

Steacyite

$K_{1-x}(\text{Na}, \text{Ca})_2\text{ThSi}_8\text{O}_{20}$ ($x = 0.2$ to 0.4)

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Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. As crystals elongated || [001], terminated by {100} and {001}, to 2 mm; radiating crystalline; massive. *Twinning:* Cruciform, by 90° rotation about [010].

Physical Properties: *Tenacity:* Brittle. Hardness = 5 D(meas.) = 2.95, on porous material. D(calc.) = 3.32 Radioactive, emitting α and β particles, but not γ radiation.

Optical Properties: Translucent to transparent in thin section. *Color:* Dark brown, green, yellow. *Streak:* White. *Luster:* Vitreous.

Optical Class: Uniaxial (-). $\omega = 1.573(1)$ $\epsilon = 1.572(1)$

Cell Data: *Space Group:* $P4/mcc$. $a = 7.58(1)$ $c = 14.77(2)$ $Z = 2$

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

3.38 (100), 3.32 (55), 5.30 (45), 2.64 (41), 2.00 (26), 1.82 (20), 2.16 (19)

Chemistry:	(1)	(2)		(1)	(2)
SiO ₂	57.92	52.12	MgO	0.17	
ThO ₂	28.03	30.08	CaO	4.92	4.38
UO ₂	0.00	0.14	Na ₂ O	3.36	3.96
RE ₂ O ₃	0.47	1.81	K ₂ O	3.42	4.42
Fe ₂ O ₃	0.00		F		0.23
As ₂ O ₃		0.45	H ₂ O	0.00	
MnO	1.64		P ₂ O ₅		0.02
PbO	0.07		-O = F ₂		0.10
			Total	100.00	[97.51]

(1) Mont Saint-Hilaire, Canada; corresponds to $K_{0.61}(\text{Na}_{0.73}\text{Ca}_{0.72}\text{Mn}_{0.19}\text{Mg}_{0.03})_{\Sigma=1.67}(\text{Th}_{0.88}\text{Pb}_{0.01})_{\Sigma=0.89}\text{Si}_8\text{O}_{19.56}$. (2) Rouma Isle, Guinea; RE₂O₃ = La₂O₃ 0.37%, Ce₂O₃ 0.95%, Pr₂O₃ 0.02%, Nd₂O₃ 0.38%, Sm₂O₃ 0.09%, original total given as 97.61%; corresponds to $K_{0.86}(\text{Na}_{1.17}\text{Ca}_{0.72}\text{RE}_{0.10})_{\Sigma=1.99}(\text{Th}_{1.04}\text{U}_{0.05})_{\Sigma=1.09}(\text{Si}_{7.92}\text{As}_{0.04})_{\Sigma=7.96}\text{O}_{20}$.

Occurrence: In cavities in pegmatite veins in nepheline syenite in an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada); in a miarolitic cavity in nepheline syenite (Rouma Isle, Guinea); in quartz-albite-aegirine veinlets and in albitites in syenites (Dara-i-Pioz massif, Tajikistan).

Association: Nenadkevichite, analcime, aegirine (Mont Saint-Hilaire, Canada); arfvedsonite, astrophyllite, catapleiite, eudialyte, sérandite, villiaumite (Rouma Isle, Guinea); baratovite, miserite, titanite (Dara-i-Pioz massif, Tajikistan).

Distribution: From Mont Saint-Hilaire, Quebec, Canada. On Rouma Isle, Los Islands, Guinea. In the Dara-i-Pioz massif, Alai Range, Tien Shan, Tajikistan.

Name: For Harold R. Steacy, formerly Curator of the National Mineral Collection, Geological Survey of Canada, Ottawa, Canada.

Type Material: École Polytechnique, Montreal, 12480; Canadian Geological Survey, Ottawa, 61529; Canadian Museum of Nature, Ottawa, Canada; National Museum of Natural History, Washington, D.C., USA, 149820; The Natural History Museum, London, England, 1970.168.

References: (1) Perrault, G. and J.T. Szymański (1982) Steacyite, a new name, and a re-evaluation of the nomenclature of “ekanite”-group minerals. *Can. Mineral.*, 20, 59–63. (2) (1983) *Amer. Mineral.*, 68, 472 (abs. ref. 1). (3) Richard, P. and G. Perrault (1972) Structure cristalline de l’ekanite [steacyite] de St-Hilaire, P.Q. *Acta Cryst.*, 28, 1994–1999 (in French). (4) Parodi, G.C. and G. Della Ventura (1987) Steacyite from the Rouma Isle (Los Islands, Republic of Guinea). *Neues Jahrb. Mineral., Monatsh.*, 233–239. (5) Mandarino, J.A. and V. Anderson (1989) *Monteregian Treasures*. Cambridge Univ. Press, 188–189.

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