

Monday, March 12, 2007
A, B, Cs OF CAIs
8:30 a.m. Crystal Ballroom B

Chairs: J. M. Paque
L. Grossman

- 8:30 a.m. Shahar A. * Young E. D.
Silicon Isotope Ratio Analysis of a CAI by Laser Ablation MC-ICPMS and Implications for the Astrophysics of CAI Formation [#1445]
Silicon isotope ratios obtained *in situ* by laser ablation MC-ICPMS, together with existing Mg isotope ratios in CAI Leoville 144A, reveal a detailed picture of the astrophysical setting of CAI melting and subsequent heating.
- 8:45 a.m. Weisberg M. K. * Kita N. T. Ushikubo T. Connolly H. C. Jr. Ebel D. S.
Spicuzza M. J. Valley J. W.
Petrologic-Isotopic Study of Amoeboid Olivine Aggregates in CR Chondrites [#1588]
We report O and Mg isotopic compositions of minerals in CR AOAs. Minerals in AOAs are ¹⁶O-rich. Refractory minerals in CR AOAs have ²⁶Mg excesses and initial ²⁶Al values as high as CAIs. They have initial ²⁶Al/²⁷Al ratios comparable to canonical values and formed contemporaneously with CAIs.
- 9:00 a.m. Paque J. M. * Toppani A. Burnett D. S. Teslich N. Moberlychan W. Dai Z. R. Bradley J. P.
TEM/SEM Evidence for Residual Melt Inclusions in Type B1 CAIs [#1755]
Complicated mineralogy is present at the spinel/melilite interface in Type B1 CAIs from Leoville and Allende. Leoville spinels have glass at the interface with melilite. Boundary clinopyroxene and glass may be a residue of the primary melting event.
- 9:15 a.m. Mendybaev R. A. * Davis A. M. Richer F. M. Ebel D. S.
Melilite from Synthetic and Natural Type B CAIs: Similarities and Differences [#2329]
We compare melilite from natural Type B CAIs and laboratory experiments. Laboratory experiments reproduce the major textural details as well as composition and zoning patterns of melilite from natural CAIs.
- 9:30 a.m. Richter F. M. * Kita N. T. Mendybaev R. A. Davis A. M. Valley J. W.
High-Precision Mg Isotopic Composition of Type B1 and B2 CAI Melilite [#2303]
The Mg isotopic composition as a function of the åkermanite composition has been measured with high precision with a Cameca IMS-1280 in two Type B CAIs. Matrix effects in the measurements were carefully documented and corrected based on measurements made on synthetic samples.
- 9:45 a.m. Teng F.-Z. * Wadhwa M. Janney P. E. Grossman L. Simon S. Dauphas N.
Magnesium Isotopic Systematics of Chondrules and CAIs from Allende, Murchison, Murray and Bjurböle [#1837]
We report here the results of high-precision Mg isotope analyses of chondrules and CAIs from Allende, Murchison, Murray and Bjurböle. Implications are presented for the initial ²⁷Al/²⁶Al and processes responsible for Mg mass-dependent fractionation in chondrules in these meteorites.
- 10:00 a.m. Simon S. B. * Sutton S. R. Grossman L.
The Valence of Titanium in Refractory Forsterite [#1892]
Models of melts in equilibrium with refractory forsterite (RF) suggest that RF contains trivalent Ti (Pack et al., 2005), with major implications for the origin of RF. We tested this prediction, measuring Ti valence by XANES in RF from Tagish Lake.

- 10:15 a.m. Grossman L. * Simon S. B. Rai V. K. Thiemens M. H. Hutcheon I. D. Williams R. W. Galy A. Ding T. Clayton R. N. Mayeda T. K.
Primordial Compositions of Refractory Inclusions [#2172]
Combining new bulk chemical and Si isotopic data with previous data on 14 CAIs, we inferred evaporative losses of Mg and Si from their bulk isotopic compositions, and calculated their original bulk chemical compositions.
- 10:30 a.m. Krot A. N. * Chaussidon M. Yurimoto H. Sakamoto N. Nagashima K. Hutcheon I. D. Hua X.
Oxygen Isotopic Compositions of the Allende Type C CAIs: Evidence for Isotopic Exchange During Nebular Melting and Asteroidal Thermal Metamorphism [#1918]
Anorthite and diopside in the Allende Type Cs experienced chondrule melting are ^{16}O -depleted compared to those in Type Cs which escaped it. Melilite is ^{16}O -poor and experienced isotopic exchange during melting and fluid-assisted thermal metamorphism.
- 10:45 a.m. Nagashima K. * Krot A. N. Huss G. R. Hua X.
Common Presence of ^{16}O -rich Melilite in Calcium-Aluminum-rich Inclusions from the Least Metamorphosed CV Carbonaceous Chondrite Kaba [#2059]
In contrast to commonly ^{16}O -depleted melilite in CAIs from Allende (CV>3.6), most melilite grains in Kaba (CV3.1) CAIs are ^{16}O -rich, suggesting a correlation between ^{16}O -depletion in melilite of the CV CAIs and petrologic type of a host meteorite.
- 11:00 a.m. Ito M. * Messenger S.
Isotopic Measurements in CAIs with the NanoSIMS: Implications to the Understanding of the Formation Process of Ca, Al-rich Inclusions [#1794]
We report the results of O isotopic measurements of CAI minerals utilizing the JSC NanoSIMS 50L. The O isotopic compositions in the minerals by spot analysis and a two-dimensional isotopic map are in good agreement with the previous measurements.
- 11:15 a.m. Fagan T. J. * Krot A. N. Kobayashi S. Yurimoto H.
Correlation Between Texture and Oxygen Isotopic Systematics in CAIs from Acfer 094 [#1252]
Acfer 094 CAIs are generally ^{16}O -rich. However, SIMS analysis and SCAPS imaging of one CAI with a diopside rim indicate that the rim formed in a ^{16}O -poor setting, implying stages of petrogenesis in distinct isotopic environments in the solar nebula.
- 11:30 a.m. Liu M.-C. * McKeegan K. D. Davis A. M. Ireland T. R.
Magnesium-26 Deficits in CM Hibonite Grains: Nucleosynthetic, Galactic Chemical Evolution, or Spallogenic? [#2253]
Apparent $\Delta^{26}\text{Mg}^*$ deficits have been confirmed by recent ion microprobe analyses on CM hibonite grains. In this abstract, we explore several processes that could possibly be responsible for the observed $\Delta^{26}\text{Mg}^*$ deficits.