Paqueite $Ca_3TiSi_2(Al, Ti, Si)_3O_{14}$

Crystal Data: Hexagonal. *Point Group*: 32. As micrometer-sized euhedral crystals within aluminous melilite.

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

Optical Properties: n.d. *Color*: n.d. S*treak*: n.d. *Luster*: n.d.
Optical Class: n.d.

Cell Data: Space Group: *P*321. a = 7.943 c = 4.930 Z = 1

X-ray Powder Pattern: Calculated pattern.
3.093 (100), 2.821 (68), 2.300 (43), 1.789 (28), 2.600 (21), 6.879 (20), 1.908 (17)

Chemistry:

	(1)
Na_2O	0.62
CaO	29.58
MgO	0.18
Al_2O_3	15.21
V_2O_3	1.56
Sc_2O_3	0.84
SiO_2	24.43
TiO_2	27.51
Total	99.93

(1) Allende CV3 meteorite; average of 5 electron microprobe analyses; corresponds to $(Ca_{2.91}Na_{0.11})_{\Sigma=3.02}Ti^{4+}Si_2(Al_{1.64}Ti^{4+}_{0.90}Si_{0.24}V^{3+}_{0.12}Sc_{0.07}Mg_{0.03})_{\Sigma=3.00}O_{14}$.

Occurrence: Formed during late-stage dynamic crystallization or by exsolution in a carbonaceous chondrite meteorite.

Association: Aluminous melilite, burnettite, spinel, perovskite, grossmanite-davisite, hibonite.

Distribution: From a V-rich, fluffy Type A Ca-Al-rich inclusion (CAI) A-WP1 in Allende carbonaceous chondrite CV3, Pueblito de Allende, Chihuahua, Mexico.

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Type Material: National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM 7617).

References: (1) Ma, C. and J.R. Beckett (2016) Burnettite, $CaVAlSiO_6$, and paqueite, $Ca_3TiSi_2(Al_2Ti)O_{14}$, two new minerals from Allende: clues to the evolution of a V-rich Ca-Al-rich inclusion. 47th Lunar and Planetary Science Conference, session T335, 1595. (2) (2020) Amer. Mineral., 105(10), 1599 (abs. ref. 1).