Latrappite $(Ca, Na)(Nb, Ti, Fe)O_3$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As pseudocubic crystals, to 0.5 mm. *Twinning:* Commonly complexly twinned.

Physical Properties: Hardness = [5.5] (by analogy to the perovskite group).
D(meas.) = 4.40–4.42 D(calc.) = 4.457

Optical Properties: Opaque. *Color:* Black; dark grayish brown in transmitted light.
Luster: [Adamantine.]
Optical Class: Biaxial. *Anisotropism:* Moderate.
R_1–R_2: n.d.

Cell Data: *Space Group: Pcmn.* $a = 5.448$ $b = 7.777$ $c = 5.553$ Z = [4]

X-ray Powder Pattern: Oka complex, Canada.
2.744 (100), 3.887 (79), 1.942 (57), 2.773 (30), 1.579 (25), 1.595 (14), 1.737 (9)

Chemistry:

	(1)	(2)		(1)	(2)
U_3O_8		< 0.005	MnO	0.77	0.07
Nb_2O_5	43.90	50.35	PbO		0.01
Ta_2O_5		0.55	MgO	2.20	
V_2O_5		0.11	CaO	25.95	20.0
SiO_2	0.45	0.17	SrO		0.29
TiO_2	10.05	15.16	BaO		0.03
ZrO_2		0.85	Na_2O	4.03	6.77
ThO_2		trace	K_2O	0.03	0.09
Al_2O_3		0.08	H_2O^+		0.22
RE_2O_3	2.03	0.64	S	0.90	
Fe_2O_3	8.74	4.92	LOI (less S)	0.65	
FeO		0.44	Total	99.70	[100.75]

(1) Oka complex, Canada; total Fe as Fe_2O_3, after deduction of diopside and pyrite, corresponds to $(Ca_{0.75}Na_{0.21}RE_{0.02})_{\Sigma=0.98}(Nb_{0.54}Ti_{0.21}Fe_{0.16}Mg_{0.08}Mn_{0.02})_{\Sigma=1.01}O_3$.
(2) Badloch quarry, Germany; original total given as 100.65%; corresponds to $[Ca_{0.55}Na_{0.34}Fe_{0.01}(RE, Sr, K, Mn)_{0.02}]_{\Sigma=0.92}[Nb_{0.59}Ti_{0.29}Fe_{0.10}Zr_{0.01}(Ta, Si, Al, V)_{0.01}]_{\Sigma=1.00}O_3(OH)_{0.02}$.

Mineral Group: Perovskite group; $Ca_A > 0.5$; $Nb_B > 0.5$.

Occurrence: In sövite zones of carbonatite complexes.

Association: Calcite, apatite, diopside, biotite, pyrochlore, magnetite, niocalite, dolomite, nepheline, monticellite (Oka complex, Canada); columbite (Badloch quarry, Germany).

Distribution: From the St. Lawrence Columbium and Metals Corporation mine, near La Trappe, Quebec, Canada. Found in the Badloch quarry, in the Kaiserstuhl, Baden-Württemberg, Germany.

Name: For the small community, La Trappe, Quebec, Canada, near the mine from which the first crystals were recovered.

Type Material: Royal Ontario Museum, Toronto, Canada, M26143.

References: (1) Nickel, E.H. (1964) Latrappite – a proposed new name for the perovskite-type calcium niobate mineral from the Oka area of Quebec. Can. Mineral., 8, 121–122. (2) (1965) Amer. Mineral., 50, 265 (abs. ref. 1). (3) Nickel, E.H. and R.C. McAdam (1963) Niobian perovskite from Oka, Quebec; a new classification for minerals of the perovskite group. Can. Mineral., 7, 683–697. (4) Van Wambeke, L. (1980) Latrappite and ceriopyrochlore, new minerals for the Federal Republic of Germany. Neues Jahrb. Mineral., Monatsh., 171–174.