Yoshiokaite $Ca(Al,Si)_2O_4$

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 showis 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(meas.) = $< 5°$

Cell Data: *Space Group:* $P\bar{3}$, (probable). $a = 9.939(2)$ $c = 8.245(2)$ Z = 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_2O_3	45.9	56.3
FeO	0.18	0.41
MgO	0.98	0.40
CaO	25.5	27.8
Na_2O	0.00	0.09
K_2O	0.00	0.01
Total	100.7	100.9

(1) Moon; by electron microprobe, corresponding to $(Ca_{0.66}Mg_{0.04})_{\Sigma=0.70}(Al_{1.30}Si_{0.67})_{\Sigma=1.97}O_4$.
(2) Do.; by electron microprobe, corresponding to $(Ca_{0.73}Mg_{0.02}Fe_{0.01})_{\Sigma=0.76}$ $(Al_{1.64}Si_{0.39})_{\Sigma=2.03}O_4$.

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.