

Orthojoaquinite-(La)

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As masses of bent flakes, to 1 mm.

Physical Properties: *Cleavage:* Good on {001}. *Fracture:* n.d. *Tenacity:* n.d. *Hardness* = ~ 5 VHN = 350-430. *D(meas.)* = 4.1 *D(calc.)* = 4.14

Optical Properties: Transparent. *Color:* Brown. *Streak:* n.d. *Luster:* Silky.
Optical Class: Biaxial (+). $\alpha = 1.754$ $\beta = 1.760$ $\gamma = 1.797$ $2V(\text{meas.}) = 40^\circ$ $2V(\text{calc.}) = 45^\circ$
Pleochroism: Strong, yellow-green. *Absorption:* $Z > X$. *Orientation:* $Z = c$.

Cell Data: Space Group: *Ccmm* (probable). $a = 10.539(10)$ $b = 9.680(5)$ $c = 22.345(10)$ $Z = 4$

X-ray Powder Pattern: Ilímaussaq alkaline complex, Greenland.
 2.80 (100), 5.58 (68), 2.95 (17), 1.596 (13), 2.91 (10), 3.00 (9), 2.232 (8)

Chemistry:		(1)	(1)
Na ₂ O	2.41	Pr ₂ O ₃	[0.99]
K ₂ O	0.22	Nd ₂ O ₃	[2.15]
CaO (+SrO)	0.03	SiO ₂	33.82
MnO	0.70	TiO ₂	9.20
FeO	4.78	ThO ₂	0.38
BaO	21.46	Nb ₂ O ₅	2.31
Fe ₂ O ₃	0.39	H ₂ O	1.50
La ₂ O ₃	[10.05]	F	0.38
Ce ₂ O ₃	[9.40]	-O = F ₂	0.16
		Total	100.01

(1) Ilímaussaq alkaline complex, Greenland; wet chemical analysis, supplemented by IR spectroscopy, rare-earths calculated from total (REE)₂O₃; corresponds to (Ba_{1.99}Ca_{0.01}) $\Sigma=2.00$ (Na_{1.11}K_{0.07}) $\Sigma=1.18$ (La_{0.88}Ce_{0.81}Nd_{0.18}Pr_{0.09}) $\Sigma=1.96$ (Fe²⁺_{0.95}Mn_{0.14}) $\Sigma=1.09$ (Ti_{1.64}Nb_{0.25}Fe³⁺_{0.07}Th_{0.02}) $\Sigma=1.98$ Si_{8.01}O_{26.00}[(OH)_{0.37}O_{0.35}F_{0.28}] $\Sigma=1.00$ •1.00H₂O.

Polymorphism & Series: Dimorphous with joaquinite-(La).

Mineral Group: Joaquinite group.

Occurrence: In the intermediate zone of nepheline-sodalite syenite pegmatite in an alkaline igneous complex.

Association: Riebeckite, analcime, sodalite, steenstrupine-(Ce).

Distribution: From the Ilímaussaq alkaline complex, on the right bank of the Narsaq River at the foot of Kvanefjeld Mountain, south Greenland.

Name: An orthorhombic member of the *joaquinite* group with *La* as the dominant rare-earth element.

Type Material: n.d.

References: (1) Semenov, E.I., V.I. Bukin, Yu.A. Balashov, and H. Sørensen (1967) Rare earths in minerals of the joaquinite group. *Amer. Mineral.*, 52, 1762-1769. (2) Matsubara, S., J.A. Mandarino, and E.I. Semenov (2001) Redefinition of a mineral in the joaquinite group: orthojoaquinite-(La). *Can. Mineral.*, 39, 757-760. (3) (2002) *Amer. Mineral.*, 87, 355 (abs. ref. 2).