

Rustumite



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Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals crudely tabular on {100}, to 1 cm.
Twinning: Lamellar on {100}, twin axis [001], common.

Physical Properties: *Cleavage:* Poor on {100}, very poor on {010} and {001}.
Hardness = n.d. $D(\text{meas.}) = \text{n.d.}$ $D(\text{calc.}) = [2.94]$

Optical Properties: Translucent. *Color:* Colorless.
Optical Class: Biaxial (-). *Orientation:* $Y = b$; $X \wedge c = 4^\circ\text{--}6^\circ$. $\alpha = 1.640$ $\beta = \text{n.d.}$
 $\gamma = 1.651$ $2V(\text{meas.}) = 80^\circ$

Cell Data: *Space Group:* $C2/c$. $a = 7.62(5)$ $b = 18.55(5)$ $c = 15.51(5)$ $\beta = 104^\circ 20'(10)'$
 $Z = 4$

X-ray Powder Pattern: Kilchoan, Scotland.
3.03 (s1), 2.89 (s2), 3.19 (s3), 2.52 (ms), 1.907 (ms), 1.752 (ms), 2.75 (m)

Chemistry:	(1)	(2)
SiO ₂	33.8	32.16
CaO	61.6	60.03
Cl		7.59
H ₂ O		1.93
-O = Cl ₂		1.71
Total	95.4	100.00

(1) Kilchoan, Scotland; by electron microprobe, partial analysis; contains less than 0.2% Fe₂O₃, Al₂O₃, MgO, no CO₂; Cl not determined (later inferred during crystal structure determination, and independently confirmed). (2) Ca₁₀(SiO₄)(Si₂O₇)₂Cl₂(OH)₂.

Occurrence: In limestones between two ring dikes, formed during a metamorphic period in which H₂O:CO₂ in the vapor phase was relatively high (Kilchoan, Scotland).

Association: Åkermanite, merwinite, larnite, spurrite, rankinite, kilchoanite (Kilchoan, Scotland).

Distribution: In Scotland, from near Kilchoan, Ardnamurchan, Argyllshire. From Carlingford, Co. Louth, Ireland. In the Igeltjärn mine, near Persberg, Värmland, Sweden. From the Güneyce-İkizdere area, Trabzon Province, Turkey. In the La Negra mine, Maconi, Querétaro, Mexico.

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Type Material: National Museum of Natural History, Washington, D.C., USA, 119428, 119429.

References: (1) Agrell, S.O. (1965) Polythermal metamorphism of limestones at Kilchoan, Ardnamurchan. *Mineral. Mag.*, 34, 1–15. (2) (1965) *Amer. Mineral.*, 50, 2104 (abs. ref. 1). (3) Howie, R.A. and V.V. Ilyukhin (1977) Crystal structure of rustumite. *Nature*, 269, 231.