Thortveitite

\((\text{Sc, Y})_2\text{Si}_2\text{O}_7\)

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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.


Optical Properties: Semitransparent. Color: Grayish green to black. Luster: Vitreous to subadamantine. Optical Class: Biaxial (-). Pleochroism: X = deep green; Y = Z = brownish yellow in thick grains. Orientation: X \( \wedge Y = Z \). Absorption: X \( \gtrsim Y = Z \). \( \alpha = 1.750–1.756 \)  \( \beta = 1.789–1.793 \)  \( \gamma = 1.802–1.809 \)  2V(meas.) = 65°30'  2V(calc.) = 60°–65°

Cell Data: Space Group: \( \text{C}2/m \). \( a = 6.650(1) \)  \( b = 8.616(1) \)  \( c = 4.686(1) \)  \( \beta = 102.20(1)^\circ \)  \( Z = 1 \)

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:

\[
\begin{aligned}
\text{SiO}_2 & : 42.9 & \text{(1)} & 37.59 & \text{(2)} & \text{Fe}_2\text{O}_3 & : 2.1 & 2.06 \\
\text{ZrO}_2 & : 2.28 & \text{FeO} & : 0.8 \\
\text{HfO}_2 & : 0.55 & \text{MnO} & : 0.67 \\
\text{Al}_2\text{O}_3 & : 0.61 & \text{MgO} & : 0.26 \\
\text{Sc}_2\text{O}_3 & : 37.0 & \text{CaO} & : 0.0 & 0.19 \\
\text{Y}_2\text{O}_3 & : 17.73 & \text{LOI} & : 0.4 \\
\text{RE}_2\text{O}_3 & : 17.76 & \text{(Total) 100.9} & \text{99.21}
\end{aligned}
\]

(1) Iveland, Norway. (2) Saetersdalen, Norway; by electron microprobe, \( \text{RE}_2\text{O}_3 = \text{Dy}_2\text{O}_3 \) 1.38%, \( \text{Er}_2\text{O}_3 \) 1.65%, \( \text{Tm}_2\text{O}_3 \) 0.54%, \( \text{Yb}_2\text{O}_3 \) 7.01%, \( \text{Lu}_2\text{O}_3 \) 1.68%; corresponds to \((\text{Sc}_{1.13}\text{Y}_{0.49}\text{RE}_{0.20}\text{Fe}_{0.08}\text{Zr}_{0.06}\text{Mn}_{0.03}\text{Mg}_{0.02}\text{Ca}_{0.01})_2\text{Si}_{1.95}\text{Al}_{0.04}\)\). \( \Sigma = 1.00 \) 2V.

Occurrence: In granite pegmatite dikes (Norway).

Association: Euexenite, biotite, oligoclase, microcline, quartz (Iveland, Norway); monazite, fergusonite, ilmenorutile, beryl, muscovite, magnetite (Befanamo, Madagascar); koebeite, 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, Freysa, 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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