Monday, March 17, 2003
THE WRATH OF KHANDRULES
8:30 a.m. Marina Plaza Ballroom

Chairs: D. S. Ebel
H. C. Connolly

Ciesla F. J. * Hood L. L.
Evaluating Planetesimal Bow Shocks as Possible Sites for Chondrule Formation **[#1400]**
We present detailed simulations for the thermal processing of solids by bow shocks produced by supersonic planetesimals in the solar nebula and compare the results to the thermal evolution inferred for chondrules.

Tsuchiyama A. * Shigeyoshi R. Kawabata T. Nakano T. Uesugi K. Shirono S.
Three-Dimensional Structures of Chondrules and Their High-Speed Rotation **[#1271]**
3-D structures of 20 chondrules obtained by X-ray microtomography strongly suggest that oblate and prolate chondrules were formed by high-speed rotation of 50–350 rps or more. This is consistent with the shock wave model for chondrule formation.

Ebel D. S. * Engler A. Kurat G.
Pyroxene Chondrules from Olivine-depleted, Dust-enriched Systems **[#2059]**
Some rapidly quenched pyroxene chondrules have flat REE patterns. Only >70% depletion in a principal component of nebular dust, forsterite, in dust-rich systems, makes opx + liquid, without olivine, thermodynamically stable at P = one millibar.

Kunihiro T. Rubin A. E. McKeegan K. D. Wasson J. T.
Initial $^{26}Al/^{27}Al$ Ratios in Carbonaceous Chondrite Chondrules **[#2124]**
We studied the Al-Mg system in one of the most primitive carbonaceous chondrites, CO 3.0 Yamato 81020. Here we report a preliminary result.

Varley L. R. * Leshin L. A. Guan Y. Zanda B. Bourot-Denise M.
Oxygen Isotopic Composition of Renazzo Chondrule Olivine and Comparison with Extent of Chondrule Melting **[#1899]**
New oxygen isotopic data for Renazzo chondrules, including the first CR chondrule with olivine ^{16}O-enrichment similar to CAIs, are reported and compared with extent of chondrule melting. The less melted chondrules are on average more ^{16}O-rich.

Krot A. N. * Libourel G. Goodrich C. A. Petaev M. I. Killgore M.
Silica-rich Igneous Rims Around Magnesian Chondrules in CR Carbonaceous Chondrites: Evidence for Fractional Condensation During Chondrule Formation **[#1451]**
Type I chondrules in CRs are surrounded by silica-rich igneous rims which may have formed by gas-solid condensation of SiO_2-rich materials onto chondrule surfaces and subsequent incomplete melting, or by direct SiO condensation into chondrule melts.

Libourel G. * Krot A. N. Tissandier L.
Evidence for High Temperature Condensation of Moderately-volatile Elements During Chondrule Formation **[#1558]**
A systematic study of the moderate-volatile element distribution in Type I chondrules from unequilibrated ordinary and CR chondrites shows evidences for high temperature processing of chondrules via interactions with a fractionated nebular gas.

Connolly H. C. Jr.* Weisberg M. K. Huss G. R.
On the Nature and Origins of FeO-rich Chondrules in CR2 Chondrites: A Preliminary Report **[#1770]**
We present a progress report on the petrology and oxygen isotopic composition of FeO-rich chondrules from CR chondrites. The objects show wide variation in the $\Delta^{17}O$ compared to type I chondrules suggesting multiple sources. The history of type II chondrules appears more complex than type I.

Wasson J. T. * Rubin A. E.
High Cooling Rates of Type-II Chondrules: Limited Overgrowths on Phenocrysts Following the Final Melting Event **[#2119]**
Type-II porphyritic chondrules appear to have cooled at rates »1 K/s, much larger than rates inferred from furnace experiments.

Ruzicka A. * Floss C.
Relict Forsterite and Igneous Olivine Grains in Chainpur (LL3.5) Chondrules: Major- and Trace-Element Evidence for Vapor-Fractionation and Igneous Partitioning **[#1243]**
SIMS analyses of relict and igneous olivine grains in Chainpur chondrules provide evidence for vapor-fractionation and igneous partitioning during rapid cooling of chondrules.

Engler A. * Kurat G. Sylvester P. J.
Trace Element Abundances in Micro-Objects from Tieschitz (H3.6), Krymka (LL3.1), Bishunpur (LL3.1) and Mezö-Madaras (L3.7): Implications for Chondrule Formation **[#1689]**
Bulk trace element analyses of nonporphyritic micro-objects from Type 3 ordinary chondrites indicate that condensation of liquids from vapors is a possible chondrule formation process during which metasomatic events probably played an important role.

Kobayashi S. Imai H. Yurimoto H. *
An Extreme ^{16}O-rich Chondrule from Acfer 214 CH Chondrite **[#1536]**
An extreme ^{16}O-rich chondrule of $\delta^{17,18}O_{SMOW} \cong -75‰$ was found from Acfer 214 chondrite. This discovery suggests that chondrule precursors were originally enriched in ^{16}O than CAI precursors.

Grossman J. N. * Brearley A. J.
Cryptic Metamorphic Effects in Chondrules from Highly Unequilibrated Ordinary Chondrites: An Insidious Parent-Body Process **[#1584]**
During the early stages of parent-body metamorphism, alkalis enter the mesostasis of chondrules and albite crystallizes. As albite forms, K/Na of coexisting glass rises. Even type 3.0 chondrites have been affected by these metamorphic processes.