

Thursday, March 13, 2008
CHONDRULES AND CHONDRULE FORMATION
1:30 p.m. Crystal Ballroom B

Chairs: S. B. Simon

H. C. Connolly Jr.

- 1:30 p.m. Libourel G. * Chaussidon M. Krot A. N.
Constraints on the Origin of Magnesian Chondrules and on the Gaseous Reservoirs in the Early Solar System: An Oxygen Study [#2017]
 A survey of the oxygen isotopic composition of the major silicate phases in magnesian chondrules shows that most of the olivines are relict grains and that gas-melt interaction played a major role in the chondrule crystallization history.
- 1:45 p.m. Whattam S. A. * Hewins R. H.
Origin of PO Chondrules from Thermally Annealed Granoblastic Olivine Aggregates [#1748]
 Clasts of GOA break up rapidly when heated isothermally and olivine shows reverse zoning. Cooling at 10–100°C/hr gives porphyritic textures with normally zoned olivine. Whether GOA are planetary or nebular they represent potential chondrule precursors.
- 2:00 p.m. Scott E. R. D. * Sanders I. S.
Carbonaceous Chondrite Mn-Cr Isochron: Implications for Chondrule Formation and the Early Fractionation of Moderately Volatile Elements [#2065]
 Published bulk rock Mn-Cr isochrons for CC at 4568 ± 1 m.y. predate chondrule formation by 1.5–5 m.y. Survival of Mn-poor reservoirs of nebular dust for this period seems implausible. We invoke refractory planetesimals as precursors for CC chondrules.
- 2:15 p.m. Simon S. B. * Sutton S. R. Grossman L.
Constraints on the Oxidation State of Chondrule Precursors from Titanium XANES Analysis of Semarkona Chondrules [#1352]
 The valence of Ti is not easily reset during chondrule formation. To investigate the oxidation state of chondrule precursors, we measured the valence of Ti in olivine, pyroxene and mesostasis in a type I and a type II chondrule in Semarkona.
- 2:30 p.m. Ma C. * Beckett J. R. Connolly H. C. Jr. Rossman G. R.
Aluminous Spinel in Ferromagnesian Chondrules from Allende [#2030]
 Aluminous low-Cr spinels in Allende ferromagnesian chondrules generally formed *in-situ* and are not relict grains derived from CAIs or previous generations of Al-rich or ferromagnesian chondrules.
- 2:45 p.m. Connolly H. C. Jr.* Huss G. R. Nagashima K. Weisberg M. K. Ash R. D. Ebel D. S. Schrader D. L. Laurretta D. S.
Oxygen Isotopes and the Nature and Origins of Type-II Chondrules in CR2 Chondrites [#1675]
 In this abstract we broaden our previous database for the O-isotopic composition of olivines from CR2, type II chondrules with the implication that some of these chondrules may be related to or are type II chondrules from ordinary chondrites.
- 3:00 p.m. Berlin J. * Jones R. H. Brearley A. J.
Fe/Mn Systematics of Chondrule Olivine: Significant Differences Between Type II Chondrules in CO, CR, and Ordinary Chondrites [#2490]
 Olivine compositions in type II chondrules show significantly different trends in Fe-Mn-Mg plots for OC and CO chondrites. CR chondrites show two distinct populations with properties intermediate between OC and CO chondrites.

- 3:15 p.m. Kropf A. * Pack A.
Closed System Behavior of Chondrules— New Constraints for the Chondrule Forming Process [#2222]
We present chemical data on chondrules that suggest a primordial origin of alkalis and a closed system behavior of chondrules. Implications for the timing and the environment for chondrule forming processes will be presented.
- 3:30 p.m. Grossman J. N. * Alexander C. M. O'D.
Evidence for the Presence of Alkalis at High Temperatures in Type II Chondrules in Ordinary Chondrites [#2084]
Type II chondrules in Semarkona formed as relatively simple igneous systems. Na contents varied, but were generally high during the entire cooling history. However, the chondrules were likely open to Na loss or gain at low temperatures.
- 3:45 p.m. Alexander C. M. O'D. * Ebel D. S. Ciesla F. J. Grossman J. N.
Reassessing the Conditions of Chondrule Formation [#2440]
It has been demonstrated that chondrules were essentially closed to Na loss even at peak temperatures. We use this observation to show that chondrules must have formed at much higher solid densities than previously thought.
- 4:00 p.m. Gordon S. H. * Zanda B. Bland P. A. Rogers N. W. Charlier B. L. A.
Trace and Minor Element Composition for Individual Semarkona Chondrules [#2034]
Solution ICP-MS determinations for >32 elements from individual, well characterised Semarkona chondrules. Coarse grained chondrules are less abundant in volatile elements than fine grained. Type I and II chondrules have very similar compositions.
- 4:15 p.m. Jones R. H. * Norman M. D.
Trace Elements in Aluminum-rich Chondrules from the Mokoia CV Chondrite [#2051]
Two Al-rich chondrules have fractionated, group II REE abundance patterns. CAI-like precursor material was completely melted during chondrule formation. One chondrule has a high Th/U ratio, comparable to the highest Th/U ratios measured in CAIs.
- 4:30 p.m. Fedkin A. V. * Ciesla F. J. Grossman L.
Shock Wave Models: Dependence of Thermal History and Type II Chondrule Composition on Water and Dust Enrichment [#1834]
P-T-time histories of matter in nebular shock waves, and consequent mineralogical evolution of chondrule precursors, are affected by water and dust enrichments needed to account for the oxidation state and isotopic compositions of Type II chondrules.
- 4:45 p.m. Hood L. L. * Ciesla F. J. Artemieva N. A. Weidenschilling S. J.
Nebular Shock Waves Generated by Large-Scale Impacts: Possible Sites for Chondrule Formation [#2147]
Nebular shock waves can be generated by large-scale impacts in the primordial asteroid belt that would have been most numerous following the formation of Jupiter. We investigate their possible role in chondrule formation.