

Thursday, March 13, 2008
POSTER SESSION II: NONCHONDRITIC METEORITES
6:30 p.m. Fitness Center

Greenwood R. C. Franchi I. A. Gibson J. M.

How Useful are High-Precision $\Delta^{17}O$ Data in Defining the Asteroidal Sources of Meteorites?: Evidence from Main-Group Pallasites, Primitive and Differentiated Achondrites [#2445]

High-precision oxygen isotope analysis is capable of revealing important information about the relationship between different meteorite groups. New data confirm that the main-group pallasites are from a distinct source to either the HEDs or mesosiderites.

Dobrica E. Moine B. Poitrasson F. Toplis M. J. Bascou J.

Rare Earth Element Insight into the Petrologic Evolution of the Acapulcoite-Lodranite Parent Body [#1327]

In this study we present petrological and geochemical constraints on the evolution of the acapulcoite-lodranite (A-L) parent body with emphasis on new rare earth element (REE).

Bascou J. Dobrica E. Maurice C. Moine B. Toplis M. J.

Texture Analysis in Acapulco and Lodran Achondrites [#1317]

EBSD-measured lattice-preferred orientation of minerals of both Acapulco and Lodran achondrites have been analyzed and combined with petrological and geochemical investigations providing new constraints on the melt extraction and migration processes.

Rumble D. III Irving A. J. Bunch T. E. Wittke H. J. Kuehner S. M.

Oxygen Isotopic and Petrological Diversity Among Brachinites NWA 4872, NWA 4874, NWA 4882 and NWA 4969: How Many Ancient Parent Bodies? [#1974]

Brachinites, related ultramafic achondrites and Graves Nunataks 06128 may derive from an incompletely-heated, heterogeneous "planetary" parent body.

Petit M. Kleine T. Touboul M. Bourdon B. Wieler R.

Hf-W Chronometry of Aubrites and the Evolution of Planetary Bodies [#2164]

We present the first Hf-W data for aubrite metals and silicates in order to better constrain the chronology of aubrites and to constrain the origin of their metals.

Connelly J. N. Amelin Y. Bizzarro M. Thrane K. Baker J. A.

The Pb-Pb Age of Angrite SAH 99555 Revisited [#2386]

Employing two different Pb-Pb dating methods, we have independently derived overlapping ages of 4564.58 ± 0.14 Ma and 4564.86 ± 0.38 Ma for angrite SAH 99555. We discuss the model dependency of these ages.

Izawa M. R. M. Wright A. J. McCausland P. J. A. Flemming R. L. Muirhead D. K. Parnell J.

Combined In Situ Micro X-Ray Diffraction and Raman Study of Carbonaceous Matter in Ureilites and Terrestrial Materials [#1459]

In situ μ XRD and Raman microspectroscopy have been applied to carbonaceous material in two ureilite and four terrestrial samples. This reconnaissance provides context and impetus for other, more invasive analytical techniques.

Moynier F. Yin Q.-Z. Gillet P. Beck P. Ferroir T. Barrat J. A. Albarede F.

The Isotope Geochemistry of Zn and Cr in Ureilites [#1444]

We measured the Cr and Zn stable isotope compositions of nine ureilite samples. Both Cr and Zn isotopic ratios are negatively correlated with their respective concentrations. These results may reflect isotopic fractionations during volatile loss.

Gardner-Vandy K. G. Lauretta D. S. Killgore M. Franchi I. A. Greenwood R. C.

Tafassasset: The Saga Continues [#2307]

In this study, we compare data for two separate Tafassasset stones and supply new oxygen isotope data for our sample. We include a discussion of the debate surrounding the classification of Tafassasset and offer a hypothesis for its origin based upon new information.

Liu Y. Taylor L. A. Richard R. D. Day J. M. D.

Mineralogy and Petrography of a Strange Achondrite GRA 06129 [#1830]

This report describes the unusual mineralogy and petrography of achondrite GRA 06129. A comparison with other achondrites was also made.

Mikouchi T. Miyamoto M.

Mineralogy and Pyroxene Cooling Rate of Unique Achondritic Meteorite GRA 06129 [#2297]

We report mineralogy and pyroxene cooling rate of unusual achondrite GRA 06129. This equilibrated rock is a new type of Fe-rich achondrite whose origin is still unknown. Pyroxene exsolution occurred at 15–20 m from the surface of its parent body.

Elkins-Tanton L. T. Maroon E. Krawczynski M. J. Grove T. L.

Magma Ocean Solidification Processes on Vesta [#1364]

The small size of Vesta creates significant physical differences in magma ocean solidification and overturn from those of a larger planet, and these differences may help explain the compositional paradoxes of eucrites and diogenites.

Elkinton H. D. Jones J. H. Dyar M. D. Le L. Filiberto J.

Differentiation of the HED Parent Body and an Evaluation of the MELTS Computational Program [#2093]

An evaluation of MELTS ability to predict accurately the phase compositions and modes of melting experiments performed on an HED parent-body bulk composition will be presented.

Barrat J. A. Bohn M. Gillet Ph. Yamaguchi A.

Impact Glasses in Howardites: Evidences for K-rich Lithologies on 4-Vesta [#1589]

K-rich impact glasses (some with a granitic composition) found in howardites, demonstrate that in addition to basalts and ultramafic cumulates, K-rich rocks are exposed on the surface of 4 Vesta..

Rieck K. D. Hervig R. Sharp T. G.

