Evidence of presolar SiC in the Allende fine-grained CAIs

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Presence of presolar grains in meteorites was first suggested based on the observed Ne [1] and Xe [2] isotopic anomalies. Noble gas analyses of the 93%-97% pure SiC from Murchison further separated by size [3,4] paved the way for the later noble gas presolar grain studies [5]. Although in most cases noble gas analyses are done in chemically enriched residues [5], CAIs are depleted in trapped noble gases and isotopic signatures of presolar grains could be potentially detected in pristine CAIs. Xenon in some fine-grained Allende CAIs analyzed in the course of I-Xe studies [6,7,8], suggested the presence of the *s*-process Xe characteristic of presolar SiC and thus called for further work.

Our step-wise analyses of *Curious Marie* (ME3364-3.2) CAI revealed the presence of *s*-process Xe and Kr in this Allende inclusion, and were supported by the Ne and Ar data [9]. We observed similar Xe *s*-process enrichments in five additional fine-grained Allende CAIs [10], supporting presence of SiC in the CAI forming region or in the place were condensate grains were agglomerated into fine-grained CAIs. Based on (Ne/Xe) ratio in SiC from ME3364-3.2, this CAI condensed in a region of the solar nebula where the fine-grained SiC were prevalent, consistent with previous observations for CV residues [5]. If so, this population of SiC acquired its noble gases at relatively low neutron density in the He shell of AGB star. (Samples from FMNH & AMNH).

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