

+

#0005

+

Beryllium-10 and CAI origin

Jacquet*, E.

*IMPMC, Muséum national d'Histoire naturelle, CP52, 57 rue Cuvier, 75005 Paris, France; emjacquet@mnhn.fr.

Calcium-aluminum-rich inclusions (CAIs) are the oldest known condensates of the Solar System, yet their astrophysical setting of formation is uncertain [1]. Evidence for now-extinct beryllium-10 indicates CAI precursors were irradiated by solar energetic particles [2-4]. As such particles would not penetrate deep in the gas, this has suggested CAI formation at the protoplanetary disk inner edge, as in the X-wind scenario [4, 5]. However, in addition to theoretical issues regarding the latter [6], the concept of CAIs as lucky xenoliths in their host chondrites is at variance with mass balance evidence [7, 8]. I have thus envisioned ^{10}Be production at the disk *surface*, followed by vertical mixing [9]. I obtain initial $^{10}\text{Be}/^9\text{Be}$ ratios for condensates comparable to observations. Thus, CAIs may have formed inside the disk, over its innermost AU.

[1] Wood J. A. (2004), GCA 68, 4007 [2] McKeegan K. D. et al. (2000), Science, 289, 1334. [3] Gounelle M. et al. (2006), ApJ, 640, 1163. [4] Sossi P. A. et al. (2017), Nature Astronomy, 1, 0055. [5] Shu F. H. et al. (2001), ApJ, 548, 1029. [6] Desch S. J. et al. (2010), ApJ, 725, 692. [7] Jacquet E. et al. (2012), Icarus, 220, 162. [8] Nanne J. A. M. et al. (2019), EPSL, 511, 44. [9] Jacquet E. (2019), A&A, 624, A131.

+

+

Cite abstract as:

Jacquet, E. (2019) Beryllium-10 and CAI origin. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2019/0005.pdf> (abstract #0005).