

+
#0057

+

**Pre-irradiation of chondrules
in the Early Solar System.**

U. Beyersdorf-Kuis*, M. Tieloff, J. A. Cartwright, J. W. Bennett, U. Ott, *MPIC, Hahn-Meitner-Weg 1, 55128 Mainz, uta.beyersdorf@mpic.de.

Pre-irradiation of chondrules by cosmic rays is indicated by an excess of cosmogenic noble gases relative to the matrix, for which previous studies have reported occasional evidence [1-6]. Here, we present data for primitive CR and CV chondrites (including CR3s MET 00426 and QUE 99177), and ungrouped Acfer 094. Target element abundances were determined by INAA on the same material used for noble gas measurements (He, Ne, Ar).

“Nominal” cosmic ray exposure ages (without shielding correction, i.e. $(^{22}\text{Ne}/^{21}\text{Ne})_c = 1.11$) of most CR chondrite chondrules are enhanced compared to the matrix (up to 27 Ma in case of NWA 852), strongly pointing towards a pre-irradiation. Solar wind (SW) gases in NWA 852 and El Djouf 001 may indicate a pre-irradiation on the parent body, whereas pre-irradiation in the solar nebula cannot be excluded, especially for QUE 99177. An important new finding is that parts of the matrix appear have been pre-irradiated.

[1] Polnau E. et al. (2001) GCA 65, 1849-1866. [2] Eugster O. et al. (2007) MAPS 42, 1351-1371. [3] Das J. and Murty S. (2009) MAPS 44, 1797-1818. [4] Matsuda S. et al. (2010) Antarctic Meteorites 33, 49-50. [5] Roth A. et al. (2011). MAPS 46, 989-1006. [6] Huber L. et al. (2012) 43rd LPSC, #1420.

+

Cite abstract as:

Beyersdorf-Kuis, U., Tieloff, M., Cartwright, J. A., Bennett, J. W., et al. (2013) Pre-irradiation of chondrules in the Early Solar System.. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2013/0057.pdf> (abstract #0057).