Burnettite $CaVAlSiO_6$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. 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: *C*2/*c*. $a = 9.80$ $b = 8.85$ $c = 5.36$ $\beta = 105.62°$ Z = 4

X-ray Powder Pattern: Calculated pattern.
2.996 (100), 2.535 (47), 2.581 (41), 2.964 (33), 2.560 (29), 2.909 (20), 2.131 (19)

Chemistry:

	(1)
CaO	24.83
MgO	1.51
Al_2O_3	23.36
V_2O_3	9.35
Sc_2O_3	6.89
SiO_2	25.69
TiO_2	8.49
Total	100.12

(1) Allende CV3 meteorite; average of 5 electron microprobe analyses; corresponds to $Ca_{1.04}[(V^{3+}_{0.29}Sc_{0.24}Ti^{3+}_{0.13}Al_{0.09})Ti^{4+}_{0.13}Mg_{0.08}]_{\Sigma=0.96}(Si_{1.01}Al_{0.99})_{\Sigma=2.00}O_6$.

Mineral Group: Pyroxene group.

Occurrence: Probably formed in reducing conditions from an ultra-refractory parent of a carbonaceous chondrite meteorite.

Association: Aluminous melilite, paqueite, 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).