Atelisite-(Y) $Y_4Si_3O_8(OH)_8$

Crystal Data: Tetragonal. *Point Group*: $\bar{4}$ 2*m*. As dipyramidal crystals to 0.3 mm, displaying {101}, {100}, and rarely {001}.

Physical Properties: *Cleavage*: n.d. *Fracture*: n.d. *Tenacity*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.26

Optical Properties: Transparent. *Color*: Colorless to pale brown. *Streak*: Colorless. *Luster*: Vitreous.
Optical Class: Uniaxial (+). ω = 1.727 ε > 1.8

Cell Data: *Space Group*: $I\bar{4}$ 2*d*. a = 6.947(4) c = 6.133(3) Z = 1

X-ray Powder Pattern: Stetind quarry, Tysfjord, Nordland, Norway.
3.474 (100), 2.601 (73), 1.786 (68), 4.598 (57), 1.838 (26), 2.772 (25), 1.737 (24)

Chemistry:

	(1)
SiO_2	18.73
Y_2O_3	45.67
Yb_2O_3	11.81
Gd_2O_3	2.09
Tb_2O_3	0.54
Dy_2O_3	2.61
Ho_2O_3	0.62
Er_2O_3	4.72
H_2O	[12.2]
Total	98.99

(1) Stetind quarry, Tysfjord, Norway; average of 20 electron microprobe analyses, presence of OH^- confirmed by Raman spectroscopy, H_2O calculated for charge balance; corresponding to $(Y_{3.11}Yb_{0.46}Er_{0.19}Dy_{0.11}Gd_{0.09}Ho_{0.01}Tb_{0.02})_{\Sigma=3.99}(Si_{2.4}[H_4+]_{0.605})_{\Sigma=3.01}O_8(OH)_8$.

Occurrence: A late, hydrothermal mineral in dissolution cavities in fluorite in niobium-yttrium-fluorine (NYF) type, quartz-microcline pegmatite.

Association: Xenotime-(Y), calcioancylite-(Nd), La-dominant calcioancylite.

Distribution: From the Stetind quarry, Tysfjord, Nordland, Norway.

Name: From Greek "*atels*", meaning deficient, in allusion to the Si-deficiency of the mineral.

Type Material: Museum of the University of Hamburg, Germany (NO-004).

References: (1) Malcherek, T., B. Mihailova, J. Schlüter, and T. Husdal (2012) Atelisite-(Y), a new rare earth defect silicate of the KDP structure type. European Journal of Mineralogy, 24(6), 1053-1060. (2) (2014) Amer. Mineral., 99, 2151-2152 (abs. ref. 1).