Final Technical Report

Cosmochemical Studies: Meteorites, Asteroidal Processes, Chondrules

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Summary of research

Our research mainly concerned the asteroidal processes involved in the formation of meteorites and meteoritic chondrules. We continued to generate large amounts of instrumental-neutron-activation analysis (INAA) data, both for irons, chondrites and primitive achondrites. Major themes of our chondrule research were (1) the temperature and crystallization history of individual chondrules, and (2) the evolution of the solar nebula during the period within which chondrule formation occurred. Much of our chondrule research was focused on the highly primitive CO3.0 chondrites. We initiated a study of the cooling history of high-FeO chondrules by characterizing the overgrowth layers on relict grains.

We also continued our studies of the composition and the formation of iron meteorites and the evolution of their parent planets. The large data sets that we have generated at UCLA allows systematic comparisons of the large magmatic groups both in terms of fractional crystallization (including rough estimates of nonmetal contents of the parental melts) and in terms of the effects of variable contents of trapped melt. We have completed a preliminary study of group IIIAB in which we developed a trapped-melt model and more detailed studies of group IVA (Wasson and Richardson, 2001 [attached]) and the main-group pallasites (Wasson and Choi, 2002). By comparing these large groups and modeling them by a combination of crystallization and melt trapping, we are able to better define both the formation processes and the nature of the solid/liquid elemental partitioning.

We helped maintain the excellent neutron-activation facilities at UCLA, a major resource for the cosmochemical community.

Supported Publications

NASA grant NAG5-10421 (J.T. Wasson, P.I.) COSMOCHEMICAL STUDIES

Research papers and abstracts mainly funded by this grant; submission dates during the period 01 Feb 2001 31- Jan 2002


Copies of the first two papers are attached.

Abstracts:


No copies of the abstracts are included.

**Patents and Inventions**

No patents or inventions resulted from the research effort supported by this grant.