Bobtraillite $(Na,Ca)_{13}Sr_{11}(Zr,Y,Nb)_{14}Si_{42}B_6O_{132}(OH)_{12}\cdot 12H_2O$

Crystal Data: Hexagonal. *Point Group*: $\bar{3}$ 2/*m*. As blocky to prismatic crystals, elongated along [001] and exhibiting {100} and {001}, to 2 mm, as parallel 2- to 3-member aggregates and rosettes; rarely as plates, flattened along [001].

Physical Properties: *Cleavage*: None. *Fracture*: Uneven to conchoidal. *Tenacity*: Brittle. Hardness = 5.5 D(meas.) = n.d. D(calc.) = 3.16

Optical Properties: Transparent. *Color*: Gray to pale green or brown, rarely black. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (+). ω = 1.627(1) ε = 1.645(1) *Pleochroism*: None.

Cell Data: *Space Group*: $P\bar{3}c_1$. a =19.720(1) c = 9.9788(5) Z = 1

X-ray Powder Pattern: Mont Saint-Hilaire, Quebec, Canada [also a calculated peak at 17.08 (44)]. 2.752 (100), 3.13 (70), 3.96 (51), 3.76 (49), 6.46 (38), 5.43 (33), 1.990 (27)

Chemistry:

	(1)
Na_2O	5.62
CaO	1.11
SrO	17.76
BaO	0.40
$[B_2O_3]$	3.38
Y_2O_3	1.15
SiO_2	40.51
ZrO_2	25.32
HfO_2	0.48
Nb_2O_5	1.32
$[H_2O]$	5.25
Total	102.30

(1) Poudrette quarry, Mont Saint-Hilaire, Quebec, Canada; average of 7 electron microprobe analyses, H_2O calculated and confirmed by IR spectroscopy, B from structural analysis; corresponding to $(Na_{11.20}Ca_{1.22})_{\Sigma=12.42}(Sr_{10.59}Ba_{0.16})_{\Sigma=10.75}(Zr_{12.69}Y_{0.63}Nb_{0.61}Hf_{0.14})_{\Sigma=14.07}Si_{41.64}B_6O_{132}(OH)_{12}\cdot 12H_2O$.

Occurrence: A late hydrothermal mineral in cavities in igneous breccia and nepheline syenite pegmatite.

Association: An unnamed burbankite-group mineral, donnayite-(Y), clinoamphibole, albite, aegirine, pyrrhotite, pyrite, annite, analcime, microcline, a white mica (muscovite?), titanite, clinopyroxene, calcite.

Distribution: Poudrette quarry, Mont Saint-Hilaire, Rouville County, Quebec, Canada.

Name: Honors Dr. Robert ("Bob") James Traill (b. 1921), mineralogist and former head of the Mineralogy Section at the Geological Survey of Canada, Ottawa (1953-1986).

Type Material: Canadian Museum of Nature, Ottawa, Canada (CMNMC 83718).

References: (1) McDonald, A.M. and G.Y. Chao (2005) Bobtraillite, $(Na,Ca)_{13}Sr_{11}(Zr,Y,Nb)_{14}Si_{42}B_6O_{132}(OH)_{12}\cdot 12H_2O$, a new mineral species from Mont Saint-Hilaire, Quebec: Description, structure determination and relationship to benitoite and wadeite. Can. Mineral., 43, 747-758. (2) (2005) Amer. Mineral., 90, 1945 (abs. ref. 1).