

Uedaite-(Ce)**Mn²⁺CeAl₂Fe(Si₂O₇)(SiO₄)O(OH)**

Crystal Data: Monoclinic. *Point Group:* 2/m. Prismatic crystals, to 1 mm, elongated on [010].

Physical Properties: *Cleavage:* Poor {001}. *Fracture:* Uneven. *Tenacity:* Brittle.
Hardness = 5-6 D(meas.) = n.d. D(calc.) = 4.19

Optical Properties: Translucent to opaque. *Color:* Black to dark brown. *Streak:* Gray.
Luster: Vitreous.

Optical Class: Biaxial (-). $\alpha = \text{n.d.}$ $\beta = 1.770(5)$ $\gamma = \text{n.d.}$ 2V (meas.) = Large.
Orientation: Y = b. *Pleochroism:* brown to yellow.

Cell Data: *Space Group:* P2₁/m. $a = 8.939(8)$ $b = 5.742(4)$ $c = 10.187(8)$ $\beta = 115.10(6)^\circ$
Z = 2

X-ray Powder Pattern: Shodoshima Island, Kagawa Prefecture, Japan.
2.92 (100), 3.53 (54), 2.71 (43), 2.62 (39), 8.03 (26), 9.23 (24), 2.87 (23)

Chemistry:	(1)	(2)
SiO ₂	29.94	30.13
Al ₂ O ₃	16.02	17.07
FeO	16.01	12.01
MnO	6.01	11.86
MgO	0.07	
CaO	2.42	
La ₂ O ₃	3.09	
Ce ₂ O ₃	10.75	27.44
Pr ₂ O ₃	1.83	
Nd ₂ O ₃	6.44	
Sm ₂ O ₃	1.35	
Gd ₂ O ₃	0.54	
Y ₂ O ₃	0.72	
ThO ₂	0.51	
H ₂ O	1.50	1.51
Total	97.20	100.00

(1) Shodoshima Island, Kagawa Prefecture, Japan; average of 5 electron microprobe analyses, water calculated from structure, corresponding to (Mn_{0.51}Ca_{0.26}) $\Sigma=0.77$ (Ce_{0.39}Nd_{0.23}La_{0.11}Pr_{0.07}Sm_{0.05}Y_{0.04}Gd_{0.02}Th_{0.01}) $\Sigma=0.92$ (Al_{1.89}Fe_{1.34}Mg_{0.01}) $\Sigma=3.24$ (Si₂O₇)(SiO₄)O_{0.85}(OH).
(2) Mn²⁺CeAl₂Fe²⁺(Si₂O₇)(SiO₄)O(OH).

Mineral Group: Epidote group, allanite subgroup.

Occurrence: An accessory mineral in granite.

Association: Allanite-(Ce), monazite-(Ce), zircon, thorite, bastnaesite-(Ce).

Distribution: Shodoshima Island, Kagawa Prefecture, Japan.

Name: Honors Tateo Ueda (1912–2000), who was the first to solve the crystal structure of allanite.

Type Material: National Museum of Nature and Science, Tokyo, Japan, NSM-M28864.

References: (1) Miyawaki, R., K. Yokoyama, S. Matsubara, Y. Tsutsumi, and A. Goto (2008) Uedaite-(Ce), a new member of the epidote group with Mn at the A site, from Shodoshima, Kagawa Prefecture, Japan. *Eur. J. Mineral.*, 20, 261–269. (2) (2008) *Amer. Mineral.*, 93, 1944–1945 (abs. ref. 1).