indicate similar processes caused loss of volatiles plus redistribution of volatiles in both ordinary chondrites and lunar breccias. Cooling of hot ejecta blankets on parent meteorite bodies would include movement of vapors (such as oxides, halides, sulfides, iron) from hotter to cooler areas, and result in eventual loss of non-condensable species and deposition of condensable species in cooler areas. This would explain some of the volatile depletions in ordinary chondrites. Cooling of large, thermally-zoned ejecta blankets would also partially explain the "progressive" thermal metamorphism of ordinary chondrites with the more recrystallized meteorites originating in the hotter zones of the ejecta blanket.

TRACE ELEMENTS IN ALLENDE AMOEBOID AGGREGATES

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Amoeba-shaped aggregates of micron-sized olivine, clinopyroxene, nepheline and sodalite grains are common constituents of the Allende meteorite. The FeO content of the olivine (Fo_{64} to Fo_{99}) and the presence of feldspathoids suggest that these aggregates contain a component which equilibrated with the solar nebular vapor in the temperature range 500 to 900 °K. Some of the pyroxenes contain more than 5% of Al_2O_3 and of TiO_2, reminiscent of the coarse-grained, white, Ca-Al-rich inclusions in this meteorite. Also, some aggregates contain ragged inclusions of spinel and perovskite, suggesting that a high-temperature, >1400 °K, condensate component is also present.

Trace element contents of 10 of these aggregates were determined by INAA. Volatile elements are present in moderate amounts, Na: 0.4 to 3.1%, Fe: 6 to 19%, Mn: 600 to 1800 ppm, Cr: 400 to 2200 ppm, Co: 20 to 150 ppm, Au: 10 to 400 ppb. On the other hand, refractory Ca, Sc, Hf, Ru, Os, Ir and rare earths have mean enrichment factors of 3 to 9 relative to their abundances in Cl chondrites. Thus, the trace elements, like the mineralogy, suggest that the aggregates are composed of constituents having markedly different temperature histories.

Covariation trends of refractory elements in the amoeboid aggregates are markedly similar to those in the coarse-grained white inclusions. The pairs Sc-Hf and Os-Ir correlate very strongly with one another along straight lines having slopes equal to their cosmic abundance ratios. Also, rare earth element patterns are unusually relatively flat, although two amoeboids have highly fractionated rare earth abundances similar to the fine-grained pink inclusions. The mean concentrations of the refractory elements suggest that the amoeboid olivine aggregates contain an average of about 30% high-temperature condensates similar in composition to the coarse-grained white inclusions.