

+

#0062

+

Cosmic ray exposure ages of individual chondrules from Murchison (CM).

Riebe*, M., Huber, L., Wieler, R., Metzler, K., Maden, C., Meier, M.M.M., Busemann, H., *Inst. of Geochemistry and Petrology, Dep. of Earth Sciences, ETH Zurich, Switzerland, riebe@erdw.ethz.ch.

Individual chondrules of some meteorites, in particular CM chondrites, sometimes have cosmic ray exposure (CRE) ages significantly higher than the CRE age of bulk samples of the same meteorites [1,2]. These chondrules therefore have been more exposed to cosmic rays than the average bulk rock. Two main hypotheses have been put forward to explain this, (1) chondrules were exposed to cosmic rays emitted from the early active sun prior to accretion [2] and, (2) chondrules were exposed to mainly galactic cosmic rays in the parent body regolith [1,3]. In this work we test these hypotheses by determining CRE ages of Murchison chondrules from inside and outside a primary rock fragment. Chondrules inside the fragment should have a shared regolith history and, chondrules from outside the fragment are expected to have regolith histories that varies between chondrules. We find that at least for chondrules from Murchison the pre-exposure to cosmic rays most likely occurred in the parent body regolith.

[1] Roth A. S. G. et al. (2011) MAPS 46, 989-1006. [2]

Hohenberg C. M. et al. (1990) GCA 54, 2133-2140. [3]

Wieler R. et al. (2000) MAPS 35, 251-257.

+

+

Cite abstract as:

Riebe, M., Huber, L., Wieler, R., Metzler, K., et al. (2015) Cosmic ray exposure ages of individual chondrules from Murchison (CM).. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2015/0062.pdf> (abstract #0062).