Tuesday, March 24, 2009
CHONDRITE PARENT-BODY PROCESSES
1:30 p.m. Waterway Ballroom 5

Chairs: Adrian Brearley
Molly McCanta

1:30 p.m. Grossman J. N. * Rubin A. E. Sears D. W. G.
The Mineral Compositions and Classification of High Type-3 and Type-4 Ordinary Chondrites [#1679]
The type 3/4 and 4/5 boundaries in ordinary chondrites are poorly defined; literature classifications may be inaccurate. Mineralogical trends across type 4 will permit better classification and improved understanding of asteroidal thermal histories.

Metamorphism of Ordinary Chondrites at the Type-3/Type-4 Boundary [#1122]
A multidisciplinary study of ordinary chondrites at the type 3.7 to type 3/type 4 boundary is being undertaken to understand metamorphism in this little-studied range. Results for the first 11 samples will be discussed.

2:00 p.m. Brearley A. J. *
Matrix Olivines in the Metamorphosed CK Chondrite NWA 1628: Possible Affinities to Olivines in the Matrices of Oxidized CV3 Chondrites and Dark Inclusions [#1791]
Matrix olivines in NWA 1628 contain voids and inclusions of sulfides and are similar to matrix olivines in the Allende CV3 chondrite. Rare phyllosilicate phases are also present, indicating fluids played a role in the formation of the olivine grains.

2:15 p.m. McCanta M. C. * Beckett J. R. Stolper E. M.
Phosphorus Zonation in H Chondrite Olivines: The Effects of Increasing Petrologic Grade [#2048]
Olivines in type IIA chondrules in H chondrites were mapped to study the effects of thermal processing on phosphorus zonation. While zoned grains were found in meteorites of all petrologic grades, changes in their spatial distribution were observed.

2:30 p.m. Sharp T. G. * Trickey R. Xie Z. DeCarli P. S.
Ringwoodite Microstructures in L-Chondrites RC 106 and Acfer 040: Implications for Transformation Mechanisms [#2541]
The transformation of olivine to ringwoodite is important because the transformation kinetics can be used to constrain shock duration. Here we examine the microstructures in ringwoodites from L chondrites RC 106 and Acfer 040 to better understand transformation mechanisms.

2:45 p.m. Abreu N. M. * Stanek G. L.
Chemical and Petrologic Evidence of Extensive and Complex Aqueous Alteration of the CR GRA 06100 [#2393]
GRA 06100 is a CR chondrite containing partially to completely oxidized kamacite and taenite. However, its alteration style differs significantly from CR1 GRÖ 95577.

3:00 p.m. Alexander C. M. O’D. * Newsome S. N. Fogel M. L. Cody G. D.
Deuterium Enrichments — Parent Body Products or a Question of Preservation? [#2546]
Large D and 15N in OC and CM IOM correlate with parent body metamorphism/alteration conditions suggesting there may have been previously unrecognized fractionation processes at work.

3:15 p.m. Tyra M. A. * Brearley A. J. Hutcheon I. D. Ramon E. Matzel J. Weber P.
Carbonate Formation Timescales Vary Between CM1 Chondrites ALH 84051 and ALH 84034 [#2474]
We use nanoSIMS to examine 53Mn in carbonates of chondrites ALH 84051 and ALH 84034. Values obtained support early and prolonged aqueous alteration within their parent body.
de Leuw S. *  Rubin A. E.  Schmitt A. K.  Wasson J. T.  
Mn-Cr Systematics for the CM2.1 Chondrites QUE 93005 and ALH 83100: Implications for the Timing of Aqueous Alteration [1794] 
Little is known about the timescale of alteration processes on the CM parent body. We studied two CM2.1 chondrites, QUE 93005 and ALH 83100, and compared the data with previous studies. The results imply that alteration lasted at least 4 Ma.

Petitat M. *  McKeegan K.  Gounelle M.  Mostefaoui S.  Marrocchi Y.  
Duration and Sequence of Carbonate Crystallization on the Orgueil Protolith: 53Mn-53Cr Systematics of their Evolution in O and C Isotopic Evolution [1657] 
We present a NanoSims 53Mn-53Cr systematics of 8 breunnerites and 3 dolomites previously studied for $\delta^{18}O$ and $\delta^{13}C$ to constrain the duration and sequence of carbonate crystallization on the Orgueil protolith.

Cody G. D. *  Heying E.  Alexander C. M. O’D.  
A Post Accretionary Origin for Meteoritic and Cometary Organic Solids? [2325] 
Recent molecular analyses of meteoritic and cometary organics and supporting experiments suggest a common origin for both being derived from a formaldehyde sourced sugar-like precursor. Extraterrestrial organic solids may have formed post accretion.

Herd C. D. K. *  Nittler L. R.  Alexander C. M. O’D.  
Isotopically Heterogeneous Organic Matter in the Tagish Lake Meteorite [1818] 
NanoSIMS analysis of fragments from two lithologies within the Tagish Lake carbonaceous chondrite shows significant nanoscale N, H and C isotopic variation, providing possible new insights into the source and processing of primitive organic matter.

Remusat L. *  Guan Y.  Eiler J. M.  
Organic Constituents in Carbonaceous Chondrites: Evidence for Preservation of Pristine Particles of Mixed Origins [1294] 
Organic matter in carbonaceous chondrites occurs as sub-micron particles. Some of these particles have been subjected to intense irradiation in the early solar system. This indicates important mixing processes during this time.