Abstract
The petrography and major element bulk chemistry of 29 large igneous inclusions from a diverse array of host O chondrites has been examined. These data indicate that (I) none of the inclusions in this study were derived from an igneous-differentiation source; (II) the inclusions can be subdivided into three chemical groups: unfractiected, vapor fractionated, and feldspar enriched; (III) some subgroups of inclusions likely crystallized as free-floating droplets in a space environment, and these were often vapor fractionated; and (IV) some inclusions that probably derive from shock-melted material have a pronounced K enrichment.

Methods and Samples
Polished thin sections of 29 inclusions have been examined with optical microscopy (OM) and scanning electron microscopy (SEM). False-color phase maps were collected to determine modal abundance (via pixel counting, see below), and phase compositions were determined with a silicon-drift energy dispersive X-ray (EDX) detector integrated with an Oxford Instruments AZtec X-ray analytical system. Bulk chemistry was then calculated via modal reconstruction.

Results and Discussion
Chemical Groups

Future Work
The work presented here is a subset of a larger project that aims to better understand the origins of these inclusions. Additional samples will be examined with SIMS, certain samples will be analyzed for O isotopes, and some samples will be dated with either I-Xe or Hf-W methods.

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References
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Shock Melt
Several of the inclusions in this study are probably shock melts. 869-I1, shown here, appears to have melted into droplets and possibly melted the host. Two inclusions, including 869-I1, have essentially chondritic bulk chemistries but are enriched in K, in some cases to a striking degree (see left). Analyses of other samples known to be shock-melt have also shown an excess of K, suggesting that Xenolith may be an indicator of shock.

Drop-formed Inclusions
Eight inclusions are round in shape, have textures commonly seen in chondrules, concentric textures, radial variations in texture and/or chemistry, have distinct rims, and appear to have interacted with their surroundings. They probably, like chondrules, crystallized as free-floating droplets in space. Interestingly, all of these inclusions may have been affected by a volatility fractionation process (left).