**ELEMENT HOSTS IN ANHYDROUS IDPS: A TEST OF NEBULA CONDENSATION MODELS.**

G. J. Flynn,[1] L. P. Keller[2] and S. R. Sutton[3]. [1]Dept. of Physics, SUNY-Plattsburgh, Plattsburgh NY 12901, USA. george.flynn@plattsburgh.edu. [2]NASA Johnson Space Center, Houston, TX 77058. [3]Dept of Geophysical Sciences and CARS, The University of Chicago, Chicago, IL 60637.

**Introduction:** Many anhydrous interplanetary dust particles (IDPs) are the most pristine samples of primitive Solar System dust that are currently available for laboratory analysis. Because these primitive, anhydrous IDPs show little or no evidence that they have experienced either thermal or aqueous alteration since their formation, they preserve materials that formed in the early Solar Nebula as well as presolar materials. Thus, we can test the applicability of equilibrium nebula condensation models to our Solar System by comparing the host mineral of each element with the host that is predicted by the nebula condensation models.

**Samples:** We have mapped the spatial distribution of most of the elements from K to Zn in ultramicrotome sections, each ~100 nm thick, in 3 primitive, anhydrous IDPs – L2011*B2, L2010B10, and L2009*F3, all of which are fragments of cluster IDPs. We employed a zone plate focused X-Ray Microprobe (XRM) at Sector 2 of the Advanced Photon Source (APS) at the Argonne National Laboratory to perform the element mapping. This XRM has ~150 nm spatial resolution, which is sufficient to resolve individual mineral grains in most of the anhydrous IDPs.

**Results:** Each element that we mapped was found to be localized within each IDP, with some element hot-spots being submicron is size.

*K Results.* L2011*B2 is a cluster fragment that contains a relatively high K concentration. The K is spatially correlated with the silicate in this particle. Nebula condensation models indicate that K should condense at ~1000 K into K-feldspar [1, 2]. However, Transmission Electron Microscope (TEM) examination of other ultramicrotome sections of this fragment indicate that the silicate in L2011*B2 is pyroxene, rather than feldspar.

*S Results,* Small S hot-spots were detected in each IDP. Most of the S is concentrated in Fe-sulfides, consistent with the prediction of nebula condensation models that S should condense at ~650 K into Fe-sulfide [1, 2].

*Zn Results,* The Zn is concentrated into small hot spots, which are collocated with S. This is consistent with the prediction of nebula condensation models that Zn should condense at ~660 K into Zn-sulfide [1, 2].

*Cu Results:* The Cu is concentrated into small hot spots, which are collocated with S. The equilibrium nebula condensation models predict that Cu should initially condense at ~1040 K into a metal alloy [1, 2].

*Ca, Ti, Cr, Mn, and Ni Results,* We also observed hot-spots of Ca, Ti, Cr, Mn, and Ni in the element maps. The host minerals of each of these elements will be determined by TEM, and compared to the predictions of the equilibrium nebula condensation models.

**References:** [1] Grossman, L. 1972, *Geochimica et Cosmochimica Acta*, **36**, 597-619. [2] Grossman, L. and Larimer, J. W. 1974, *Reviews of Geophysics and Space Physics*, **12**, 71-101.