

Mieite-(Y) **$Y_4(Ti)(SiO_4)_2O[(F,(OH))_6]$**

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. In massive aggregates to 1 cm.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle.
 Hardness = 6 D(meas.) = n.d. D(calc.) = 4.61 Metamict.

Optical Properties: Transparent. *Color:* Amber-yellow. *Streak:* White. *Luster:* Adamantine.
Optical Class: Biaxial (n.d.). $\alpha = 1.694(2)$ $\beta = n.d.$ $\gamma = 1.715(5)$ 2V(meas.) = n.d.
 2V(calc.) = n.d. *Pleochroism:* None. Anomalous blue interference colors.

Cell Data: *Space Group:* Cmc₂m. $a = 14.979(6)$ $b = 10.548(5)$ $c = 6.964(3)$ $Z = 4$

X-ray Powder Pattern: Souri Valley, Komono, Mie Prefecture, central Japan. (Heated to 810° C)
 2.68 (100), 3.76 (85), 3.54 (83), 3.48 (82), 2.16 (78), 4.26 (68), 5.46 (58)

Chemistry:		(1)		(1)
SiO ₂		14.70	Dy ₂ O ₃	4.70
P ₂ O ₅		1.06	Ho ₂ O ₃	0.65
TiO ₂		5.32	Er ₂ O ₃	1.73
Al ₂ O ₃		2.84	Tm ₂ O ₃	0.39
Fe ₂ O ₃		0.06	Yb ₂ O ₃	2.13
Y ₂ O ₃		45.14	Lu ₂ O ₃	0.77
Ce ₂ O ₃		0.39	ThO ₂	1.59
Pr ₂ O ₃		0.10	UO ₂	0.63
Nd ₂ O ₃		1.62	F	9.28
Sm ₂ O ₃		1.59	–O = F ₂	3.91
Gd ₂ O ₃		3.99	<u>H₂O</u>	<u>2.19</u>
Tb ₂ O ₃		0.73	Total	97.69

(1) Souri Valley, Komono, Mie Prefecture, central Japan; average of 7 electron microprobe analyses supplemented by IR spectroscopy, H₂O from structure analysis; corresponding to (Y_{3.13}Dy_{0.20}Gd_{0.17}Yb_{0.08}Nd_{0.08}Sm_{0.07}Er_{0.07}Th_{0.05}Tb_{0.03}Ho_{0.03}Lu_{0.03}Ce_{0.02}Tm_{0.02}U_{0.02}) $\Sigma=4.00$ (Ti_{0.52}Al_{0.44}Fe_{0.01}) $\Sigma=0.97$ (Si_{1.92}P_{0.12}) $\Sigma=2.04$ O₉[F_{3.83}(OH)_{1.91}] $\Sigma=5.74$.

Occurrence: In a block of granitic pegmatite collected from a talus slope.

Association: Quartz, albite, K-feldspar, muscovite, allanite-(Ce), gadolinite-(Y), magnesianrowlandite-(Y).

Distribution: In the Souri Valley, Komono, Mie Prefecture, central Japan. Also reported from El'ozero, Kola Peninsula, Russia.

Name: For the prefecture in Japan that produced the first specimens.

Type Material: National Museum of Nature and Science, Tokyo, Japan (NSM-M43627).

References: (1) Matsubara, S., R. Miyawaki, K. Yokoyama, M. Shigeoka, K. Momma and S. Yamamoto (2015) Mieite-(Y), Y₄(Ti)(SiO₄)₂O[(F,(OH))₆], a new mineral in a pegmatite at Souri Valley, Komono, Mie Prefecture, central Japan. *Journal of Mineralogical and Petrological Sciences*, 110, 135-144. (2) (2016) *Amer. Mineral.*, 101, 748-750 (abs. ref. 1).