Lithium Isotope Analysis of Eucrite Minerals: Implications for Thermal History of 4 Vesta [#1937]

We present data on $\delta^7\text{Li}$ variability in pyroxene and plagioclase crystals from the eucrite meteorites Pasamonte and Juvinas, as measured by secondary ion mass spectrometry, for the purpose of better understanding the thermal history of these basalts.

Mayne R. G. Jaret S. J. McSween H. Y. Jr.

Crystal Size Distribution in the Unbrecciated Eucrites: A Preliminary Study [#1470]

Initial results from textural analysis of the unbrecciated eucrites will be presented, with a view to gain a deeper understanding into the crystallization conditions that exist with the upper crust of Vesta.

Jaret S. J. Mayne R. G. McSween H. Y. Jr.

Demystifying Crystal Size Distribution (CSD): A Comparison of Methodologies Using Eucrite Meteorites [#1487]

Crystal size distribution (CSD) of eucrite meteorites was performed using three methods of converting 2D thin section measurements into 3D estimates. Methods were compared to determine the effect of 3D correction on interpretation of growth history.

Madiedo J. M. Trigo-Rodriguez J. M. Llorca J. Borovicka J. Zamorano J. Izquierdo J. Ocaña F.

The Puerto Lapice Eucrite Fall Phenomenon [#1815]

The fall of the Puerto Lapice eucrite, which occurred on May 10, 2007, is analyzed here. This impressive daylight bolide was witnessed by thousands of people from Spain and is being carefully studied by the Spanish Meteor and Fireball Network (SPMN).

Beck A. W. McSween H. Y.

Fe and Mn Systematics in Olivine-bearing Diogenites [#1291]

Olivine-bearing diogenites provide the means to discern a ratio of Fe/Mn in olivine from Vesta. They also allow the testing of petrogenetic relationships between olivine-bearing and non olivine-bearing diogenites through the examination of Fe/Mn in pyroxene.

Shearer C. K. Burger P. V. Papike J. J.

Olivine Diogenites and QUE 93148. Remnants of the HED Parent Body Mantle? [#1835]

Explores if a petrogenetic relationship exists among the diogenites, olivine diogenites, and QUE 93148 and if these lithologies represent mantle assemblages from either the HED or pallasite parent body.

Mittlefehldt D. W.

Meteorite Dunitite Breccia MIL 03443: A Probable Crustal Cumulate Closely Related to Diogenites from the HED Parent Asteroid [#1919]

The deep dark secrets of meteorite MIL 03443 will be disclosed.

Ashley J. W. Ruff S. W. Christensen P. R. Leshin L. A.

Thermal Emission Spectroscopy of Iron Meteorites on Earth and Mars — A Laboratory Evaluation of Meridiani Planum (Heat Shield Rock) [#2382]

This study focuses on the effects of dust on possible secondary alteration products which may conceivably be extant within regmaglypts on the surface of Meridiani Planum (formerly Heat Shield Rock), found by the Opportunity rover on Mars.

Cloutis E. A. Bailey D. T. Hardersen P. S.

Reflectance Spectra of Iron Meteorite Powders [#1082]

The reflectance spectra of iron meteorite powders and roughened slabs (hexahedrites, octahedrites, ataxites) all exhibit red-sloped spectra across the 0.35–2.5 μm range. This suggests that their parent bodies may not be spectrally distinguishable from one another.

Varela M. E. Zinner E. Kurat G.

Glasses in Tucson (IRUNGR): A SIMS Study [#1373]

We report the first trace element study of glasses from glass inclusions in olivines and mesostasis glasses occurring between phases in the Tucson iron meteorite.

Flemming R. L. McCausland P. J. A. Kissin S. A. Corcoran P. L. Biesinger M. C.

Lovina, a New Ataxite: Examination by μXRD , Petrography, SEM and INAA [#2412]

Lovina is a heavily-weathered ataxite with ziggurat-like projections and deep vugs. Micro-XRD, petrography, SEM and INAA confirmed it to be an ungrouped ataxite. Weathered ziggurats contained taenite, awaruite and magnetite.

Watson H. C. Watson E. B. McDonough W. F. Ash R. D.

Low Temperature Siderophile Element Partition Coefficients in Iron Meteorites [#2374]

We present a method to measure siderophile element partition coefficients between kamacite and taenite in iron meteorites at relatively low temperatures using laser ablation ICP-MS. A correlation of partition coefficients with atomic number is observed.

Yang J. Goldstein J. I. Scott E. R. D.

Thermal History and Origin of the Main Group Pallasites [#1938]

We present the new results about the metallic micro- and nano-structure, thermal history and origin of main group pallasites.

Stevens M. Buseck P. R.

Long Tubular Inclusions in Olivine in the Fukang Pallasite: A Glimpse into the Past? [#2157]

Olivine contains extended linear inclusions that are crystallographically oriented and filled with minerals rich in Cr, Al, and Ca, some with dendritic aspects. An epitaxial relation exists between host olivine and inclusion chromite.

Sano J. Ganguly J. Hervig R. Zhang X.-Y.

Neodymium Diffusion Kinetics in Orthopyroxene: Experimental Studies, Mineral Closure Temperature of Sm-Nd Decay System and Application to Mesosiderites [#1377]

We have determined Nd diffusion kinetics in orthopyroxene, and applied these data to calculate closure temperature of Sm-Nd decay system in the mineral, and to refine the cooling history of mesosiderites.