

Bussyite-(Ce)

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals, prismatic on [101], to 10 mm, exhibiting forms {1 1 $\bar{1}$ }, {1 0 $\bar{1}$ }; as crystal sprays. *Twining:* Fine lamellar, parallel elongation.

Physical Properties: *Cleavage:* Perfect on {1 0 $\bar{1}$ }. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 4 D(meas.) = 3.00. D(calc.) = 3.11

Optical Properties: Transparent to translucent. *Color:* Pale pinkish orange. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.574(2)$ $\beta = 1.591(2)$ $\gamma = 1.597(2)$ $2V(\text{meas.}) = 63(2)^\circ$ $2V(\text{calc.}) = 61^\circ$ *Orientation:* X \wedge c = 39° (β acute); Y = b; Z \wedge a = 44.5° (β obtuse).

Cell Data: *Space Group:* C2/c. a = 11.654(3) b = 13.916(3) c = 16.583(4) $\beta = 95.86(2)^\circ$ Z = 4

X-ray Powder Pattern: Poudrette dike, Mont Saint-Hilaire, Quebec, Canada. 8.120 (100), 2.863 (48), 3.543 (39), 2.668 (33), 6.959 (26), 2.959 (24), 2.749 (23)

Chemistry:	(1)		(2)
Na ₂ O	7.63	Sm ₂ O ₃	0.99
K ₂ O	0.05	Gd ₂ O ₃	1.03
BeO	8.33	Er ₂ O ₃	0.01
CaO	5.35	Yb ₂ O ₃	1.97
MgO	0.03	SiO ₂	38.66
MnO	2.49	ThO ₂	3.31
Al ₂ O ₃	0.82	F	3.67
Y ₂ O ₃	1.97	S	0.03
La ₂ O ₃	2.65	H ₂ O	4.12
Ce ₂ O ₃	9.77	-O=F	1.55
Pr ₂ O ₃	1.23	<u>-O=S</u>	<u>0.01</u>
Nd ₂ O ₃	4.54	Total	95.21

(1) Poudrette dike, Mont Saint-Hilaire, Quebec, Canada; average of 26 electron microprobe analyses, H₂O calculated from structural analysis, IR confirms OH and H₂O, corresponding to (Ce_{0.823}Nd_{0.373}Y_{0.242}Th_{0.173}Pr_{0.103}Sm_{0.079}Gd_{0.078}Eu_{0.008}) $\Sigma=1.89$ (Ca_{0.775}La_{0.225}) $\Sigma=1$ [Na_{3.000}(H₂O)_{2.500}Ca_{0.544}K_{0.015}] $\Sigma=6.055$ (Mn_{0.485}Na_{0.402}Mg_{0.012}) $\Sigma=0.899$ (Si_{8.897}Be_{4.605}Al_{0.222}) $\Sigma=13.724$ O₃₀[F_{2.67}(OH)_{1.33}] $\Sigma=4$.

Occurrence: A late-stage hydrothermal mineral associated with a nepheline syenite-hosted pegmatite.

Association: Serandite, aegirine, albite, analcime, ancylite-(Ce), calcite, catapleiite, gonnardite, kupletskite, leucophanite, microcline, nenadkevichite, polyolithionite, sphalerite.

Distribution: Poudrette pegmatite dike, Mont Saint-Hilaire, Quebec, Canada.

Name: Honors Antoine Alexandre Brutus Bussy (1794-1882), co-discoverer of beryllium.

Type Material: Canadian Museum of Nature, Ottawa, Ontario, Canada (catalog no. CMNMC 85929).

References: (1) Grice, J.D., R. Rowe, G. Poirier, A. Pratt, and J. Francis (2009) Bussyite-(Ce), a new beryllium silicate mineral species from Mont Saint-Hilaire, Quebec. *Can. Mineral.*, 47, 193–204. (2) (2009) *Amer. Mineral.*, 94, 1496 (abs. ref. 1).