Friday, March 21, 2003
CAIs: REFRACTORY DIRECT TO YOU
8:30 a.m. Marina Plaza Ballroom

Chairs: J. N. Cuzzi
G. J. MacPherson

Cuzzi J. N. * Davis S. S. Dobrovolskis A. R.
Creation and Distribution of CAIs in the Protoplanetary Nebula **[#1749]**
Outward diffusion in a turbulent nebula allows CAIs to survive gas drag for 1–3 Myr. Rapid drift of silicate/carbon rich boulders into the CAI formation zone may provide a reduced environment and mass-independent fractionation of O-isotopes.

Hiyagon H. * Hashimoto A. Kimura M. Ushikubo T.
First Discovery of an Ultra-Refractory Nodule in an Allende Fine-grained Inclusion **[#1552]**
We discovered an ultra-refractory nodule in a fine-grained inclusion in Allende. It shows high contents of Sc, Y, Zr, some refractory metal grains and a highly-enriched HREE pattern.

Harazono K. * Yurimoto H.
Oxygen Isotopic Variations in a Fluffy Type A CAI from the Vigarano Meteorite **[#1540]**
We report coexistence of ^{16}O-rich and ^{16}O-poor melilite in a fluffy Type A CAI from the Vigarano meteorite. The discovery indicates that multiple heating processes in the solar nebula are required to form fluffy Type A CAIs.

Mendybaev R. A. * Richter F. M. Davis A. M.
Formation of the Melilite Mantle of the Type B1 CAIs: Experimental Simulations **[#2062]**
Synthetic CAIs with melilite mantles (like natural Type B1 CAIs) have been made by isothermal crystallization and also by slow cooling in a reducing gas.

Simon S. B. * Grossman L.
Insights into the Formation of Type B2 Refractory Inclusions **[#1796]**
Type B2 inclusions tend to have relatively SiO_2-rich compositions compared to those of B1s and inferences about the formation of Type B CAIs that are based on studies of Type B1 compositions should not be routinely extended to Type B2s.

Janney P. E. * Davis A. M. Wadhwa M. Mendybaev R. A. Richter F. M.
High Precision Magnesium Isotopic Measurements of CAI Evaporation Residues **[#1940]**
High precision magnesium isotopic analyses by ICPMS confirm that laboratory evaporation of magnesium from a CAI melt follows the Rayleigh law.

Miller S. A. * Burnett D. S. Asimow P. D.
Experimental Divalent Element Partitioning Between Anorthite and CAI Melt **[#1446]**
We demonstrate that anorthite can be crystallized from a wide range of melt compositions, which can isolate the effects of melt composition and crystal chemistry on partitioning. Experiments to date show that liquid composition is significant.

MacPherson G. J. * Huss G. R.
Al-rich Chondrules: Petrologic Basis for Their Diversity, and Relation to Type C CAIs **[#1825]**
The bulk compositions of Al-rich chondrules straddle both the olivine-plagioclase cotectic and a thermal divide on that cotectic, explaining much of the observed petrographic diversity. Type C CAIs differ because they never crystallize olivine.

Ash R. D. * McDonough F. W. Rumble D. III
Rare Earth Elements and Oxygen Isotopes in Allende Chondrules as Evidence for CAI Mixing in Chondrule Precursors **[#1907]**
REE and O isotopes in an Allende Al-rich CAI indicates the presence of CAI material in the precursor. Live ^{26}Al may have been inherited from the same source, with implications for chronology.

Lyons J. R. * Young E. D.
Towards an Evaluation of Self-shielding at the X-point as the Source of the Oxygen Isotope Anomaly in CAI's **[#1981]**
Self-shielding in a 2000 K, 10 mbar solar nebula is shown to yield a maximum, mass-independent fractionation in H_2O of +350‰. However, atomic C rapidly reacts with H_2 and H_2O to reform CO, preventing transfer to silicates.

Chaussidon M. * Robert F. Russel S. S. Gounelle M. Ash R. D.
Variations of Apparent ^{10}Be/^{9}Be Ratios in Leoville MRS-06 Type B1 CAI: Constraints on the Origin of ^{10}Be and ^{26}Al **[#1347]**
Leoville MRS06 type B1 CAI shows perturbations of its ^{10}Be/B and ^{26}Al/Mg systems. The variations of the ^{10}Be/^{9}Be and ^{7}Li/^{6}Li ratios from core to rim of the CAI may indicate that the already-formed CAI was irradiated around the T-Tauri Sun.

Desch S. J. * Srinivasan G. Connolly H. C. Jr.
An Interstellar Origin for the Beryllium 10 in CAIs **[#1394]**
We have calculated the rate at which GCRs produce ^{10}Be by spallation, and the rate at which ^{10}Be GCRs are trapped, in the solar nebula. To within the uncertainties, the ^{10}Be/^{9}Be ratio in CAIs is explained, obviating the need for the "X-wind" model.

Paque J. M. * Burnett D. S. Chaussidon M.
USNM 3515: An Allende CAI with Li Isotopic Variations **[#1401]**
Detailed petrographic study of the Type B1 CAI USNM 3515 neither confirms nor refutes the interpretation that the Li isotopic variations are due to ^{7}Be (Chaussidon et al., 2002). The Li isotopic variability could reflect addition of Li during alteration, followed by shock and/or pulse heating.