occurrence of thin, serpentine-type grains has also been observed in dispersed matrix material from Nagoya and Murray (McKee and Moore, 1979). A relatively large grain (radius ~ 8000A) resembling "Povlen-type" chrysotile is also observed in the Mighei matrix. Povlen-type chrysotile is a splintery, non-fibrous variety containing an inner cylindrical core, surrounded by polygonal outer zones (Cressey and Zussman, 1976). The Povlen-type structure is limited in its compositional range to Mg-rich polymorphs of chrysotile or lizardite (Wicks, 1979). In general, textures observed in the Mighei matrix are similar to those reported for the matrix of the Murchison C2 carbonaceous chondrite (Mackinnon and Buseck, 1979).

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MELTED AND NON-MELTED COARSE-GRAINED Ca-, Al-RICH INCLUSIONS IN ALLENDE

G.J. MacPherson, *Dept. of Geophysical Sciences, University of Chicago, Chicago, IL 60637*
L. Grossman, *Dept. of Geophysical Sciences & Enrico Fermi Institute, University of Chicago, Chicago, IL 60637*

Two Type B inclusions in our collection are compact, subspherical, slightly altered, and contain very elongate melilite crystals that project radially inward from the inclusion edge. Small melilites at the edge show axiolitic interference growth texture. Individual edge melilites become progressively more Mg-rich along their length, away from the inclusion edge. Also, interior melilites zone outwards to higher Mg contents (Åk 60) than edge ones (Åk 25). The highest temperature melilites thus occur at the inclusion edge. Textures suggest that melilite began crystallizing first, followed by spinel and then Ti-, Al-clinopyroxene (Tpx): Tpx fills angular interstices between edge melilites; spinel inclusions are concentrated in Tpx, interior melilites and Mg-rich rims of edge melilites. It is difficult to envision how vapor-to-solid condensation could produce a spherical shell from which crystals grew inward. The above features, however, are consistent with the interpretation that a liquid droplet cooled at its margin and crystallized progressively inward.

Two Type A inclusions are similar to the above but contain only rare Tpx (very Ti-rich, ~ 10%) and minute hibonite blades enclosed by melilite near the inclusion margins. Melilites are generally very Mg-rich (Åk 40-80).

The hibonite is interpreted to be the highest temperature, first crystallizing phase in these inclusions.

Seven other inclusions, all Type A, form a distinct class with very different properties from the above. They have very irregular shapes, are extremely altered, contain melilite with a very narrow composition range (Åk 0-25, ~ 300 analyses) and have hibonite and perovskite (phases predicted to be the highest temperature condensates) in their *cores*. Wark-Lovering rim sequences are continuous around the highly convoluted exterior surfaces of these inclusions, an unexpected feature had the inclusions originated as plastic, once-molten spheres that were later deformed during compaction. We thus believe the irregular shapes pre-date assembly of the meteorite and suggest that these inclusions are loose aggregates of independently solidified crystals, possibly vapor-to-solid condensates.

One of the melted Type B inclusions above is sample A13S4 of Clayton *et al.* (1977) who found that oxygen isotopic compositions of its constituent phases fell on the mixing line of slope unity, with spinels and pyroxenes more enriched in ^{16}O relative to melilite. A previous interpretation of such distributions in terms of a melting model required spinel and pyroxene to crystallize first from an ^{16}O-rich liquid droplet that re-equilibrated with more ^{18}O-rich gas as it solidified, with melilite crystallizing last from the most ^{18}O-rich liquid. Our interpretation of this inclusion suggests, however, that melilite crystallized *first*. Perhaps this inclusion was once a liquid ^{16}O-rich sphere that re-equilibrated isotopically *after complete solidification*, by solid-state diffusion of oxygen that was controlled by the crystal structures of the different mineral phases.

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CRYSTALLIZATION OF IMPACT MELT ROCKS FROM SCANDINAVIAN METEORITE CRATERS

U. Maerz and D. Stöffler, *Institut für Mineralogie, Gievenbecker Weg 61, 44 Münster, Germany*

Melt rocks from the eroded impact sites of Lappajärvi ("kärnäite"), Dellén ("dellenite") and Mien ("rhyolite") situated in precambrian crystalline bedrock have been examined by microscopic textural and chemical analyses. Melt occurs in two main types of samples: (1) autochthonous, coherent melt sheet and (2) small particles within suevite breccias.

The texture common to all samples of the first type can be described as fine-grained mesostasis-rich crystalline rock with mineral and lithic clasts. The texture of the matrix varies from porphyritic to subophitic. The sequence of crystallization is: strongly zoned plagioclase with a maximum An-content of 88%, titanomagnetite-orthopyroxene-cordierite, zoned alkalifeldspar forming