

Crystal Data: Monoclinic. *Point Group:* 2/m. As elongated crystals to 3.6 μm.

Physical Properties: *Fracture:* n.d. *Tenacity:* n.d. *Hardness:* = n.d. *D(meas.):* = n.d. *D(calc.):* = 4.29

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

Cell Data: *Space Group:* C2/c. *a* = 10.115 *b* = 5.074 *c* = 7.182 *β* = 112° *Z* = 4

X-ray Powder Pattern: Calculated pattern.

2.662 (100), 3.377 (75), 2.931 (73), 1.671 (67), 1.737 (66), 2.466 (59), 4.689 (53)

Chemistry:	(1)	(2)
Ti ₂ O ₃	[56.55]	64.28
TiO ₂	[39.29]	35.72
Al ₂ O ₃	1.18	
MgO	1.39	
FeO	0.59	
V ₂ O ₃	0.08	
Total	99.07	100.00

(1) Allende CV3 carbonaceous chondrite meteorite, average of 4 electron microprobe analyses, Ti³⁺/Ti⁴⁺ apportioned by stoichiometry; corresponds to (Ti³⁺_{1.75}Al_{0.05}Ti⁴⁺_{0.10}Mg_{0.08}Fe_{0.02})(Ti⁴⁺_{1.00})O₅.
(2) Ti³⁺₂Ti⁴⁺O₅.

Mineral Group: Berdesinskiite group.

Occurrence: In a CV3 carbonaceous chondrite meteorite.

Association: Tistarite, rutile, Ti³⁺-bearing corundum oxide (Ti³⁺,Al,Zr,Si,Mg)_{1.95}O₃, Ti-xifengite.

Distribution: In the Allende CV3 carbonaceous chondrite meteorite (fallen near Pueblito de Allende, Chihuahua, Mexico on February 8th, 1969).

Name: After the Chinese words “*kai tian*,” meaning creating the heaven (sky). Chinese mythology says Pan Gu, the giant, created the world by separating heaven and earth from an egg-shaped chaos.

Type Material: National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA (USNM 3510-5).

References: (1) Ma, C. and J.R. Beckett (2021) Kaitianite, Ti³⁺₂Ti⁴⁺O₅, a new titanium oxide mineral from Allende. *Meteoritics & Planetary Science* 56, Nr 1, 96-107. (2) Ma, C. (2019) Discovery of kaitianite, Ti³⁺₂Ti⁴⁺O₅, in Allende: a new refractory mineral from the solar nebula. 82nd Annual Meeting of The Meteoritical Society (LPI Contrib. No. 2157), 6098.pdf. (3) (2020) *Amer. Mineral.*, 105, 1922 (abs. ref. 2).