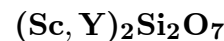


Thortveitite



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Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals typically prismatic along [110], to 35 cm. *Twinning:* Commonly twinned, axis $\perp$ {110}, composition plane {110}, rarely polysynthetically.

Physical Properties: *Cleavage:* Prismatic. *Fracture:* Uneven to conchoidal. *Tenacity:* Very brittle. Hardness = 6–7 $D(\text{meas.}) = 3.27\text{--}3.58$ $D(\text{calc.}) = [3.32]$

Optical Properties: Semitransparent. *Color:* Grayish green to black. *Luster:* Vitreous to subadamantine.

Optical Class: Biaxial (–). *Pleochroism:* $X = \text{deep green}$; $Y = Z = \text{brownish yellow}$ in thick grains. *Orientation:* $X \wedge c = 5^\circ$. *Absorption:* $X \geq Y = Z$. $\alpha = 1.750\text{--}1.756$ $\beta = 1.789\text{--}1.793$ $\gamma = 1.802\text{--}1.809$ $2V(\text{meas.}) = 65^\circ 30'$ $2V(\text{calc.}) = 60^\circ\text{--}65^\circ$

Cell Data: *Space Group:* $C2/m$. $a = 6.650(1)$ $b = 8.616(1)$ $c = 4.686(1)$
 $\beta = 102.20(1)^\circ$ $Z = 1$

X-ray Powder Pattern: Tuftane, Norway.

3.14 (100), 2.965 (65), 5.18 (60), 2.596 (50), 3.18 (45), 2.627 (30), 2.200 (25)

Chemistry:	(1)	(2)	(1)	(2)
SiO ₂	42.9	37.59	Fe ₂ O ₃	2.1
ZrO ₂		2.28	FeO	0.8
HfO ₂		0.55	MnO	0.67
Al ₂ O ₃		0.61	MgO	0.26
Sc ₂ O ₃	37.0	25.01	CaO	0.0
Y ₂ O ₃		17.73	LOI	0.4
RE ₂ O ₃	17.7	12.26	Total	100.9
				99.21

(1) Iveland, Norway. (2) Saetersdalen, Norway; by electron microprobe, RE₂O₃ = Dy₂O₃ 1.38%, Er₂O₃ 1.65%, Tm₂O₃ 0.54%, Yb₂O₃ 7.01%, Lu₂O₃ 1.68%; corresponds to (Sc_{1.13}Y_{0.49}RE_{0.20}Fe_{0.08}Zr_{0.06}Mn_{0.03}Mg_{0.02}Ca_{0.01}) $_{\Sigma=2.02}$ (Si_{1.95}Al_{0.04}) $_{\Sigma=1.99}$ O₇.

Occurrence: In granite pegmatite dikes (Norway).

Association: Euxenite, biotite, oligoclase, microcline, quartz (Iveland, Norway); monazite, fergusonite, ilmenorutile, beryl, muscovite, magnetite (Befanamo, Madagascar); kobeite, perrierite, tourmaline, euxenite, monazite, zircon, allanite, magnetite, ilmenite (Isanago mine, Japan).

Distribution: From a number of localities in Norway, including: in Iveland, at Saetersdalen, Ljosland, Frøysa, and Tuftane, near Frikstad; in Evje, at Flåt, Landverk, and Rampetrollsinken. At Befanamo, Madagascar. In Japan, in Kyoto Prefecture, in the Isanago mine, Oro, Nakagun, and at Shoroishi, Kobe, Omiya. From the Shilovo-Koneva massif, Ural Mountains, Russia. In the USA, from the Crystal Mountain fluorite mine, at Darby, Ravalli Co., Montana.

Name: For Olaus Thortveit, Norwegian mineralogist who discovered the mineral.

Type Material: n.d.

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