

Petersenite-(Ce)**Na₄(Ce, La, Nd)₂(CO₃)₅**

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Crystal Data: Monoclinic, pseudohexagonal. *Point Group:* 2. Crystals are prismatic to acicular, to 7 mm, typically in parallel aggregates.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Very brittle. *Hardness* = ~3
D(meas.) = 3.69(3) D(calc.) = 3.67

Optical Properties: Transparent to translucent. *Color:* Gray with a pinkish tint, yellow, mauve. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (+) or (-). *Orientation:* $X = b$; $Z = a$; $Y \wedge c = 30^\circ$. *Dispersion:* Moderate. $\alpha = 1.623(1)$ $\beta = 1.636(1)$ $\gamma = 1.649(1)$ $2V(\text{meas.}) = 89.7^\circ\text{--}90^\circ$
 $2V(\text{calc.}) = 89.8^\circ$

Cell Data: *Space Group:* $P2_1$. $a = 20.872\text{--}20.89$ $b = 6.338\text{--}6.367$ $c = 10.60\text{--}10.601$
 $\beta = 120.50^\circ\text{--}120.8^\circ$ $Z = 4$

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

2.607 (10), 5.22 (5), 3.70 (4), 9.13 (3), 4.13 (3), 2.148 (3), 1.921 (3)

Chemistry:	(1)	(2)		(1)	(2)
CO ₂	[32.92]	[33.69]	Sm ₂ O ₃	0.60	0.39
ThO ₂		0.78	CaO	1.32	5.52
Y ₂ O ₃		0.04	SrO	1.70	4.10
La ₂ O ₃	14.49	11.97	BaO	0.32	0.42
Ce ₂ O ₃	23.66	17.80	Na ₂ O	17.38	17.51
Pr ₂ O ₃	2.00	1.54			
Nd ₂ O ₃	5.82	5.20	Total	[100.21]	[98.96]

(1) Mont Saint-Hilaire, Canada; by electron microprobe, average of analyses on three grains, CO₂ calculated from crystal-structure analysis; corresponds to (Na_{3.75}Ca_{0.16}) $_{\Sigma=3.91}$ (Ce_{0.96}La_{0.59}Nd_{0.23}Sr_{0.11}Pr_{0.08}Sm_{0.02}Ba_{0.01}) $_{\Sigma=2.00}$ (CO₃)₅. (2) Mt. Koashva, Kola Peninsula, Russia; by electron microprobe, CO₂ calculated for stoichiometry; corresponds to (Na_{3.70}Ca_{0.30}) $_{\Sigma=4.00}$ (Ce_{0.71}La_{0.48}Ca_{0.34}Sr_{0.25}Nd_{0.20}Pr_{0.06}Th_{0.02}Ba_{0.02}Sm_{0.01}) $_{\Sigma=2.09}$ (CO₃)₅.

Occurrence: A rare component in pegmatites in nepheline–sodalite syenite near a contact with a hornfels unit, associated with an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada); in the core of a large pegmatite in a differentiated alkalic massif (Mt. Koashva, Kola Peninsula, Russia).

Association: Aegirine, albite, microcline, “biotite”, “chlorite”, polyolithionite, calcite, rhodochrosite, analcime, catapleiite, epididymite, eudialyte, serandite, fluorite, galena, sphalerite, trona, shomiokite-(Y), adamsite-(Y) (Mont Saint-Hilaire, Canada); aegirine, nacaphite, vitusite-(Ce), pectolite, thermonatrite, lomonosovite, sazykinaite-(Y) (Mt. Koashva, Kola Peninsula, Russia).

Distribution: From Mont Saint-Hilaire, Quebec, Canada. On Mt. Koashva, Khibiny massif, Kola Peninsula, Russia.

Name: To honor Dr. Ole Valdemar Petersen (1939–), Curator, Geology Museum, Copenhagen, Denmark, for his work on the mineralogy of alkaline rocks.

Type Material: Canadian Museum of Nature, Ottawa, Canada, 81511.

References: (1) Grice, J.D., J. Van Velthuisen, and R.A. Gault (1994) Petersenite-(Ce), a new mineral from Mont Saint-Hilaire, and its structural relationship to other REE carbonates. *Can. Mineral.*, 32, 405–414. (2) (1995) *Amer. Mineral.*, 80, 406 (abs. ref. 1). (3) Pekov, I.V., N.V. Chukanov, and Y.V. Belovitskaya (1998) Khanneshite and petersenite-(Ce) from the Khibiny massif. *Zap. Vses. Mineral. Obshch.*, 127(2), 92–100 (in Russian with English abs.).

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