Thursday, July 11, 2019
REFRACTORY INCLUSIONS
9:00 a.m. Conference Room 1
Chairs: Mutsumi Komatsu and Samuel Ebert
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Times	Authors (*Denotes Presenter)	Abstract Title and Summary
9:00 a.m.	Manga V. R. * Zega T. J. Muralidharan K.	*Thermodynamic Modeling of Pyroxene Solid Solutions: Revisiting the Condensation Sequence of Refractory Minerals in Calcium- and Aluminium-Rich Inclusions* **[#6226]** We report the condensation calculations of Al-Ti-rich pyroxene solid-solutions and present the revised condensation sequence of various refractory mineral phases that are observed within the calcium- and aluminium-rich inclusions (CAIs).
9:15 a.m.	Han J. * Park C. Keller L. P.	*Microstructural Record of Evolving Condensation Processes in Fine-Grained Ca-Al-Rich Inclusions from the Reduced CV3 Chondrites* **[#6435]** We discuss the evolving sequence of high-temperature condensation and gas-solid reactions that grew single grains into layered nodules based on FIB/TEM analyses of FGIs from the reduced CV3 chondrites.
9:30 a.m.	Komatsu M. * Fagan T. J. Krot A. N. Nagashima K. Petaev M. I. Kimura M. Yamaguchi A.	*Ultra-Refractory CAI in a Low-Ca Pyroxene- and Silica-Bearing Amoeboid Olivine Aggregate in a CR Chondrite: Formation by Gas-Solid Condensation over a Wide Temperature Range* **[#6167]** AOAs have avoided significant melting after the aggregation, retaining records of nebular gas-solid interactions. Here we describe an AOA from the CR chondrite Y-793261 providing an evidence for gas-solid condensation over a wide temperature range.
9:45 a.m.	Fukuda K. * Kita N. T. Tenner T. J. Kimura M.	*Mg Isotope Ratios and Minor Element Abundances of AOAs: Insights into Their Origins* **[#6206]** Relationships between chemical, textural, and isotopic signatures of AOAs were investigated. Compact and porous AOAs experienced different nebular histories.
10:00 a.m.	Liu M.-C. * Han J. Brearley A. J. Hertwig A. T.	*Aluminum-26 Chronology of Dust Coagulation and Early Solar System Evolution* **[#6182]** Early solids grew fast / But how fast? / Small inclusions tell you.
10:15 a.m.	Kawasaki N. * Park C. Sakamoto N. Yurimoto H.	*Variations in Initial ^{26}Al Abundances among Fine-Grained Ca-Al-Rich Inclusions in the Reduced CV Chondrites* **[#6021]** We obtained Al–Mg mineral isochrons of five fine-grained Ca-Al-rich inclusions from the reduced CV chondrites. Inferred initial $^{26}Al/^{27}Al$ range from (5.19 ± 0.17) to (3.35 ± 0.21) × 10^{-5}, corresponds to a formation age spread of 0.44 ± 0.07 Myr.
10:30 a.m.	Wada S. * Kawasaki N. Yurimoto H.	*Oxygen and Al-Mg Isotope Systematics of a Hibonite-Melilite-Rich Fine-Grained CAI in the Reduced CV Chondrite Northwest Africa 8613* **[#6028]** Oxygen and Al-Mg isotope systematics correlated with crystal growth sequences for a fine-grained CAI imply the presence of the solar nebular gas with variable oxygen isotope compositions 0.16 ± 0.02 Myr after the formation of canonical CAIs.
10:45 a.m.	Sakamoto N. * Kawasaki N.	*Extreme ^{16}O-Rich Refractory Inclusions in the Isheyevo Chondrite* **[#6069]** Four refractory inclusions consist of grossite rimmed by spinel, melilite (+diopside) have extreme ^{16}O-rich compositions in the Isheyevo chondrite located on the extension of cosmic symplectites passing through chondrules.
