**FORMATION OF REFRACTORY METAL ALLOYS: THE FIRST CONDENSATES OF THE SOLAR SYSTEM?**

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Sub-micrometer sized refractory metal nuggets (RMN) separated from acid resistant residues of the Murchison meteorite have concentrations of the refractory metals Os, W, Ru, Mo, Ir that match calculated high temperature condensates having equilibrated with a solar composition gas at 1400 to 1600 K at $10^{-4}$ bar. The presence of the proper amounts of the easily oxidizable elements Mo and W in the alloy makes alteration in the meteoritic environment or during chemical processing very unlikely and thus supports a condensation origin [1]. A TEM study of a subset of these grains indicates a hexagonal close-packed crystal structure in all cases, supporting single phase condensation [2].

The most important objective in further studies is the in situ identification of the RMN: In polished sections of Allende and Murchison we have begun a systematic search for submicron refractory metal particles in order to see if the morphology and chemistry of these particles is identical to the particles recovered from acid resistant residues.

First results indicate that the RMN are very rare and are probably restricted to certain areas of the meteorites. It is presently unclear if the RMN are associated with CAI or occur as isolated grains in matrix, or both.

At the same time we have produced additional acid residues from Murchison. In one of these residues another population of RMN was identified. By the time of the conference we will present the compositions of these RMN. It is of interest to see if this new population of RMN covers exactly the same range in condensation temperatures as the particles of the population described by [1]. Furthermore we have started to produce acid residues from Allende to see if there are particles which could be similar or identical to those from Murchison.

**References:** [1] Berg T. et al. 2009. *ApJ*, 702, L172–L176. [2] Harries D. et al. 2011. Abstract#1837. 42nd Lunar and Planetary Science Conference.