A PETROGRAPHIC AND ION PROBE ISOTOPIC STUDY OF TYPE A COARSE-GRAINED INCLUSIONS

I.D. Hutcheon, *Enrico Fermi Institute*
G.J. MacPherson and I.M. Steele, *Dept. of Geophysical Sciences, University of Chicago, Chicago, IL 60637*
L. Grossman, *Enrico Fermi Institute and Dept. of Geophysical Sciences, University of Chicago, Chicago, IL 60637*

Petrographic evidence suggests that irregularly shaped, highly altered, hibonite-bearing Type A Allende inclusions probably formed by accretion of individual crystals and crystal aggregates and are unlikely to have been melted. One inclusion (TS28) contains central 0.25 mm hibonites and rare Fe-V-rich, Ti-poor spinels, with an outer mantle of melilites (Åk ~ 5-15) (some of which are in clumps), and an extensive outer rim sequence. Clumps of equant melilites are compact, have ~ 120° triple grain boundaries and little internal alteration. The inclusion itself is heavily altered throughout to nepheline (*ne*) and grossular (*gr*). Large hibonites have patchy zoning of Mg (0.8-3 wt % MgO) and are locally altered to *ne* and *gr*. Ion probe Mg isotopic data from seven mililites show distinct ^{26}Mg excesses and, including data for spinel, lie along the canonical Allende isochron from Type B inclusions $[(^{26}Al/^{27}Al)_0 \sim 5 \times 10^{-5}]$, but one melilite lies $>4\ \sigma$ below the isochron, indicating some disturbance of the Al-Mg system. Mg isotopic results from hibonite and alteration products which have higher $^{27}Al/^{24}Mg$ ratios than any of the primary phases do not lie along the isochron, but rather along a horizontal line which intersects the y-axis at $\delta^{26}Mg \sim +12‰$. A possible model for the formation of this inclusion which incorporates all our observations is: (1) condensation of hibonite, melilite and spinel which contained live ^{26}Al; (2) assembly of the inclusion; (3) formation of alteration products by preferential reaction of the nebular gas with hibonite after decay of ^{26}Al, which may well have involved the addition of Al and other elements. Preliminary isotopic analysis of two melilites from a Type A inclusion in Leoville (without hibonite) yielded data on the standard Allende isochron.

ACCRETION TEMPERATURE OF THE TIESCHITZ, H3, CHONDRITE

R. Hutchison and A.W.R. Bevan, *British Museum (Natural History), London SW7 5BD*
S.O. Agrell, *Department of Mineralogy and Petrology, Cambridge, CB2 3EW*

Texturally, some chondrules and silicate matrix materials in Tieschitz were apparently mobile after accretion. Experimental petrology tells us that under low pressures they could not have been plastic below about 1,050 °C. Heat loss from matrix silicate in channels only 25-50 μm wide would have been rapid had most components been cold. We therefore argue that the