Monday, March 15, 2004

SPECIAL SESSION

OXYGEN IN THE SOLAR SYSTEM I

8:30 a.m. Marina Plaza Ballroom

Chairs: J. J. Papike
R. C. Wiens

8:30 a.m. Papike J. J. * Mackwell S.
Oxygen in the Solar System: Origins of Isotopic and Redox Complexity [#1021]

8:45 a.m. Clayton R. N. *
The Origin of Oxygen Isotope Variations in the Early Solar System [#1682]
The primary cause of oxygen isotope heterogeneity among chondrules and CAI is photochemical self-shielding. Isotopic variations among parent bodies are not yet understood.

9:15 a.m. Wiens R. C. * Burnett D. S. McKeegan K. D. Thiemens M. H. Franchi I. A.
Bochsler P. Mao P.
Solar and Solar-Wind Oxygen Isotopes and the Genesis Mission [#1296]
The solar oxygen isotope composition is thought to hold important clues to pre-planetary processing of materials in the solar nebula, yet it is essentially unmeasured. Here we describe plans for O isotope analyses of Genesis solar-wind samples.

9:30 a.m. Clayton D. D. *
Solar $^{18}$O/$^{17}$O and the Setting for Solar Birth [#1045]
The burst of star formation during the gaseous merger of the Milky Way with a low-metallicity dwarf galaxy created not only the Si-isotope correlation in mainstream SiC grains but also the anomalously large $^{18}$O/$^{17}$O ratio in the sun.

9:45 a.m. Jones R. H. * Leshin L. A. Guan Y.
Oxygen Isotopes in Early Solar System Materials: A Perspective Based on Microbeam Analyses of Chondrules from CV Carbonaceous Chondrites [#1865]
We have measured oxygen isotope ratios in olivine grains from chondrules in the Allende and Mokoia CV chondrites, using SIMS. We show how microbeam data can be used to address fundamental questions about the early solar system.

10:00 a.m. Brownlee D. E. * Messenger S.
Insight into Primordial Solar System Oxygen Reservoirs from Returned Cometary Samples [#1994]
Analysis of bona fide cometary samples will be essential for answering some fundamental outstanding questions in cosmochemistry, such as (1) the proportion of interstellar and processed materials that comprise comets and (2) whether the Solar System had a $^{16}$O-rich reservoir.

10:15 a.m. BREAK

10:30 a.m. Binzel R. P. *
Tracing Meteorites to Their Sources Through Asteroid Spectroscopy [#1735]
A goal of asteroid spectroscopy is to forge links to meteorite classes. An increasing number of asteroid and meteorite types appear traceable to specific locations, pinpointing oxidizing conditions in the solar nebula.

10:45 a.m. Jones J. H. *
Redox Conditions Among the Terrestrial Planets [#1264]
A brief tour of redox conditions within the inner solar system.
11:00 a.m. Herd C. D. K. *

*Redox Complexity in Martian Meteorites: Implications for Oxygen in the Terrestrial Planets [#2008]*

The talk will summarize recent redox studies of shergottite meteorites and their implications for martian basalt petrogenesis and planetary controls on oxygen fugacity. It can be thought of as a case study in Oxygen in the Terrestrial Planets.

11:15 a.m. Farquhar J. * Johnston D. T. Calvin C. Condie K.

*Implications of Sulfur Isotopes for the Evolution of Atmospheric Oxygen [#1920]*

We present new $^{36}\text{S}$ vs $^{33}\text{S}$ data that reproduces our earlier data from UCSD and supports the interpretation of large nonzero $^{33}\text{S}$ in samples older than 2.45 Ga and not in younger samples has been interpreted to reflect the rise of atmospheric oxygen.

11:30 a.m. Lunine J. I. Kargel J. S. * Calvin W. Gautier D. Moses J. Owen T. C.

*Oxygen in the Outer Solar System [#1924]*

The Outer Planets Team of the LPI Solar System Oxygen Initiative will survey the occurrence, isotopic composition, history, and chemical processes in the formation, evolution, and current state of the outer Solar System.

11:45 p.m. McKinnon W. B. *

*On the Oxidation States of the Galilean Satellites: Implications for Internal Structures, Ocean Chemistry, and Magnetic Fields [#2137]*

With water available in excess, the Galilean satellites are potentially among the most oxidized bodies in the solar system, with numerous consequences for their evolution and present states.