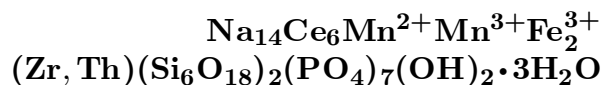


## Steenstrupine-(Ce)



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**Crystal Data:** Hexagonal; commonly metamict. *Point Group:*  $\bar{3} 2/m$ . Rhombohedral crystals, rounded and rough, to 10 cm; massive.

**Physical Properties:** *Fracture:* Conchoidal. *Hardness* = 4–5 *D*(meas.) = 3.38–3.47. *D*(calc.) = [3.63] *Radioactive.*

**Optical Properties:** Opaque. *Color:* Brownish red to black. *Streak:* Brownish, nearly white. *Luster:* Dull.

*Optical Class:* Uniaxial (-). *Pleochroism:* Weak, in brown and yellow tints.  $\omega = 1.665$ – $1.667$   $\epsilon = 1.662$ – $1.663$

**Cell Data:** *Space Group:*  $R\bar{3}m$ .  $a = 10.460(4)$   $c = 45.479(15)$   $Z = 3$

**X-ray Powder Pattern:** Ilímaussaq intrusion, Greenland.

3.27 (10), 2.60 (9), 3.17 (8), 2.74 (8), 15.14 (6), 3.04 (5), 2.88 (5)

<b>Chemistry:</b>	(1)	(2)		(1)	(2)
SiO <sub>2</sub>	26.72	22.95	MnO	6.60	2.26
ZrO <sub>2</sub>		3.92	MgO	0.31	
ThO <sub>2</sub>	2.13		CaO	2.33	
Y <sub>2</sub> O <sub>3</sub>	0.36		Na <sub>2</sub> O	11.23	13.81
(Ce, La) <sub>2</sub> O <sub>3</sub>	29.60	31.36	H <sub>2</sub> O	3.45	2.29
Fe <sub>2</sub> O <sub>3</sub>	2.67	5.08	P <sub>2</sub> O <sub>5</sub>	8.19	15.82
Mn <sub>2</sub> O <sub>3</sub>		2.51	F	1.24	
Nb <sub>2</sub> O <sub>5</sub>	4.37		–O = F <sub>2</sub>	0.52	
			Total	98.68	100.00

(1) Julianehåb, Greenland. (2) Na<sub>14</sub>Ce<sub>6</sub>Mn<sup>2+</sup>Mn<sup>3+</sup>Fe<sub>2</sub><sup>3+</sup>Zr(Si<sub>6</sub>O<sub>18</sub>)<sub>2</sub>(PO<sub>4</sub>)<sub>7</sub>(OH)<sub>2</sub>•3H<sub>2</sub>O.

**Occurrence:** In ultra-agpaitic pegmatites of nepheline-sodalite syenites and syenites.

**Association:** Lepidolite, aegirine, murmanite, ussingite, natrolite, nordite, nepheline, sodalite.

**Distribution:** From the Kangerdluarssuk Plateau and elsewhere in the Ilímaussaq intrusion, southern Greenland. In the Lovozero massif, Kola Peninsula, Russia. At Mont Saint-Hilaire, Quebec, Canada.

**Name:** For Knud Johannes Vogelius Steenstrup (1842–1913), Danish geologist of Copenhagen, Denmark.

**Type Material:** University of Copenhagen, Copenhagen, Denmark, 1881.1070.

**References:** (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 415. (2) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 321–324. (3) Makovicky, E. and S. Karup-Møller (1981) Crystalline steenstrupine from Tunugdliarfik in the Ilímaussaq alkaline intrusion, South Greenland. Neues Jahrb. Mineral., Abh., 140, 300–330. (4) Moore, P.B. and J. Shen (1983) Crystal structure of steenstrupine: a rod structure of unusual complexity. Tschermaks Mineral. Petrog. Mitt., 31, 47–67.