

Crystal Data: Hexagonal. *Point Group:* $\bar{3}$. As anhedral, angular, strongly fractured crystal fragments, to 235 μm , in glass.

Physical Properties: *Cleavage:* Poor on {100}; commonly shows sets of {201} and {200} lamellae which are believed not to be related by twinning, but were probably shock-induced. Hardness = n.d. D(meas.) = n.d. D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* [White (?).]
Optical Class: Uniaxial (+); anomalously biaxial due to strain. ω = n.d. ϵ = n.d.
 $2V(\text{meas.}) = < 5^\circ$

Cell Data: *Space Group:* $P\bar{3}$, (probable). $a = 9.939(2)$ $c = 8.245(2)$ $Z = \text{n.d.}$

X-ray Powder Pattern: Moon.

8.57 (100), 2.979 (91), 3.718 (79), 2.871 (78), 1.158 (51), 2.062 (41), 4.123 (36)

Chemistry:

	(1)	(2)
SiO ₂	28.0	15.8
TiO ₂	0.07	0.12
Al ₂ O ₃	45.9	56.3
FeO	0.18	0.41
MgO	0.98	0.40
CaO	25.5	27.8
Na ₂ O	0.00	0.09
K ₂ O	0.00	0.01
Total	100.7	100.9

(1) Moon; by electron microprobe, corresponding to $(\text{Ca}_{0.66}\text{Mg}_{0.04})_{\Sigma=0.70}(\text{Al}_{1.30}\text{Si}_{0.67})_{\Sigma=1.97}\text{O}_4$.

(2) Do.; by electron microprobe, corresponding to $(\text{Ca}_{0.73}\text{Mg}_{0.02}\text{Fe}_{0.01})_{\Sigma=0.76}(\text{Al}_{1.64}\text{Si}_{0.39})_{\Sigma=2.03}\text{O}_4$.

Occurrence: A metastable phase, as shocked crystal fragments and in devitrified glasses in a regolith breccia. The glass may have resulted from shock melting of alkali anorthite on the ancient lunar highlands.

Association: Glass.

Distribution: On the Moon, near the Apollo 14 landing site.

Name: For T. Yoshioka (1935–1983), who studied the synthetic phase.

Type Material: NASA, Johnson Space Center, Houston, Texas, USA, regolith breccia 14076.

References: (1) Vaniman, D.T. and D.L. Bish (1990) Yoshiokaite, a new Ca,Al-silicate mineral from the Moon. *Amer. Mineral.*, 75, 676–686.