Wednesday, March 14, 2007
CHONDRULES AND THEIR FORMATION
1:30 p.m. Crystal Ballroom B

Chairs: **H. C. Connolly Jr.**
J. S. Boesenberg

1:30 p.m. Connolly H. C. Jr.* Weisberg M. K. Huss G. R. Nagashima K. Ebel D. S. Schrader D. L. Lauretta D. S.
On the Nature and Origins of Type II Chondrules from CR2 Chondrites **[#1571]**
Our investigation of 31 type II chondrule and fragments documents the petrographic nature and the mineral and oxygen isotopic composition. We show that these objects can be rich in sulfide assemblages and clearly had a complex history.

1:45 p.m. Schrader D. L. * Connolly H. C. Jr. Lauretta D. S. Weisberg M. K. Ebel D. S.
Characterization of Opaque Phases in Type-II Chondrules from CR2 Chondrites **[#1368]**
We report the results of our investigation to (1) characterize the metal and sulfide phases within type-II chondrules for CR chondrites and (2) compare these finding to other primitive chondrites (OCs).

2:00 p.m. Kita N. T. * Nagahara H. Tachibana S. Founelle J. H. Valley J. W.
Oxygen Isotopic Compositions of Chondrule Glasses in Semarkona (LL3.0): Search for ^{16}O-depleted Components in Chondrules **[#1791]**
We found variable amount of $\Delta^{17}O$ in chondrule glasses up to +5‰, though they are much higher than coexisting clino-pyroxene. The result implies oxygen isotope exchange with ^{16}O depleted nebula gas during chondrule formation was limited.

2:15 p.m. Boesenberg J. S. * Cosarinsky M. McKeegan K. D. Chaussidon M. Hewins R. H.
An Experimental Study of Fe-Mg and Oxygen Isotope Exchange Between Relict Olivine and Chondrule Melt **[#1621]**
Isothermal and dynamic crystallization experiments show that relict olivines retain their original $\delta^{18}O$ signature despite significant Fe-Mg exchange with chondrule melt. Relicts can easily be obscured from electron microprobe detection.

2:30 p.m. Whattam S. A. * Hewins R. H.
Olivine Sintering Experiments and Lithic Clasts in Chondrules **[#1983]**
Dunite in chondrules suggests derivation from planetesimals. We cannot easily sinter dunite from olivine aggregates, supporting this idea. Dunite clasts are easily disrupted in synthetic chondrules, producing porphyritic olivine textures.

2:45 p.m. Choi B.-G. * Nakamura T. Kusakabe M.
Ion Microprobe Measurements of Oxygen Isotope Compositions of Artificial Chondrule and CAI: Implication for Nebular Oxygen Exchange During the Formation of Chondrules and CAIs **[#1054]**
SIMS measurements for O-isotopes of artificial chondrule and CAI show that, if O_2 partial pressure was high enough possibly by dissociation of H_2O, the mixing line observed in chondrites could be formed during the formation of chondrules and CAIs.

3:00 p.m. Fedkin A. V. * Grossman L.
Conditions for Making Type IIA Chondrules in Nebular Shocks **[#2014]**
A kinetic evaporation model yields mineralogical, chemical and isotopic properties of Type IIA chondrules when used on a volatile-free precursor subjected to a 7 km/s shock wave in a system enriched in chondrules and in H_2O by factors of 300 and 200, respectively.

3:15 p.m. Grossman J. N. * Alexander C. M. O'D. Ash R. D. McDonough W. F.
Volatile Element Abundances in Chondrules Revisited: An LA-ICP-MS Study of QUE 97008 (LL3.05) **[#2000]**
The interiors of chondrules from QUE 97008 (LL3.05) were analyzed for 36 elements, including Rb, Cs, Bi, Pb, Zn, and Se, by LA-ICP-MS. Even the type I chondrules show only modest depletions in volatiles, constraining models for their formation.

3:30 p.m. Alexander C. M. O'D. * Grossman J. N. Ebel D.
Do We Need to Reassess the Formation Conditions of Chondrules? **[#2012]**
The change of alkali contents of chondrules during cooling recorded in radial zonation in olivine phenocrysts is much smaller than predicted for chondrule formation under canonical nebular conditions and is roughly consistent with closed system crystallization.

3:45 p.m. Wasson J. T. * Rubin A. E.
Implications of Textural Distributions for Chondrule Formation: A Survey of CR Chondrules **[#2312]**
The common (>95% low-FeO) chondrules in CR chondrites have two main textures: round shapes with minimal interior metal, and irregular shapes with abundant, small, interior metal. These reflect large differences in degree of melting, and thus in mean maximum temperature.

4:00 p.m. Berlin J. * Jones R. H. Brearley A. J.
A Closer Look at Chondrules and Matrix in Kakangari: Evidence for Wide-Spread Reduction and Sulfurization **[#2395]**
We are presenting new data for bulk chemical compositions of chondrules and mineralogical observations that show evidence for wide-spread reduction and sulfurization in Kakangari.

4:15 p.m. Hezel D. C. * Palme H.
Pre-Accretionary Distribution of Ca and Al Between Matrix and Chondrules in CV Chondrites **[#1667]**
Ca/Al-ratios in Y-86751 (CV) chondrules are super- and in matrix sub-chondritic. The opposite is true for Allende and Efremovka. Incorporation of spinel in Allende and Efremovka chondrule precursors in a nebular setting can explain this observation.

4:30 p.m. Miura H. * Nakamoto T. Masao D.
Shock-Wave Heating Model for Chondrule Formation: Origin of Chondrule Shapes **[#1505]**
We report that a rotating viscous droplet (chondrule precursor) exposed to the high-velocity gas flow becomes prolate shape with an appropriate rotation speed. Our results show a good agreement with the external shapes of prolate chondrules.

4:45 p.m. Acton G. * Yin Q.-Z. Verosub K. L. Ebel D. S.
Magnetic Fields of the Early Solar System Recorded in Chondrules and Meteorites: Insights from Magnetic Remanence and First-Order Reversal Curve (FORC) Measurements **[#1711]**
To provide information about the magnitude of early magnetic fields and physical and chemical conditions of the solar system, we determine the magnetic properties of 32 chondrules from the Allende, Karoonda, and Bjurbole meteorites and bulk samples from Murchison and Acfer-139 meteorites.