

Wednesday, March 25, 2009

CAIs AND CHONDRULES: RECORDS OF EARLY SOLAR SYSTEM PROCESSES

8:30 a.m. Waterway Ballroom 5

Chairs: **Kim B. Knight**
Harold C. Connolly Jr.

- 8:30 a.m. Simon S. B. * Sutton S. R. Grossman L.
[*First Ti-XANES Analyses of Refractory Inclusions from Murchison*](#) [#1626]
Ti valence in refractory phases is an important recorder of redox conditions in the early solar nebula. We report the valence of Ti in pyroxene, spinel and hibonite in spinel-hibonite and spinel-pyroxene inclusions and in a coarse hibonite grain.
- 8:45 a.m. Ma C. * Beckett J. R. Rossman G. R.
[*Allendeite and Hexamolybdenum: Two New Ultra-Refractory Minerals in Allende and Two Missing Links*](#) [#1402]
We report here two newly discovered ultra-refractory minerals from Allende: Allendeite, $\text{Sc}_4\text{Zr}_3\text{O}_{12}$, a new Sc- and Zr-rich oxide; and hexamolybdenum, (Mo,Ru,Fe), a Mo-dominant alloy.
- 9:00 a.m. Knight K. B. * Kita N. T. Davis A. M. Richter F. M. Mendybaev R. A.
[*Mg and Si Isotope Fractionation Within Three Type B Ca-Al-rich Inclusions*](#) [#2360]
Isotopic profiles of Mg and Si in melilite were measured within three Type B Ca-Al-rich inclusions from the CV3 chondrites Allende (USNM-3529.16 and AL-4884) and Leoville (USNM-3535.1) by secondary ion mass spectrometry.
- 9:15 a.m. Mendybaev R. A. * Richter F. M. Georg R. B. Davis A. M.
[*Evaporation Kinetics of Forsterite-rich Melts and Thermal Histories of FUN CAIs*](#) [#2461]
We present the results of our experiments on evaporation kinetics of forsterite-rich melts in vacuum. The results are used to place constraints on the thermal history of FUN CAIs.
- 9:30 a.m. Krot A. N. * Nagashima K.
[*Isotopically Uniform, \$^{16}\text{O}\$ -Depleted CAIs in Metal-Rich Carbonaceous Chondrites.*](#) [#1036]
The metal-rich carbonaceous chondrites (CH, CB, and Isheyevo) contain a population of igneous CAIs, which are isotopically uniform and ^{16}O -depleted [$\Delta^{17}\text{O} \sim -7\%$] compared to CAIs from other chondrite groups ($\Delta^{17}\text{O} \sim -23.5\%$), suggesting a unique origin.
- 9:45 a.m. Petaev M. I. * Jacobsen S. B.
[*Nebular History of the Allende FoB CAI SJ101*](#) [#1388]
We compare petrologic and chemical characteristics of a unique FoB CAI SJ101 with the results of thermodynamic modeling of condensation of its precursors in a system of solar composition and speculate about nebular formation history of this CAI.
- 10:00 a.m. Richter F. M. * Mendybaev R. A. Christensen J. Gaffney A. Ebel D.
[*Elemental and Isotope Fractionation of Chondrule-like Liquids by Evaporation into Vacuum*](#) [#2321]
The talk will present new experimental data on the evaporation kinetics of Na and K from a chondrule-like melt, and new isotopic data on the K isotopic fractionation of the evaporation residues.
- 10:15 a.m. Kropf A. Huss G. R. Krot A. N. Pack A. *
[*Closed System Behavior of Alkalis in Type-I Chondrules — Understanding Chondrules as Igneous Systems*](#) [#2464]
New SIMS and high-current EPMA data on type-I chondrules from Semarkona show that they behaved as chemically closed systems during melting and olivine crystallization.

- 10:30 a.m. Weisberg M. K. * Ebel D. S. Connolly H. C. Jr. Kita N. T. Ushikubo T.
[*Petrologic-Geochemical Study of Chondrules in Enstatite Chondrites*](#) [#1886]
Chondrules in E3 chondrites differ markedly from chondrules in other chondrites. They are records of a highly reducing nebular environment and/or precursor assemblage. Oxygen isotope data is being collected to better constrain their history.
- 10:45 a.m. Ushikubo T. * Kimura M. Kita N. T. Valley J. W.
[*Oxygen Isotopic Compositions of Phenocrysts in Chondrules from the Primitive Carbonaceous Chondrite Acfer 094*](#) [#1383]
We measured O isotopic compositions of 29 chondrules from Acfer 094. We found ^{16}O -poor relict olivine from 3 chondrules, suggesting that their precursors formed in a ^{16}O -poor environment and were processed in a relatively ^{16}O -rich environment.
- 11:00 a.m. Berlin J. * Jones R. H. Brearley A. J.
[*Identification of FeO-rich Relict Olivines in Type IIA Chondrules Using Fe-Mn Systematics*](#) [#2399]
We identified FeO-rich relict olivines in type IIA chondrules from Kainsaz (CO3.2) and Semarkona (LL3.0). Host chondrule olivines show linear trendlines in a Mn vs. Fe diagram, while relict grains plot in different regions of the diagram.
- 11:15 a.m. Nakashima D. * Matsuda S. Iio H. Bajo K. Nagao K.
[*Solar Wind Like Noble Gases in a Chondrule in the NWA 852 CR2 Chondrite*](#) [#1674]
We found through laser extraction noble gas analysis of the NWA 852 CR2 chondrite that a chondrule contains solar wind like noble gases in its interior, suggestive of solar gas acquisition before/during the chondrule formation.
- 11:30 a.m. Hezel D. C. * Armytage R. M. G. Georg R. B. Keren E. Russell S. S.
[*Combined Fe- and Si-Isotope Measurements of CV Chondrite Chondrules and CAIs*](#) [#1772]
Chondrules have variable Fe-isotopic, but similar Si-isotopic compositions. 3D tomography revealed 1–7 vol% sulfide/metal in Allende. We conclude that isotopic and chemical variabilities among chondrules were established during chondrule formation.
- 11:45 a.m. Schrader D. L. * Zega T. J. Lauretta D. S. Connolly H. C. Jr.
[*Microstructure of Sulfide-Assemblages in a Renazzo Type-II Chondrule as Revealed by Transmission Electron Microscopy*](#) [#2181]
We report on a combined focused ion beam scanning electron microscopy and transmission electron microscopy analysis of the microstructure of sulfide-assemblages in a type-II chondrule from Renazzo.