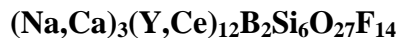


Okanoganite-(Y)

Crystal Data: Hexagonal. *Point Group:* 3m. As twinned pseudotetrahedral crystals, to 4 mm, and groups of such crystals. *Twinning:* With twin plane (0114), producing fourlings, the (0001) face of each individual crystal forming the faces of a pseudotetrahedron.

Physical Properties: Hardness = 4 D(meas.) = 4.35(4) D(calc.) = 4.96

Optical Properties: Transparent to translucent. *Color:* Tan to pale pink; colorless in thin fragments. *Streak:* White.

Optical Class: Uniaxial (-). $\omega = 1.753(2)$ $\epsilon = 1.740(2)$

Cell Data: Space Group: *R3m*. $a = 10.7108(5)$ $c = 27.0398(11)$ $Z = 3$

X-ray Powder Pattern: Golden Horn batholith, Washington, USA.
2.970 (100), 2.939 (95), 2.926 (50), 3.11 (48), 1.784 (43), 4.35 (41), 1.978 (35)

Chemistry:	(1)
SiO ₂	14.35
TiO ₂	0.50
B ₂ O ₃	3.1
Y ₂ O ₃	20.46
RE ₂ O ₃	44.29
FeO	1.60
PbO	0.63
CaO	3.24
Na ₂ O	2.74
F	11.15
<u>-O = F₂</u>	<u>4.69</u>
Total	97.37

(1) Golden Horn batholith, Washington, USA; by electron microprobe, B by spectrophotometer, RE₂O₃ = La₂O₃ 5.88%, Ce₂O₃ 15.42%, Pr₂O₃ 1.83%, Nd₂O₃ 7.70%, Sm₂O₃ 1.64%, Gd₂O₃ 5.28%, Tb₂O₃ 0.44%, Dy₂O₃ 2.08%, Ho₂O₃ 0.96%, Er₂O₃ 1.26%, Tm₂O₃ 0.20%, Yb₂O₃ 0.79%, Lu₂O₃ 0.81%; corresponds to (Na_{2.13}Ca_{0.80}Pb_{0.07}) $\Sigma=3.00$ [(Y,RE)_{10.64}Ca_{0.59}Fe_{0.54}] $\Sigma=11.77$ B_{2.15}(Si_{5.76}Ti_{0.15}) $\Sigma=5.91$ O₂₇F_{14.15}.

Occurrence: In miarolitic cavities in a peralkalic arfvedsonite-bearing granite.

Association: Quartz, microcline, zircon, arfvedsonite, bastnäsite, zektzerite, astrophyllite.

Distribution: From the Golden Horn batholith, near Washington Pass, Okanogan Co., Washington, USA.

Name: For Okanogan Co., Washington, USA, and the yttrium content.

Type Material: National Museum of Natural History, Washington, D.C., USA; 142512-142514.

References: (1) Boggs, R. (1980) Okanoganite, a new rare-earth borofluorosilicate from the Golden Horn batholith, Okanogan County, Washington. *Amer. Mineral.*, 65, 1138-1142.
(2) Boiocchi, M., A. Callegari, L. Ottolini, and A. Maras (2004) The chemistry and crystal structure of okanoganite-(Y) and comparison with vicanite-(Ce). *Amer. Mineral.*, 89, 1540-1545.
(3) (2005) *Amer. Mineral.*, 90, 772-773 (abs. ref. 2).