Monday, March 12, 2007
PLANETARY DIFFERENTIATION: MANTLES AND CORES
8:30 a.m. Marina Plaza Ballroom

Chairs: **L. T. Elkins-Tanton**
W. Ertel

8:30 a.m. Elkins-Tanton L. T. * Parmentier E. M. Hess P. C.
The Effects of Magma Ocean Depth and Initial Composition on Planetary Differentiation **[#1761]**
First-order characteristics such as planetary radius and volatile content can influence differentiation in early magma oceans sufficiently to produce bodies with surface features as dissimilar as those of Mars and the Moon.

8:45 a.m. Longhi J. * Rodriguez Durand S.
Fe/Mn/Mg Constraints on the Bulk Composition of the Earth **[#2418]**
Fe/Mn/Mg relationships point to a non-chondritic composition for the upper mantle that is not readily explained by high pressure crystallization or metal silicate fractionation or volatility.

9:00 a.m. Nesheim T. * Colson R. O. Cota A. Larson A. Rock J. Johnson C.
Neutral Nickel in Silicate Melts: Characterization of Experimental Results **[#1719]**
Ni metal beads found in silicate glass subsequent to quench are consistent with formation by exsolution during quench and may indicate significant (although small) solubility of neutral nickel in silicate melts.

9:15 a.m. Melosh H. J. * Rubie D. C.
Ni Partitioning in the Terrestrial Magma Ocean: A Polybaric Numerical Model **[#1593]**
The differentiation of iron metal from molten silicate in the early earth is studied with a novel numerical technique. We find that the Ni abundance in the magma ocean is controlled by partition at high pressure and temperature.

9:30 a.m. Walker R. J. * Puchtel I. S. Brandon A. D. Horan M. F. James O. B.
Highly Siderophile Element Abundance Constraints on the Nature of the Late Accretionary Histories of Earth, Moon and Mars **[#1158]**
Absolute and relative abundances of highly siderophile elements present in terrestrial, lunar and martian materials provides evidence for late accretion. New results provide a better characterization of the late accreted materials.

9:45 a.m. Righter K. * Humayun M. Danielson L.
Partitioning of Pd Between Fe-S-C and Mantle Liquids at High Pressure and Temperature: Implications for Core Formation **[#2261]**
Experimental studies of palladium partitioning at high temperature and pressure show that its concentration in planetary mantles can be explained by metal-silicate equilibrium rather than late chondritic additions.

10:00 a.m. Jones J. H. * Malavergne V. Neal C. R.
Crystal Field Effects and Siderophile Element Partitioning: Implications for Mars HSE Geochemistry **[#1170]**
In which the authors attempt to explain their inability to make Pt enter the olivine structure.

10:15 a.m. Ertel W. * Dingwell D. B.
Experimentally Determined Solubilities of the HSE Re, Os, Pt, and Rh Applying the Mechanically Assisted Equilibration Technology **[#2046]**
We present experimental results on the metal/silicate partitioning behaviour of Re, Os, Pt and Rh applying the mechanically assisted equilibration technique. Results indicate addition of a late chondritic veneer after core formation had seized.

10:30 a.m. Holzheid A. * Kegler Ph. Frost D. Rubie D. C. Palme H.
Partitioning Behaviour of Copper and Germanium: Implications for Terrestrial Core Formation Scenarios **[#2090]**
To better understand possible metal-silicate equilibration within a terrestrial magma ocean we have experimentally determined the metal-silicate partitioning of Ge and Cu at elevated pressure.

10:45 a.m. Agee C. B. * Martin E.
Molybdenum Solubility in Silicate Melt at High Pressures and Temperatures: Experimental Constraints on Planetary Core Formation **[#2170]**
We present data from more than 60 experiments on molybdenum solubility in a wide range of silicate melt compositions at high P and T. The purpose of this study is to determine if there are conditions during core formation that can explain the Mo abundance in the Earth's upper mantle.

11:00 a.m. Chabot N. L. * Corrigan C. M. McDonough W. F. Watson H. C. Saslow S. A. McCoy T. J.
Crystal Structure Influence of Fe Alloys on Element Partitioning **[#1280]**
As a core solidifies, how elements partition between the liquid and solid core will be influenced by the crystal structure of the solid Fe alloy. This work experimentally examines that effect, applying the results to meteorites and Earth's core.

11:15 a.m. Fei Y. * Wang Y. Deng L.
Melting Relations in the Fe-C-S System at High Pressure: Implications for the Chemistry of the Cores of the Terrestrial Planets **[#1231]**
We report new experimental results on the melting relations in the Fe-C and Fe-C-S systems up to 25 GPa. In particular, we examine the solubility of carbon in metallic iron and the effect of pressure on the eutectic temperature and composition.

11:30 a.m. Poitrasson F. * Roskosz M.
Metal-Silicate Iron Isotope Partitioning Experiments at HP and HT **[#1319]**
Metal-silicate partitioning experiments performed at HP and HT show no Fe isotope fractionation. This confirms theoretical prediction and suggests that mantle-core differentiation did not affect Fe isotopes if this process occurred at equilibrium.