11:00 a.m.	Park C. * Sakamoto N. Wakaki S. Kobayashi S. Kawasaki N. Yurimoto H.	*Constraints on the Cooling Rate from ^{16}O-Rich Perovskite in a Compact Type A CAI from Allende* **[#6163]** We report ^{16}O-enriched perovskite enclosed by ^{16}O-depleted melilite in a compact Type A CAI from Allende. O-isotopic compositions of both minerals are likely primary and the estimated cooling rate for the CAI is 1000–5000 K/hr.

11:15 a.m.	Krot A. N. * Ma C. Nagashima K. Davis A. M. Beckett J. R. Simon S. B. Komatsu M. Fagan T. J. Genzel P. T. Brenker F. Ivanova M. A. Bischoff A.	*Mineralogy, Petrography, and Oxygen Isotopic Compositions of Ultrarefractory Inclusions from Carbonaceous Chondrites* **[#6109]** We report on the mineralogy, petrography and in situ measured O-isotope compositions of 25 CAIs, presumably UR (rare earth elements have not yet measured in most of them), from CR2, CM2, C3.0, CO3.0–3.6, CV3.1–3.6, and CH3.0 carbonaceous chondrites.
11:30 a.m.	Yamamoto D. * Tachibana S. Kawasaki N. Kamibayashi M. Yurimoto H.	*Oxygen Isotope Exchange Between CAI Melt and Water Vapor: An Experimental Study* **[#6095]** Oxygen isotope exchange experiments between CAI melt and water vapor show that type B CAIs would be heated for at least a dozen days above the liquidus temperature of melilite.
11:45 a.m.	Park S. Y. * Park C. Kim H. N. Lee S. Y. Lee S. K.	*Probing the Oxygen Environments in Melilite Melts Using ^{17}O NMR: Implication for Variable Oxygen Isotopic Compositions of Melilite in Type A CAIs* **[#6119]** We report experimental results on the effects of composition on the structure of melilite glasses and melts [åkermanite and gehlenite join] with varying åkermanite content using high-resolution solid-state nuclear magnetic resonance.
12:00 p.m.	Mendybaev R. A. * Savage P. S. Kamibayashi M. Georg R. B. Tachibana S.	*Silicon Isotopic Fractionation During Evaporation of CAI-like Melts in Low-Pressure Conditions* **[#6212]** Si isotopes were measured in residues from low-P H_2 and vacuum evaporation experiments. The experiments show that despite evaporation in low-P H_2 is faster than in a vacuum, the chemical and isotopic fractionation of Mg and Si remains the same.
12:15 p.m.	Kamibayashi M. * Yamamoto D. Tachibana S. Yurimoto H.	*Crystallization of Type B CAI Melt in Low-Pressure Hydrogen Gas and Implications for Formation Conditions of Igneous CAIs* **[#6254]** Crystallization experiments of CAI-like melt in low pressure H_2 gas showed that melilite crystallizes from the melt rim at H_2 pressure of 10 Pa due to promoted evaporation of Mg and Si from the surface, suggesting the type B1 CAI formation at >10 Pa.
12:30 p.m.	Dunham E. T. * Liu M.-C. Hertwig A. T. Desch S. J. Wadhwa M.	*CO3 and CH/CB CAIs suggest ^{10}Be was Distributed Uniformly in the Solar Nebula* **[#6346]** We find that the short-lived radionuclide ^{10}Be was distributed uniformly in the solar nebula by measuring ^{10}Be-^{10}B isotope systematics in 11 CO3 and CH/CB CAIs; this indicates that ^{10}Be was likely produced in the molecular cloud by GCR irradiation.
12:45 p.m.	Torrano Z. A. * Rai V. K. Wadhwa M.	*Chromium Isotope Compositions of Refractory Inclusions: Implications for Isotopic Variability in the Early Solar System* **[#6104]** We report high-precision, mass-independent Cr isotope compositions for several CAIs and discuss the implications for isotopic variability in the CAI-forming region in the early solar system.