Synchysite-(Y) Ca(Y, Ce)(CO$_3$)$_2$F

Crystal Data: Monoclinic, pseudohexagonal. Point Group: 2/m. Crystals exhibit {1121} and {0001}, with smaller {1010}, {0221}, {3355}, {55103}, to 0.2 mm; typically in very fine-grained aggregates.

Physical Properties: Hardness = ∼4.5 D(meas.) = 3.9 D(calc.) = [3.88]


Cell Data: Space Group: C2/c. $a = 12.039(3)$ $b = 6.950(1)$ $c = 18.436(6)$ $\beta = 102.45(2)^\circ$ $Z = 12$

X-ray Powder Pattern: Cotopaxi, Colorado, USA. 1.89 (10), 2.00 (9), 1.83 (9), 1.37 (9), 2.75 (8), 3.47 (7), 1.26 (7)

Chemistry:

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\begin{array}{lll}
\text{CO}_2 & 31.4 & 29.98 \\
\text{Y}_2\text{O}_3 & 24. & 19.23 \\
\text{Ce}_2\text{O}_3 & 27.95 & \\
\text{RE}_2\text{O}_3 & [22.1] & \\
\text{CaO} & 18.5 & 19.10 \\
\text{F} & 5.7 & 6.47 \\
\text{-O} = \text{F}_2 & 2.4 & 2.73 \\
\text{Total} & [99.3] & 100.00
\end{array}
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(1) Near Cotopaxi, Colorado, USA: \text{RE}_2\text{O}_3 by difference, after deduction of kainosite 10.8% and \text{Fe}_2\text{O}_3 1%, corresponds to \text{Ca}_{1.0}(\text{Y}_{0.6}\text{RE}_{0.4})\Sigma_{1.0}(\text{CO}_3)_{2.0}\text{F}_{0.9}. (2) \text{Ca}(Y, Ce)(CO}_3\text{F with Y:Ce = 1:1.}

Occurrence: A rare hydrothermal accessory mineral in alkalic granites and granite pegmatites.

Association: Kainosite, bastnäsite, xenotime, hematite, quartz (Dover, New Jersey, USA).

Distribution: In the USA, from the Scrub Oaks iron mine, Mine Hill, 4 km west of Dover, Morris Co., New Jersey; at the Henry pegmatite, near Cotopaxi, Fremont Co., and the Big Bertha and White Cloud pegmatites, South Platte district, Jefferson Co., Colorado; from Rib Mountain, Marathon Co., Wisconsin. In the Evans-Lou quarry, near Wakefield, Quebec, Canada. Around Gallt y Wenallt, Gwynedd, Wales. On the west flank of Cherbadung [Pizzo Cervandone], Binotal, Valais, Switzerland. At Bad Grund, Harz Mountains, Germany. Crystallized in the Bantyshevo salt stock, Dnieper-Donets Basin, Ukraine. From the Jabal Sa’id pegmatite, central Saudi Arabia. At Xiaocaidan, Qinghai Province, China.

Name: For its relation to synchysite-(Ce) and dominant yttrium.

Type Material: n.d.