

Tveitite-(Y)

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Crystal Data: Hexagonal. *Point Group:* $\bar{3}$. Crystalline, massive. *Twinning:* Complex, polysynthetic, forming a three-dimensional grating of spindles, each of which is twinned internally in two directions.

Physical Properties: Hardness = n.d. D(meas.) = 3.94 D(calc.) = 3.99 Faint yellow-orange fluorescence under SW UV; dark blue cathodoluminescence.

Optical Properties: Transparent. *Color:* White to pale yellow. *Luster:* Greasy. *Optical Class:* Biaxial (-). $\alpha = 1.476$ $\beta = 1.479$ $\gamma = 1.481$ $2V(\text{meas.}) = 34^\circ$

Cell Data: *Space Group:* $R\bar{3}$. $a = 16.6920(9)$ $c = 9.6664(8)$ $Z = 3$

X-ray Powder Pattern: Høydalen, Norway.
3.184 (10), 1.265 (8), 1.949 (7), 1.664 (6), 2.764 (5), 1.963 (5), 3.222 (4)

Chemistry:	(1)	(2)
Y	22.2	24.39
RE	8.06	
U	0.05	
Fe	0.08	
Mn	0.02	
Ca	27.4	30.79
F	41.3	44.82
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Total	99.11	100.00

(1) Høydalen, Norway; RE = La 1.28%, Ce 3.86%, Pr 0.56%, Nd 0.90%, Sm 0.12%, Eu 0.04%, Gd 0.12%, Tb 0.03%, Dy 0.26%, Ho 0.05%, Er 0.17%, Tm 0.13%, Yb 0.35%, Lu 0.19%; corresponds to Ca_{13.89}(Y_{4.09}RE_{0.98}) $\Sigma=5.07$ F₄₃. (2) Ca₁₄Y₅F₄₃.

Occurrence: In a pegmatite dike in amphibolites, probably formed by inversion of yttrifluorite.

Association: Kainosite, fluocerite, cerianite, monazite, beryl, topaz, muscovite, microcline, quartz.

Distribution: From Høydalen, Tørdal, Telemark, Norway.

Name: Honors John Tveit, in whose quarry in Norway the mineral was first found.

Type Material: Mineralogical-Geological Museum, University of Oslo, Oslo, Norway; National Museum of Natural History, Washington, D.C., USA, 137096.

References: (1) Bergstøl, S., B.B. Jensen, and H. Neumann (1977) Tveitite, a new calcium yttrium fluoride. *Lithos*, 10, 81–87. (2) (1977) *Amer. Mineral.*, 62, 1060 (abs. ref. 1). (3) Bevan, D.J.M., J. Strähle, and O. Greis (1982) The crystal structure of tveitite, an ordered yttrifluorite mineral. *J. Solid State Chem.*, 44, 75–81.