occurrence: A sublimate around an active volcanic fumarole (Russia). In lamproite (USA).

Association: Aegirine, cassiterite, hematite, sylvite, halite, johillerite, arsmirandite, axelite, aphthitalite, badalovite, litidionite, tridymite, polyarsite, evseevite.

Distribution: From the Arsenatnaya fumarole, Second scoria cone of the Northern Breakthrough of the Great Tolbachik Fissure Eruption, Tolbachik volcano, Kamchatka peninsula, Far-Eastern Region, Russia [TL]. In the Leucite Hills, Wyoming, USA.

Name: The prefix indicates an analogue of *sanidine* with essential Fe^{3+} > Al.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (5414/1; 96732).

References: (1) Shchipalkina, N.V., I.V. Pekov, S.N. Britvin, N.N. Koshlyakova, M.F. Vigasina, and E.G. Sidorov (2019) A new mineral ferrisanidine, $K[Fe^{3+}Si_3O_8]$, the first natural feldspar with species-defining iron. Minerals, 9, 770, 1-17. (2) Kuehner, S.M. and D.J. Joswiak (1996) Naturally occurring ferric iron sanidine from the Leucite Hills lamproite. Amer. Mineral., 81, 229-237.