Noonkanbahite $BaKNaTi_2(Si_4O_{12})O_2$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. As prismatic to curved lamellar crystals to 1.5 cm.

Physical Properties: *Cleavage*: Poor on {010} and {100}; weak parting on {011}. F*racture*: Irregular. *Tenacity*: Brittle. D(meas.) = 3.39(1) D(calc.) = 3.49 *Hardness* = 6

Optical Properties: Translucent. *Color*: Pinkish orange, brownish yellow to brown, straw-yellow in aggregates. *Streak*: n.d. *Luster*: Vitreous.
Optical Class: Biaxial (+). α = 1.730(5) β = 1.740(5) γ = 1.765(5) 2V(meas.) = 75(2)° 2V(calc.) = 72.7(9)° *Pleochroism*: Strong, *X* = colorless, *Y* = yellow, *Z* = straw-yellow. *Orientation*: *X* = *a*, *Y* = *b*, *Z* = *c*. *Dispersion*: Moderate, *r* < *v*.

Cell Data: *Space Group*: *Imma*. *a* = 8.0884(4) *b* = 10.497(5) *c* = 13.9372(6) Z = 4

X-ray Powder Pattern: Liley, Eifel Mountains, Germany.
2.907 (100), 8.353 (70), 3.196 (50), 2.097 (50), 2.241 (40), 2.179 (40), 3.377 (30)

Chemistry:

	(1)
SiO_2	37.82
Nb_2O_5	3.18
Al_2O_3	0.17
TiO_2	15.54
ZrO_2	0.42
Fe_2O_3	[5.63]
MnO	0.32
MgO	0.53
BaO	20.60
CaO	1.36
K_2O	5.32
Na_2O	6.14
F	0.78
H_2O	0.58
-O=F	0.33
Total	98.06

(1) Liley, Eifel Mountains, Germany; electron microprobe analysis, Fe_2O_3 calculated from FeO, H_2O determined by SIMS; corresponds to $(Ba_{0.85}K_{0.13})_{\Sigma=0.98}(K_{0.59}Na_{0.26}Ca_{0.15})_{\Sigma=1.00}Na(Ti_{1.23}Fe^{3+}_{0.45}Nb_{0.15}Mg_{0.08}Mn_{0.03}Zr_{0.02}Al_{0.01})_{\Sigma=1.97}(Si_{3.99}Al_{0.01}O_{12})(O_{1.33}OH_{0.41}F_{0.26})_{\Sigma=2.00}$.

Mineral Group: Shcherbakovite group.

Occurrence: Lines the walls of cavities in alkaline syenite, also a rock-forming mineral in syenite.

Association: Potassic feldspar, kalsilite, aegirine, galena (Murun).

Distribution: From Liley [Löhley], Eifel Mountains, Germany; from Murun, Siberia, Russia, and near the Noonkanbah sheep station, Wolgidee Hills, West Kimberley District, Australia.

Name: For *Noonkanbah* sheep station, Wolgidee Hills, West Kimberley District, Australia, near the locality that produced the first specimens.

Type Material: Royal Ontario Museum, Department of Earth Sciences, Toronto, Canada (M54065).

References: (1) Uvarova, Y.A., E. Sokolova, F.C. Hawthorne, R.P. Liferovich, R.H. Mitchell, I.V. Pekov, and A.E. Zadov (2010) Noonkanbahite, $BaKNaTi_2(Si_4O_{12})O_2$, a new mineral species: description and crystal structure. Mineral. Mag., 74(3), 441-450. (2) (2011) Amer. Mineral., 96, 1657 (abs. ref. 1).