WAS ^{26}AL HETEROGENEOUSLY DISTRIBUTED IN THE EARLY SOLAR SYSTEM? Q.-Y. Yin[1], M. E. Sanborn[1], M. Huyskens[1], and Y. Amelin[2] [1]Department of Earth and Planetary Sciences, University of California at Davis, Davis, CA 95616 USA (qyin@ucdavis.edu), [2]Research School of Earth Sciences, Australian National University, Canberra, Australia

Whether ^{26}Al was homogeneously distributed in the early Solar System or not is a subject of intense debate in cosmochemistry. If it was homogeneously distributed in the entire or in some region of the protoplanetary disk, what was the exact initial ratio of ^{26}Al/^{27}Al? If it was heterogeneously distributed, what was the degree of heterogeneity recorded in the observable disk materials? The resolution of these questions has profound implications for understanding the evolution of the early Solar System. It defines whether ^{26}Al could be used as a high-resolution chronometer of accretion from dust to planetesimals and planets, whether the isotopic signatures observed in planetary materials can be used to discern the disk structure and the timescale of disk gap opening or Jupiter formation, and whether ^{26}Al was an adequate heat source of planetesimal melting.

One approach to evaluate the homogeneity of ^{26}Al distribution is to compare multiple chronometric systems, such as ^{26}Al-^{26}Mg, ^{53}Mn-^{53}Cr, ^{182}Hf-^{182}W and ^{207}Pb-^{206}Pb, on the same materials. Recent work [1] showed consistency between ^{26}Al and ^{182}Hf clocks among CAIs, chondrules from CV and CR chondrites, and angrites, with a CAI age of 4567.3±0.3 Ma [2], which points to homogenous distribution of ^{26}Al and ^{182}Hf in the early Solar System with a canonical ^{26}Al/^{27}Al=5.2×10^{-5}. However, this apparent consistency does not hold if known Pb-Pb ages for these materials are also considered. Does this reflect open system behavior for one or more chronometric systems, or heterogeneous distribution of ^{26}Al, which has the shortest half-life among the others?

On the basis of apparent disagreement between the ^{26}Al-^{26}Mg and Pb-Pb ages of CAIs and angrites, it was suggested that the angrites and most of inner Solar System materials may have originated with a much lower ^{26}Al/^{27}Al=1.33×10^{-5} instead of the canonical ^{26}Al/^{27}Al = 5.2×10^{-5} determined for CAIs [3]. If this is true, how could the consistent chronology between ^{26}Al and ^{182}Hf [1] be explained? What are the implications for the chondrule formation timescale with a revised and lowered ^{26}Al abundance? An overview of the current state of affairs will be provided in this talk.

References: [1] Budde et al. (2017) *LPSC* A1886. [2] Connelly et al. (2012) *Science* 338, 651. [3] Schiller et al. (2015) *EPSL* 420, 45.