

### CONCORDANT EARLY SOLAR SYSTEM TIMESCALES FROM Pb-Pb AND EXTINCT CHRONOMETERS

M. Wadhwa<sup>1</sup>, A. Bouvier<sup>1</sup>, and G. A. Brennecke<sup>1</sup>. <sup>1</sup>Arizona State University, Tempe, AZ 85287 \*wadhwa@asu.edu

In recent years, high-resolution chronometers based on long- and short-lived radionuclides have been applied extensively to towards determining the timescales, with sub-Ma precision, of events that occurred in the early Solar System (ESS). However, these chronometers have often yielded discordant ages (e.g., [1,2]). Our recent work focuses on high-precision Pb-Pb and Al-Mg systematics of several meteorites and their components (e.g., [1-4]). We also showed that  $^{238}\text{U}/^{235}\text{U}$  in meteoritic materials can be variable [5,6]. We recently presented a Pb-Pb age of  $4568.2^{+0.2}_{-0.4}$  Ma for a CAI from the NWA 2364 CV3 meteorite [3]; although its U isotopic composition was not measured, the uncertainty in its reported Pb-Pb age incorporates possible deviation of its  $^{238}\text{U}/^{235}\text{U}$  ratio from the previously assumed value (=137.88). We find that the Al-Mg ages using the NWA 2364 CAI as the anchor agree with those obtained using D'Orbigny as the anchor (Fig. 1), implying that the relatively old age for this CAI is robust and  $^{26}\text{Al}$  was uniformly distributed in the ESS. These Al-Mg ages also agree with the Mn-Cr and Pb-Pb ages (Fig. 1). One exception is Asuka 881394, the Pb-Pb age of which is ~1 Ma older than its Al-Mg and Mn-Cr ages. Its Pb-Pb age was calculated assuming that its  $^{238}\text{U}/^{235}\text{U}$  has the same value as that which we measured in other achondrites [4,7], which may not be a valid assumption. Nevertheless, Fig. 1 shows that our recent high-precision chronological investigations yield consistent timescales for ESS events such as planetesimal differentiation.

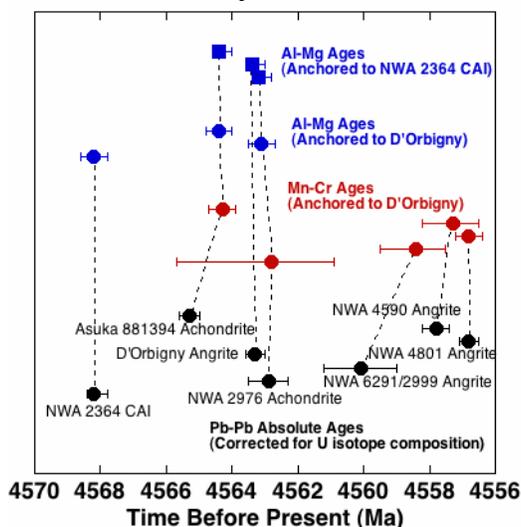


Fig. 1. Pb-Pb ages (calculated using measured  $^{238}\text{U}/^{235}\text{U}$  ratios for NWA 2976 and the angrites [4,7], and inferred values for NWA 2364 CAI and Asuka 881394) compared to Al-Mg and Mn-Cr ages. Pb-Pb and Al-Mg data from [2-7] and refs. therein; Mn-Cr data from [2,8-11].

**References:** [1] Wadhwa M. et al. (2007) *Workshop on Chronology of Meteorites and the ESS*, #4053. [2] Wadhwa et al., (2009) *GCA* 73, 5189-5201. [3] Bouvier A. and Wadhwa M. (2010) *Nature Geosci.*, 3, 637-641. [4] Bouvier A. et al. (2011) *GCA*, submitted. [5] Bouvier A. et al. (2011) *Goldschmidt Conf.*, submitted. [6] Brennecke G. et al. (2010) *Science* 327, p. 449-451. [7] Brennecke G. and Wadhwa M. (2011) *Goldschmidt Conf.*, submitted. [8] Sugiura N. and Yamaguchi A. (2007) *38<sup>th</sup> LPSC*, #1431. [9] Shukolyukov A. and Lugmair G. (2008) *39<sup>th</sup> LPSC*, #2094. [10] Shukolyukov A. et al., (2009) *40<sup>th</sup> LPSC*, #1381. [11] McKibbin S. et al. (2010) *73<sup>rd</sup> Meteoritical Soc. Meeting*, #5172.