

Monday, March 19, 2018

[M102]

**PLANETARY VOLATILES: IT'S NOT ALL ABOUT THE WATER****8:30 a.m. Waterway Ballroom 4**

**Chairs:** **Kun Wang**  
**Katharine Robinson**

- 8:30 a.m. Sharp Z. D. \* Olson P. L.  
[\*Atmospheric Ingassing and Outgassing During Terrestrial Planet Accretion: Implications for Water, Helium-3, and Mantle Oxidation\*](#) [#1365]  
Ingassing of primordial He and H from the solar nebula is modeled. Three ocean equivalents H and 3x present-day He are ingassed. Raising  $f(\text{O}_2)$  provides HSE source.
- 8:45 a.m. Treiman A. H. \* LaManna J. M. Anovitz L. M. Hussey D. S. Jacobson D. L.  
[\*Neutron Computed Tomography of Meteorites: Detecting Hydrogen-Bearing Materials\*](#) [#1993]  
What slips through lead bricks / Is stopped by budding flowers / Sees water in stones?
- 9:00 a.m. Peslier A. H. \* Hervig R. Yang S. Barnes J. J. Humayun M. et al.  
[\*Water Content and  \$\delta D\$  of the Martian Mantle from FTIR and SIMS Analyses of Nakhilites\*](#) [#1246]  
The water content and D/H ratio of the martian mantle are derived from analyses of nakhilites.
- 9:15 a.m. Barnes J. J. \* Thompson M. S. McCubbin F. M. Howe J. Y. Rahman Z. et al.  
[\*Coordinated Microanalysis of Phosphates in Apollo 11 High-Titanium Basalts\*](#) [#2667]  
We performed coordinated microanalysis of two phosphates from high-Ti basalts from Apollo 11.
- 9:30 a.m. Lin Y. \* van Westrenen W.  
[\*Isotopic Evidence for Volatile Replenishment of the Moon During Late Accretion\*](#) [#1207]  
The Moon's initial volatiles were replenished ~0.5 Ga after their formation, with their final budgets reflecting a mixture of sources and delivery times.
- 9:45 a.m. Pernet-Fisher J. F. \* Joy K. H.  
[\*Noble-Gas Isotope Systematics of Lunar Anorthosites: Hunting for Indigenous Signatures\*](#) [#1951]  
Xe isotopes are reported for lunar anorthosites. Depletions in  $^{134}\text{Xe}$  and  $^{136}\text{Xe}$  are observed, offering tantalizing insights into indigenous lunar noble-gases.
- 10:00 a.m. Seegers A. X. \* Steenstra E. S. van der Waal A. W. Matveev S. Berndt J. et al.  
[\*The Effect of Water on the Metal-Silicate Partitioning Behavior of Volatile Siderophile Elements During Lunar Core Formation\*](#) [#1582]  
Limited effect of H on metal-silicate partitioning of volatile siderophile elements suggest no change in siderophile behavior during lunar core formation.
- 10:15 a.m. Burney D. \* Neal C. R. Taylor G. J.  
[\*Moderately Volatile Elements \(MVEs\) in Lunar Basalts; An Investigation into the Evolution of the Mare Source Regions\*](#) [#1274]  
Analyses of moderately volatile elements in whole rock lunar basalts via ICP-MS indicate a degassing event that affected the high-Ti mare source region.
- 10:30 a.m. Wimpenny J. B. \* Borg L. E. Sanborn M. E. Yin Q.-Z.  
[\*Investigating the Zn Isotopic Composition of Mare Basalts; Implications for Zn Systematics on the Moon\*](#) [#2593]  
Zn isotope ratios in mare basalts correlate with [Zn]. This is suggestive of two-component mixing between sources with heterogeneous Zn systematics.

- 10:45 a.m. Kleine T. \* Matthes M. Nimmo F. Leya I.  
[Silver Isotopic Evidence for Impact-Driven Volatile Loss from Differentiated Asteroids](#) [#1963]  
The extreme volatile depletion of group IVB irons reflects degassing from a molten metallic body, which was exposed by early (~10 Ma) catastrophic disruption.
- 11:00 a.m. Saxena P. \* Killen R. M. Airapetian V. Petro N. E. Mandell A. M.  
[Post-Formation Sodium Loss on the Moon: A Bulk Estimate](#) [#1813]  
Some observed depletion of sodium in lunar samples may be due to post-formation processes such as solar activity, loss from a primordial atmosphere and impacts.
- 11:15 a.m. Jiang Y. \* Chen H. Fegley B. Jr. Lodders K. Hsu W. et al.  
[New High-Precision Potassium Isotopes of Tektites](#) [#1311]  
We report new K isotope data of various tektites, and compare tektites and lunar samples using moderately volatile element isotopes including K, Cu, and Zn.
- 11:30 a.m. Dauphas N. \* Meheut M. Blanchard M. Zeng H. Galli G. et al.  
[Can Lunar Formation Theories Be Tested with K Isotopes?](#) [#2481]  
Fundamentally, there is nothing that distinguishes high-energy impact models from the canonical model with regard to K isotopic fractionation.