

Bobshannonite **$\text{Na}_2\text{KBa}(\text{Mn,Na})_8(\text{Nb,Ti})_4(\text{Si}_2\text{O}_7)_4\text{O}_4(\text{OH})_4(\text{O,F})_2$**

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As blocky crystals, to 1.0 mm.
Twinning: Extensively twinned (seen in X-ray analysis) by an undetermined twin law.

Physical Properties: *Cleavage:* Very good on {001}. *Fracture:* Hackly. *Tenacity:* Brittle.
 Hardness = ~ 4 D(meas.) = n.d. D(calc.) = 3.787

Optical Properties: Transparent to translucent. *Color:* Orange-brown. *Streak:* Very pale brown.
Luster: Vitreous to frosted.
Optical Class: n.d. (Due to extensive twinning.)

Cell Data: *Space Group:* $C\bar{1}$. $a = 10.839(6)$ $b = 13.912(8)$ $c = 20.98(1)$ $\alpha = 89.99(1)^\circ$
 $\beta = 95.05(2)^\circ$ $\gamma = 89.998(9)^\circ$ $Z = 4$

X-ray Powder Pattern: Poudrette quarry, Mont Saint-Hilaire, Monterégie, Québec, Canada.
 2.873 (100), 3.477 (60), 3.193 (59), 2.648 (40), 2.608 (35), 1.776 (30), 1.733 (28)

Chemistry:	(1)		(1)
Ta ₂ O ₅	0.52	MnO	26.34
Nb ₂ O ₅	19.69	MgO	0.06
TiO ₂	5.50	Rb ₂ O	0.42
SiO ₂	26.31	K ₂ O	2.38
Al ₂ O ₃	0.06	Na ₂ O	4.05
BaO	7.92	F	0.70
ZnO	1.02	H ₂ O	[1.96]
FeO	0.89	- O = F ₂	0.29
		Total	97.53

(1) Poudrette quarry, Mont Saint-Hilaire, Québec, Canada; average of 9 electron microprobe analyses, supplemented by FTIR and Raman spectroscopy, H₂O calculated from structure analysis; corresponding to $\text{Na}_{1.89}(\text{K}_{0.93}\text{Rb}_{0.08})_{\Sigma=1.01}\text{Ba}_{0.95}(\text{Mn}_{6.85}\text{Na}_{0.52}\text{Zn}_{0.23}\text{Fe}_{0.23}^{2+}\text{Mg}_{0.03}\text{Al}_{0.02})_{\Sigma=7.88}(\text{Nb}_{2.73}\text{Ti}_{1.27}\text{Ta}_{0.04})_{\Sigma=4.04}(\text{Si}_{8.07}\text{O}_{28})\text{O}_{9.32}\text{H}_{4.01}\text{F}_{0.68}$.

Occurrence: A hydrothermal phase in a pegmatite associated with an intrusive alkaline gabbro-syenite complex.

Association: Sérandite, albite, aegirine, epididymite, catapleiite, kupletskite, rhodochrosite, rhabdophane-(Ce).

Distribution: From the Poudrette quarry, Mont Saint-Hilaire, La Vallée-du-Richelieu RCM, Monterégie, Québec, Canada.

Name: Honors Dr. Robert (Bob) D. Shannon (b. 1935) from Boulder, Colorado, USA, for his contributions to crystal chemistry and mineralogy through his development of accurate and comprehensive ionic radii and his work on dielectric properties.

Type Material: Canadian Museum of Nature, Ottawa, Ontario, Canada (CMNMC 86886).

References: (1) Sokolova, E., F. Cámara, Y.A. Abdu, F.C. Hawthorne, L. Horváth and E. Pfenninger-Horváth (2015) Bobshannonite, $\text{Na}_2\text{KBa}(\text{Mn,Na})_8(\text{Nb,Ti})_4(\text{Si}_2\text{O}_7)_4\text{O}_4(\text{OH})_4(\text{O,F})_2$, a new TS-block mineral from Mont Saint-Hilaire, Québec, Canada: Description and crystal structure. *Mineral. Mag.*, 79(7), 1791-1811. (2) (2016) *Amer. Mineral.*, 101, 2124-2125 (abs. ref. 1).