

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As grains to 4 μm ; in aggregates to 12 μm .

Physical Properties: *Cleavage:* n.d. *Tenacity:* n.d. *Fracture:* n.d. *Hardness* = n.d.
D(meas.) = n.d. D(calc.) = 3.70-3.78

Optical Properties: *Color:* Blue to purple likely, reflecting high concentrations of tri- and quadrivalent Ti. *Streak:* n.d. *Luster:* n.d.
Optical Class: n.d.

Cell Data: *Space Group:* $P\bar{1}$. $a = 10.367$ $b = 10.756$ $c = 8.895$ $\alpha = 105.98^\circ$ $\beta = 96.04^\circ$
 $\gamma = 124.72^\circ$ $Z = 2$

X-ray Powder Pattern: n.d.

2.544 (100), 2.541 (78), 2.540 (77), 2.684 (74), 2.684 (72), 4.802 (55), 8.067 (53)

Chemistry:	(1)	(2)
Sc ₂ O ₃	33.76	35.59
ZrO ₂	3.33	2.58
CaO	14.84	13.79
TiO ₂	2.44	1.87
Ti ₂ O ₃	4.03	3.25
Al ₂ O ₃	39.52	36.86
FeO	0.46	1.45
MgO	1.21	1.2
SiO ₂	0.06	0.78
Y ₂ O ₃	0.84	0.6
V ₂ O ₃	0.29	1.96
Gd ₂ O ₃	0.3	
Dy ₂ O ₃	0.47	
Total	101.56	99.94

(1) Murchison meteorite; average electron microprobe analysis; corresponds to
Ca_{2.00}[(Sc_{4.05}Ti³⁺_{0.46}Al_{0.41}Y_{0.06}V_{0.03}Dy_{0.02}Gd_{0.01})(Ti⁴⁺_{0.25}Zr_{0.22})(Mg_{0.25}Ca_{0.19}Fe²⁺_{0.05})](Al_{6.00}Si_{0.01})O₂₀.

(2) Vigarano meteorite; average electron microprobe analysis; corresponds to
Ca_{2.00}[(Sc_{4.33}Ti³⁺_{0.38}V³⁺_{0.22}Al_{0.17}Y_{0.04})(Mg_{0.25}Ca_{0.06}Fe²⁺_{0.17})(Zr_{0.18}Ti⁴⁺_{0.20})](Al_{5.89}Si_{0.11})O₂₀.

Mineral Group: Sapphirine supergroup, rhönite group.

Occurrence: In ultra-refractory Ca, Al-rich inclusions (UR CAIs) from CM, CV, CO, and CH chondrite meteorites.

Association: Ti-rich oxide, either perovskite or kangite in cores mantled and rimmed by davisite and/or Sc-diopside (CM, CO, and CV CAIs); perovskite, grossite in cores mantled by grossite \pm gehlenite, and rimmed by low-Sc Al-diopside (CH CAIs and one CO CAI).

Distribution: From the Murchison meteorite and Vigarano meteorite.

Name: Honors David *Wark* (1939-2005), an Australian cosmochemist, for contributions to research in meteoritics, especially, CAIs in carbonaceous chondrites.

Type Material: Field Museum, Chicago, Illinois, USA (Me2642) (Murchison) and the National Museum of Natural History, Washington D.C., USA (USNM 7618) (Vigarano).

References: (1) Ma, C., A.N. Krot, J.R. Beckett, K. Nagashima, O. Tschauer, G.R. Rossman, S.B. Simon, and A. Bischoff (2020) Warkite, Ca₂Sc₆Al₆O₂₀, a new mineral in carbonaceous chondrites and a key-stone phase in ultrarefractory inclusions from the solar nebula. *Geochimica et Cosmochimica Acta*, 277, 52-86. (2) Williams P.A., F. Hatert, M. Pasero, and S.J. Mills (2014) IMA Commission on new minerals, nomenclature and classification (CNMNC) Newsletter 20. New minerals and nomenclature modifications approved in 2014. *Mineral. Mag.*, 78, 552.