

EXPOSURE HISTORIES OF CM2 CARBONACEOUS CHONDRITES – UPDATE. K. Nishiizumi¹ and M. W. Caffee². ¹Space Sciences Laboratory, University of California Berkeley, CA 94720-7450, USA. e-mail: kuni@ssl.berkeley.edu. ²Department of Physics, Purdue University, West Lafayette, IN 47907-1396, USA.

Introduction: The cosmic ray exposure (CRE) age distribution of CM2 carbonaceous chondrites is distinctly different from all other classes of meteorites, including classes of carbonaceous chondrites [e.g., 1]. Many CM2 chondrites show evidence of low-temperature aqueous alteration in the early solar system. Some of the hydrous CM2's were heated after aqueous alteration but there is no chronological record for the post hydration heating [e.g., 2].

Results and Discussion: As an extension of our previous work [1], we determined CRE ages of 103 CM2 chondrites based on measurements of cosmogenic ¹⁰Be, ²⁶Al, ³⁶Cl, and ⁴¹Ca in conjunction with noble gas data from the literature. Figure 1 shows a histogram of exposure ages (<2 Myr) of 45 CM2 chondrites, excluding possible pairs. Some significant features are already described in previous work [1]. The most remarkable features are (1) distinct clusters of collisional events 0.2 Myr and 0.6 Myr ago, and (2) a wide gap between 0.7 and 1.2 Myr containing no members. In stark contrast to other meteorites, the CM2 parent body has experienced catastrophic collisional events within last 0.7 Myr that have delivered material to Earth. Although exposure ages of only several CM2's were measured by both radionuclides and noble gases, the two methods are in good agreement for most cases. We don't find clear evidence of complex exposure history for CM2. Four meteorites (Belgica 7904, LEW 90500, Sayama, and Yamato 82042) have shorter noble gas exposure ages than those based on radionuclides, presumably indicating depletion of cosmogenic noble gases. Recent (less than a few Myr) heating event(s) might explain this depletion of noble gases.

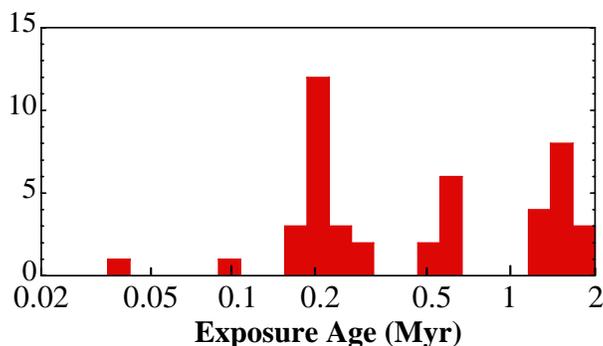


Fig.1. Histogram of exposure ages (<2 Myr) of CM2 chondrites.

Acknowledgments. This work was supported by NASA Cosmochemistry program.

References: [1] Nishiizumi K. and Caffee M. W. 2002. *Meteoritics & Planetary Science* 37: A109. [2] Nakamura T. 2005. *Journal of Mineralogical and Petrological Sciences* 100: 260-272.