

Crystal Data: Hexagonal. *Point Group:* $\bar{3}$. As anhedral grains, to 25 μm .

Physical Properties: *Cleavage:* n.d. *Fracture:* n.d. *Tenacity:* n.d. Hardness = n.d.
 $D(\text{meas.}) = \text{n.d.}$ $D(\text{calc.}) = 4.84$

Optical Properties: Opaque. *Color:* n.d. *Streak:* n.d. *Luster:* n.d.
Optical Class: n.d.

Cell Data: *Space Group:* $R\bar{3}$. $a = 9.396$ $c = 8.720$ $Z = 3$

X-ray Powder Pattern: JCDD 71-1022.
 2.900 (100), 1.776 (32), 1.779 (27), 1.515 (19), 2.513 (18), 4.698 (5), 1.450 (4)

Chemistry:	(1)
Al ₂ O ₃	0.70
CaO	2.74
Sc ₂ O ₃	32.36
TiO ₂	5.47
V ₂ O ₃	0.35
Cr ₂ O ₃	0.02
FeO	0.82
Y ₂ O ₃	0.70
ZrO ₂	56.58
HfO ₂	1.21
Total	100.94

(1) Allende meteorite; average of 8 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to $(\text{Sc}_{3.01}\text{Ti}^{4+}_{0.44}\text{Ca}_{0.31}\text{Al}_{0.09}\text{Fe}^{2+}_{0.07}\text{Y}_{0.04}\text{V}^{3+}_{0.03})_{\Sigma=3.99}(\text{Zr}_{2.95}\text{Hf}_{0.04})_{\Sigma=2.99}\text{O}_{12}$.

Occurrence: As grains in an ovoid-shaped, ultra-refractory inclusion in the Allende meteorite, likely a high-temperature condensate early in the formation of the solar system.

Association: Perovskite, Os-Ir-Mo-W alloys, Sc-stabilized tazheranite (cubic zirconia).

Distribution: In ultra-refractory inclusion *ACM-1*, Allende CV3 carbonaceous chondrite meteorite.

Name: For the meteorite that contained the first specimens.

Type Material: National Museum of Natural History, Washington, D.C., USA (USNM 7554).

References: (1) Ma, C., J.R. Beckett, and G.R. Rossman (2014) Allendeite ($\text{Sc}_4\text{Zr}_3\text{O}_{12}$) and hexamolybdenum (Mo,Ru,Fe), two new minerals from an ultrarefractory inclusion from the Allende meteorite. *Amer. Mineral.*, 99, 654-666.