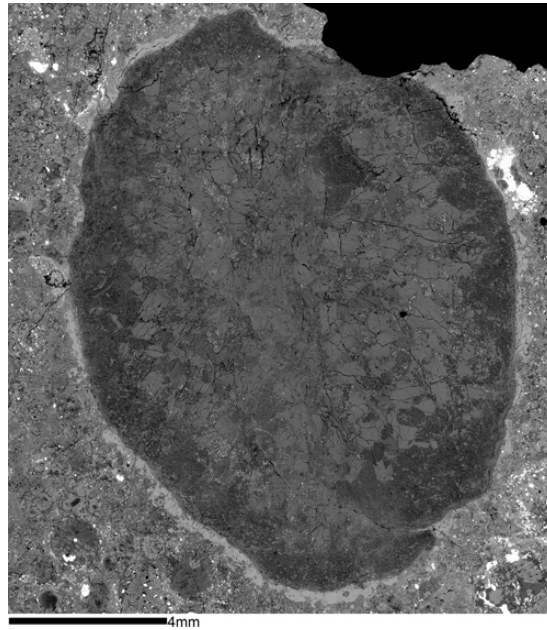


**ABUNDANT CHLORAPATITE WITHIN ANOMALOUS REDUCED CV3 CHONDRITE NORTHWEST AFRICA 8418 AND PAIRED STONES.**

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Chlorapatite is unusually abundant in the matrices of, and rimming large CAI within, a group of 11 paired metal-bearing CV3 chondrite stones from Northwest Africa.

**Petrography:** The specimen studied in most detail (NWA 8418) consists of granular-textured chondrules (diameter 0.5-3 mm) and sparse CAI within a finer-grained matrix containing fresh Ni-poor kamacite, chlorapatite and rare merrillite. Chlorapatite also forms continuous rims (surrounded in turn by calcite) on a large (1.5 cm), coarse grained, porous CAI composed of anorthite, Al-Ti-diopside, olivine, pleonaste, troilite and taenite (see image). A 14-element electron microprobe analysis of apatite (N = 11) gave (in wt.%): SiO<sub>2</sub> 0.23, FeO 0.21, MnO 0.04, CaO 53.58, MgO 0.05, SrO 0.10, Na<sub>2</sub>O 0.43, P<sub>2</sub>O<sub>5</sub> 40.68, SO<sub>3</sub> 0.00, Cl 5.25, F 0.55, Y<sub>2</sub>O<sub>3</sub> 0.01, La<sub>2</sub>O<sub>3</sub> 0.04, Ce<sub>2</sub>O<sub>3</sub> 0.10, SUM 99.84.



*BSE image of large CAI in NWA 8418 rimmed by chlorapatite (light gray). Anorthite is dark gray, olivine and diopside are medium gray, kamacite is bright.*

**Oxygen Isotopes:** Analyses of acid-washed subsamples by laser fluorination gave, respectively: <sup>17</sup>O -3.994, -5.750, -5.299; <sup>δ</sup><sup>18</sup>O 0.444, -1.773, -0.823; <sup>Δ</sup><sup>17</sup>O -4.228, -4.814, -4.864 per mil (for a TFL slope of 0.528). These values plot on the CCAM trend within the established field for CV chondrites.

**Discussion:** Although apatite has been reported in CAI in the Maralinga CK chondrite [1], it is rare in CV chondrites and has not been previously observed as rims around CAI [2].

**References:** [1] Noguchi T. 1993. *Proc. NIPR Symp. Antarct. Met.* **6**, 204-233 [2] MacPherson G. et al. 1985. *Geochim. Cosmochim. Acta* **49**, 2267-2279.