

Calcioburbankite**Na₃(Ca, Ce, Sr, La)₃(CO₃)₅**

Crystal Data: Hexagonal. *Point Group:* 6mm. As imperfect prismatic crystals elongated along [0001], to 2 cm, with dominant {1010}; also, as equant crystals with {1010} and {0001} and fibrous terminations.

Physical Properties: *Cleavage:* Indistinct on {1010}. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 3-4 D(meas.) = 3.45(3) D(calc.) = 3.46

Optical Properties: Translucent. *Color:* Bright orange, pale pink. *Streak:* White. *Luster:* Vitreous, silky.

Optical Class: Uniaxial (-). $\omega = 1.636(1)$ $\varepsilon = 1.631(1)$

Cell Data: *Space Group:* P6₃mc. $a = 10.447(3)$ $c = 6.318(3)$ $Z = 2$

X-ray Powder Pattern: Mont Saint-Hilaire, Canada.

2.601 (10), 2.130 (6), 3.01 (5), 2.509 (5), 1.793 (5), 1.674 (5), 1.613 (5)

Chemistry:	(1)
CO ₂	[35.13]
La ₂ O ₃	9.30
Ce ₂ O ₃	14.38
Pr ₂ O ₃	1.26
Nd ₂ O ₃	3.76
Sm ₂ O ₃	0.48
CaO	11.81
SrO	7.65
BaO	0.46
Na ₂ O	15.17
Total	[99.40]

(1) Mont Saint-Hilaire, Canada; by electron microprobe, CO₂ calculated from stoichiometry, absence of (OH)¹⁻ and H₂O confirmed by IR; corresponds to Na_{3.07}(Ca_{1.32}Ce_{0.55}Sr_{0.46}La_{0.36}Nd_{0.14}Pr_{0.05}Sm_{0.02}Ba_{0.02}) $\Sigma=2.92$ (CO₃)₅.

Occurrence: A rare late stage mineral associated with an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire).

Association: Ancylyte-(Ce), calcite, donnayite-(Y), fluorapatite, natrolite, pyrite, rhodochrosite, rutile, "chlorite" (vent or altered pegmatite); aegirine, calcite, fluorite, galena, leucophanite, manganese, neptunite, microcline, molybdenite-2H and -3R, narsarsukite, pectolite, pyrite, schairerite, shortite, sodalite, sphalerite, thermonatrite, titanite (marble xenoliths).

Distribution: From Mont Saint-Hilaire, Quebec, Canada. From the Vuoriyarvi carbonatites, northern Karelia, Russia.

Name: The calcium analog of *burbankite*.

Type Material: Canadian Museum of Nature, Ottawa, Canada, 50804.

References: (1) Van Velthuisen, J., R.A. Gault, and J.D. Grice (1995) Calcioburbankite, Na₃(Ca, REE, Sr)₃(CO₃)₅, a new mineral species from Mont Saint-Hilaire, Quebec, and its relationship to the burbankite group of minerals. *Can. Mineral.*, 33, 1231-1235. (2) (1996) *Amer. Mineral.*, 81, 1013 (abs. ref. 1). (3) Belovitskaya, Yu.V., I.V. Pekov, E.R. Gobechiya, Yu.K. Kabalov, and V.V. Subotin (2001) Crystal structure of calcioburbankite and the characteristic features of the burbankite structure type. *Crystallogr. Reports*, 46, 929-937. (4) (2003) *Amer. Mineral.*, 88, 934 (abs. ref. 3). (5) Zaitsev, A.N., A. Demény, S. Sindern, and F. Wall (2002) Burbankite group minerals and their alteration in rare earth carbonatites - source of elements and fluids (evidence from C-O and Sr-Nd isotopic data). *Lithos*, 62, 15-33.