

Crystal Data: Monoclinic. *Point Group:* 2/m. As euhedral to subhedral columnar to platy crystals to ~2.5 mm.

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

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

Cell Data: Space Group: $C2/c$. $a = 17.03(2)$ $b = 4.98(1)$ $c = 7.08(1)$ $\beta = 106.3(2)^\circ$ $Z = \text{n.d.}$

X-ray Powder Pattern: Selected-area electron diffraction (SAED) data provided.

Chemistry:	(1)	(2)
TiO ₂	79.0	81.64
Al ₂ O ₃	8.13	
Cr ₂ O ₃	0.19	
MgO	0.20	
FeO	12.0	18.36
<u>MnO</u>	<u>0.51</u>	
Total	100.00	100.00

(1) Northwest Africa (NWA) 8003 meteorite; average TEM-EDX analysis; corresponds to $(\text{Ti}^{4+}_{0.73}\text{Fe}^{2+}_{0.63}\text{Al}_{0.60}\text{Mn}_{0.03}\text{Mg}_{0.02}\text{Cr}_{0.01})_{\Sigma=2.02}\text{Ti}^{4+}_3\text{O}_9$. (2) $(\text{Ti}^{4+}\text{Fe}^{2+})\text{Ti}^{4+}_3\text{O}_9$.

Mineral Group: An Andersson phase ($\text{M}_2\text{M}_{n-2}\text{O}_{2n-1}$, $n = 5$).

Polymorphism & Series: Forms a solid solution series with machiite.

Occurrence: In two titanium-rich, shock melt pockets (20-30 mm in size), which are enclosed by former plagioclase (now maskelynite, plagioclase, and tissintite), augite and ilmenite in a basaltic eucrite meteorite.

Association: Corundum, ilmenite, Al-Ti-rich pyroxene.

Distribution: From the Northwest Africa (NWA) 8003 meteorite.

Name: After asteroid 4 *Vesta*.

Type Material: Mineralogical Collection, Friedrich Schiller University, Jena, Germany (42073 and 42074).

References: (1) Pang, R.-L., D. Harries, K. Pollok, A.-C. Zhang, and F. Langenhorst (2018) Vestaite, $(\text{Ti}^{4+}\text{Fe}^{2+})\text{Ti}^{4+}_3\text{O}_9$, a new mineral in the shocked eucrite Northwest Africa 8003. *Amer. Mineral.*, 103(9), 1502-1511.