

Tuesday, March 24, 2009
POSTER SESSION I: PLANETARY DIFFERENTIATION
6:30 p.m. Town Center Exhibit Area

Kegler Ph. Holzheid A. McCannon C. Rubie D. C. Palme H.

[Pressure and Temperature Dependent Partitioning of Copper: Implications for Terrestrial Core Formation](#) [#1685]

To better understand the abundance of Cu in the Earth's mantle we studied the metal - silicate partitioning of Cu as function of P, T, silicate composition, and alloy composition (Cu, Fe, Ni, and C contents). The first results are presented here.

Yu G. Jacobsen S. B.

[Core Formation and the Fe/FeO Ratio of the Earth, Mars and Vesta: Constraints from the \$^{182}\text{Hf}\$ - \$^{182}\text{W}\$ System](#) [#2123]

A dynamic core-formation model with a deep magma ocean for the Hf-W system, which can match the partitioning of Ni, Co and W in mantles of Earth, Mars and Vesta and yield mean age of formation of these planets of 12, 8 and 3 Myr respectively.

Prissel T. Colson R. O.

[Additional Experiments Suggesting that Neutral Nickel is Soluble in Silicate Melts at Low Concentration](#) [#1172]

Metal nuggets occur in experiments run at low f_{O_2} in silicate systems. We find a correlation between quench rate and nugget size, suggesting nuggets form during quench and neutral nickel may be an important species during differentiation at low f_{O_2} .

Sharp Z. D. Draper D. S. Agee C. B.

[Core/Mantle Partitioning of Chlorine and a New Estimate for the Hydrogen Abundance of Earth](#) [#1209]

The core/mantle D value for chlorine was determined experimentally to be less than 0.01 at high P-T. Using mantle and crustal Cl abundances, and the H/Cl ratio of chondrites, the H content of Earth is estimated to be 2.8×10^{24} g or less.

Khan A. Connolly J. A. D.

[A Geophysical Perspective on the Major Element Composition of Mars' Mantle](#) [#1013]

We have inverted a set of areophysical data for Mars' mantle composition and core state, size and composition. We find an overall SNC-like mantle composition, with no transition to a lower mantle taking place as on Earth. Core radius and density are ~1680 km and ~6.7 g/ccm.

Elkins-Tanton L. T.

[Early Planetary Evolution: The Crust and Mantle Before Plate Tectonics](#) [#1298]

Magma ocean models that include small water contents predict a potentially important redistribution of mantle water, a "water catastrophe," after solidification. This event introduces fluid to the upper mantle and may speed onset of plate tectonics.

Gelman S. E. Elkins-Tanton L. T. Seager S.

[Mantle Thermal Evolution in Tidally-locked Super-Earths](#) [#1338]

We present a preliminary model of the mantle thermal evolution for tidally locked Super Earths and investigate the presence of magma ponds and liquid water/the habitable zone.

Duncan M. S. Agee C. B.

[Partial Molar Volume of \$\text{CO}_2\$ in Peridotite Partial Melt at High Pressure](#) [#1406]

Using the sink/float method with carbonated and non-carbonated peridotite partial melts, the partial molar volume of CO_2 is calculated at high pressure.

Riches A. J. V. Rogers N. W. Charlier B. L. A. Bodinier J.-L.

[The Earth as a Planet: The Re-Os Isotope Evolution of Bulk Silicate Earth](#) [#1726]

Re-Os isotopes provide pertinent age information in the Lherz peridotite (the type locality of terrestrial mantle lherzolite), and are used to constrain the composition and evolution of bulk silicate Earth.

Luo Y. Yin Q. Z. Ayers J. C. Ryerson F. Hutcheon I.

[Experimental Measurements of Zircon/Melt Trace Element Partition Coefficients: Key Issues and Possible Solutions with Nano-SIMS](#) [#2516]

We highlight the current problems with obtaining zircon/melt trace-element partition coefficient data and point out that Nano-SIMS *in situ* analysis at the zircon/melt interface (< submicron scale) may solve the long standing problem.

Ricolleau A. Fei Y. Castro V.

[Oxygen Partitioning Between Metallic Alloy and Silicate Melts](#) [#2340]

We investigated the solubility of oxygen in metallic alloy, such as Fe, Fe-Ni, Fe-Ni-S, Fe-Ni-S-C, in the presence of silicates melts, at 2 and 8 GPa, and at 2000° and 2600°C.

Larson A. L. Colson R. O.

[Reintepretation of Observed Effects of CO on Crystallization in Silicate Melts at 1-Atmosphere Pressure](#) [#1343]

We observe an effect of CO at 1-atm pressure on crystal growth in silicate melts, concluding that at least some of the observed effect is related to an effect of CO on melt quenchability.

Gupta G. Sahijpal S.

[Planetary Differentiation of Vesta with ²⁶Al and ⁶⁰Fe as Heat Sources](#) [#1530]

Numerical simulations have been performed for the planetary differentiation of Vesta and other differentiated meteorite parent bodies with ²⁶Al and ⁶⁰Fe as heat sources.