

Thursday, March 26, 2009
CHONDRITE ACCRETION AND EARLY HISTORY
1:30 p.m. Waterway Ballroom 5

Chairs: Denton Ebel
 Rhiannon Mayne

- 1:30 p.m. Howard K. T. * Benedix G. K. Bland P. A. Cressey G.
[*Modal Mineralogy of CV3 Chondrites by PSD-XRD: Mineralogic Insights into a Complex Evolutionary History*](#) [#1235]
 CV3 chondrites Vigarano, Efremovka, Allende, Mokoia, Grosnaja and Kaba are amongst the most studied rocks in existence. By XRD we define the first quantitative modal mineralogy of these samples and explore implications of our data to petrogenesis.
- 1:45 p.m. Ebel D. S. * Leftwich K. Brunner C. E. Weisberg M. K.
[*Abundance and Size Distribution of Inclusions in CV3 Chondrites by X-Ray Image Analysis*](#) [#2065]
 Chondrule, matrix, CAI and AOA abundances and log-normal clast size distributions for Allende, Mokoia, Nova 002, Leoville and Vigarano are determined with a new technique. Oxidized CVs have ~2× matrix and ~50% chondrule area compared to reduced CVs.
- 2:00 p.m. Zanda B. * Bland P. A. Le Guillou C. Hewins R. H.
[*Volatile Element Distribution in Matrix and Chondrules of Carbonaceous and Ordinary Chondrites*](#) [#1810]
 Presolar diamond, H₂O, C, N and volatiles in OCs and CCs correlate with matrix abundance. Matrix accreted with a uniform composition throughout chondrite groups for the first four species, but chondrule-matrix complementarity is possible for volatiles.
- 2:15 p.m. Kunihiro T. * Maruyama S. Watanabe M. Nakamura E.
[*Elemental and Isotopic Abundances of Lithium in Chondrule Constituents in the Allende Meteorite*](#) [#1500]
 We report data on the distribution of Li elemental and isotopic abundances in chondrule constituents and in the neighboring matrix of the Allende meteorite.
- 2:30 p.m. Weiss B. P. * Carporzen L. Elkins-Tanton L. T. Ebel D. S.
[*Evidence for Internally Generated Magnetic Fields on the CV Chondrite Parent Planetesimal*](#) [#2237]
 Paleomagnetic analyses of Allende suggest that the CV parent body generated a dynamo field in a convecting metallic core. This would imply that the parent planetesimal is partially differentiated and has a relic, chondritic surface.
- 2:45 p.m. Nimmo F. *
[*Energetics of Asteroid Dynamos and the Role of Compositional Convection*](#) [#1142]
 Asteroid dynamos require core cooling rates of < 0.1 K/Myr if compositional convection driven by a light element (e.g., sulphur) occurs, but 1–100 K/Myr otherwise. Parent bodies of several existing meteorites cooled fast enough to generate dynamos.
- 3:00 p.m. Elkins-Tanton L. T. * Weiss B. P.
[*Chondrites as Samples of Differentiated Planetesimals*](#) [#1293]
 The physical and compositional effects of an internal magma ocean on the solid, undifferentiated outer shell of a planetesimal provides a starting model from which to explain a variety of observations of chondrite meteorites.

- 3:15 p.m. Hewins R. H. * Ganguly J. Mariani E.
[*Diffusion Modeling of Cooling Rates of Relict Olivine in Semarkona Chondrules*](#) [#1513]
Diffusive exchange profiles between relict olivine and melt-grown olivine in Semarkona Type IIA chondrules were oriented by EBSD to correct D. Results for Fe-Mg (D from Dohmen) and Cr (Ito and Ganguly) are concordant at 300°–400°C/hr.
- 3:30 p.m. Wittmann A. * Weirich J. R. Swindle T. D. Rumble D. III Kring D. A.
[*Petrography of MIL05029, the First Accretional Impact Melt from the L-Chondrite Parent Body*](#) [#1426]
Petrographic characteristics, radioisotopic age, and the thermal history of MIL05029, an igneous rock with L-chondritic affinity, suggest formation as an impact melt in a 15–60 km diameter crater during accretion of the L-chondrite parent body.
- 3:45 p.m. Mayne R. G. * McCoy T. J.
[*Metamorphism and Melting in an “Unmetamorphosed” Mesosiderite*](#) [#1728]
We present SEM and EMP analyses from two silicate clasts within Crab Orchard specifically to compare the degree of metamorphism of these clasts to similar clasts in eucrites and to understand the igneous processes that occurred upon mixing with the metal.
- 4:00 p.m. Rubin A. E. *
[*Shock Effects in EH6 Chondrites and Aubrites: Implications for Collisional Heating of Asteroids*](#) [#1353]
Many EH4–EH7 chondrites have been impact melted, implying that collisional heating is responsible for EH-chondrite metamorphism. Two aubrites show evidence of post-shock annealing, a process that appears to be common among asteroids.
- 4:15 p.m. Humayun M. * Keil K. Bischoff A.
[*Siderophile Elements in Metal from Northwest Africa 2526, an Enstatite Chondrite Partial Melt Residue*](#) [#1744]
Siderophile elements confirm that metal in NWA 2526, an enstatite chondrite partial melt residue, equilibrated with C- and S-bearing metallic liquids, and provide a chemical link to Si-bearing iron meteorites.
- 4:30 p.m. van Niekirk D. * Humayun M. Keil K.
[*In Situ Determination of Siderophile Trace Elements in EL3 Meteorites*](#) [#2049]
Siderophile elements in kamacite from Metal-Silicate-Sulfide assemblages from EL3 chondrites confirm that these assemblages formed as partial melts, not nebular condensates, supporting an origin as impact melts.