

**Crystal Data:** Tetragonal. *Point Group:*  $4/m\ 2/m\ 2/m$ . Euhedral to irregular crystals and fragments, to 1 cm, heavily zoned with zircon, the outermost portions of which represent this species.

**Physical Properties:** Hardness = n.d.  $D(\text{meas.}) = \text{n.d.}$   $D(\text{calc.}) = 6.97$  (synthetic).

**Optical Properties:** Transparent to translucent. *Color:* Orange-red, brownish yellow, rarely colorless.

*Optical Class:* [Uniaxial.]  $\omega = \text{n.d.}$   $\epsilon = \text{n.d.}$

**Cell Data:** *Space Group:*  $I4_1/amd$  (synthetic).  $a = 6.5725(7)$   $c = 5.9632(4)$   $Z = 4$

**X-ray Powder Pattern:** Synthetic; cannot be distinguished from zircon.  
3.29 (100), 2.512 (70), 4.43 (60), 1.705 (55), 2.638 (25), 2.057 (20), 2.324 (18)

Chemistry:	(1)	(2)
SiO <sub>2</sub>	28.32	27.20
ZrO <sub>2</sub>	3.28	1.21
HfO <sub>2</sub>	69.78	72.52
Total	101.38	100.93

(1) Muiâne mine, Mozambique; by electron microprobe, corresponding to  $(\text{Hf}_{0.80}\text{Zr}_{0.06})_{\Sigma=0.86}\text{Si}_{1.14}\text{O}_4$ . (2) Do.; by electron microprobe, corresponding to  $(\text{Hf}_{0.86}\text{Zr}_{0.02})_{\Sigma=0.88}\text{Si}_{1.12}\text{O}_4$ .

**Occurrence:** In tantalum-bearing granite pegmatites (Zambézia district, Mozambique); in a weathered pegmatite (Mt. Holland, Western Australia).

**Association:** Cookeite, albite (Zambézia district, Mozambique); quartz, potassic feldspar, muscovite, tourmaline, anthophyllite, phlogopite, apatite, cassiterite, ferrocolumbite, beryl, zircon, thorite, microlite, bismoclite, barite, manganotantalite, cesstibtantite, kimrobinsonite (Mt. Holland, Western Australia).

**Distribution:** In the Morro Conco, Moneia, and Muiâne mines, Morrua area, Zambézia district, Mozambique. At Bikita, Zimbabwe. From near Mt. Holland, Western Australia.

**Name:** For *hafnium* in the composition.

**Type Material:** n.d.

**References:** (1) Correia Neves, J.M., J.E. Lopes Nunes, and T.G. Sahama (1974) High hafnium members of the zircon-hafnon series from the granite pegmatites of Zambézia, Mozambique. *Contr. Mineral. Petrol.*, 48, 73–80. (2) (1976) *Amer. Mineral.*, 61, 175 (abs. ref. 1). (3) Salt, D.J. and G. Hornung (1967) Synthesis and X-ray study of hafnium silicate. *J. Amer. Ceram. Soc.*, 50, 549–550. (4) Speer, J.A. and B.J. Cooper (1982) Crystal structure of synthetic hafnon, HfSiO<sub>4</sub>, comparison with zircon and the actinide orthosilicates. *Amer. Mineral.*, 67, 804–808.