NOBLE GAS COMPOSITION IN MAGNETIC AND NON-MAGNETIC SEPARATES FROM ALLENDE CHONDRULES.

J. P. Das, A. Meshik, O. Pravdivtseva and C. M. Hohenberg. Department of Physics, Campus Box 1105, Washington University, 1 Brookings Drive, Saint Louis, MO 63130, USA. E-mail: jdas@physics.wustl.edu

Introduction: All chondrites except CIs, contain abundant chondrules within a finer-grained matrix. Although, chondrules were formed by high temperature flash heating events and rapid cooling, the diversity of chondrule properties suggest that chondrules carry memory of their precursors (e.g. [1]). To look for noble gases components which might have survived chondrule formation He, Ne, Ar, Kr and Xe compositions were measured in magnetic (*M*) and non-magnetic (*NM*) separates from chondrules of Allende meteorite.

Some Results: Samples were wrapped in platinum foil, remotely dropped into an open tungsten coil and heated by stepped pyrolysis in three steps: 300°C, 1000°C and melting. The noble gases released at 300°C were similar to the system blank (atmospheric composition) and only those released in the 1000°C and melting steps were used in this analysis. ^{84}Kr and ^{132}Xe in non-magnetic (*NM*) fraction of chondrules is depleted by factor of two and three respectively compared to that of the magnetic (*M*) fraction, but the Xe is more radiogenic: $(^{129}Xe/^{132}Xe)_{NM}$ ~ 36, whereas $(^{129}Xe/^{132}Xe)_{M}$ ~ 6]. This indicates more trapped Xe in the *M* fraction, but more radiogenic Xe in the NM fraction. Trapped ^{36}Ar is similar (~ 3×10^{-8} cm^{3}STP/g) in both *NM* and *M* fractions.

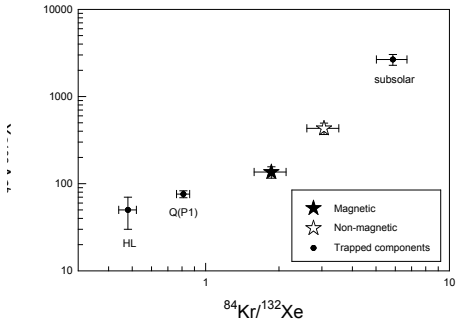

Fig. 1. Elemental abundance ratios in magnetic and non-magnetic separates from Allende chondrules and the major trapped components.

Discussion: Differing compositions of trapped heavy noble gases in *M* and *NM* fractions indicate that the different components in these chondrules are carried by different host minerals. As shown in figure, the *M* fraction, with its greater trapped content is closer to the Q component. The higher trapped ^{84}Kr and ^{132}Xe in the *M* fraction, enriched in metal, can be explained by fractionation between metal and silicate during chondrule formation as suggested by [2, 3]. Further delineation between these, along with other noble gases results, will be presented.

References: [1] Niemeyer S. et al. 1988. *Geochim. Cosmochim. Acta* 52:309-318. [2] Vogel N. et al. 2004. *Meteoritics & Planetary Science* 39:117-135. [3] Das J. P. and Murty S. V. S. 2009. *Meteoritics & Planetary Science* 44:1797-1818.

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