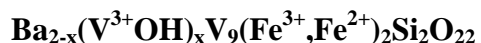


Greenwoodite

Crystal Data: Hexagonal. *Point Group:* 3m. As semi-prismatic to tabular grains, to 200 μm .

Physical Properties: *Cleavage:* Perfect on {001}. *Fracture:* n.d. *Tenacity:* n.d. *Hardness* = 5
D(meas.) = n.d. D(calc.) = 4.81

Optical Properties: Opaque. *Color:* Black, gray with a weak brownish tint in reflected light.
Streak: n.d. *Luster:* Semi-metallic, dull.

Optical Class: n.d. Distinct birefractance, pleochroism, and anisotropism.

R_1 - R_2 : (470) 12.5-15.75 (2.82-4.83)_{oil}, (546) 12.63-15.50 (2.98-4.80)_{oil}, (589) 12.81-15.75
(3.31-4.95)_{oil}, (650) 13.60-16.22 (3.57-5.28)_{oil}

Cell Data: *Space Group:* P3m1. $a = 5.750(1)$ $c = 14.459(1)$ $Z = 1$

X-ray Powder Pattern: Calculated pattern.

2.925 (100), 2.875 (38), 2.469 (35), 1.438 (35), 2.354 (28), 2.212 (28), 1.669 (26)

Chemistry:	(1)
MgO	0.12
Al ₂ O ₃	0.91
SiO ₂	8.63
TiO ₂	1.05
V ₂ O ₃	58.03
Cr ₂ O ₃	1.42
MnO	0.11
FeO	[3.72]
Fe ₂ O ₃	[9.1]
ZnO	1.52
BaO	15.13
<u>H₂O</u>	<u>[0.62]</u>
Total	100.36

(1) Wigwam deposit, British Columbia, Canada; average of 13 electron microprobe analyses, Fe⁺²/Fe⁺³ calculated from charge balance, H₂O determined by crystal structure analysis; corresponding to Ba_{0.60}(V³⁺OH)_{0.40}(V³⁺_{8.33}Cr_{0.33}Ti_{0.13}Al_{0.13}Mn³⁺_{0.02}) $\Sigma=9$
(Fe³⁺_{1.08}Fe²⁺_{0.60}Zn_{0.22}Al_{0.06}Mg_{0.04}) $\Sigma=2$ (Si_{1.72}Fe³⁺_{0.28}) $\Sigma=2$ O₂₂.

Occurrence: Part of the prograde assemblage in a green schist facies metamorphosed Mississippi-Valley type base-metal deposit.

Association: Quartz, celsian, apatite, sphalerite, pyrrhotite, galena, pyrite, zoltaiite, batisivite.

Distribution: At the Wigwam deposit, Akolkolex River area, southeast of Revelstoke, British Columbia, Canada.

Name: Honors Professor Hugh J. Greenwood (b. 1931), former head of the Geological Sciences Department, University of British Columbia, Vancouver, British Columbia, Canada, for his contributions to petrology.

Type Material: American Museum of Natural History, New York, New York, USA (109839).

References: (1) Bartholomew, P.R., F. Mancini, G.E. Harlow, N. Deifel, C. Cahill, and H.-J. Bernhardt (2012) Greenwoodite, a new nesosilicate from British Columbia with a Ba-VOH coupled substitution and tetrahedral Fe; description and structure. *Can. Mineral.*, 50, 1233-1242.

(2) (2014) *Amer. Mineral.*, 99, 1514-1515 (abs. ref. 1).