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W and Mo isotopic constraints on the age and origin of CH/CB chondrites

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The CH and CB chondrites show petrographic and isotopic characteristics that sharply distinguish them from other chondrite groups [*e.g.*, 1]. As such, they can provide crucial insights into early Solar System processes, but chronological and isotopic data are sparse. To better constrain their formation timescales and their genetic relationship, we obtained W and Mo isotopic data for the CH chondrite Acfer 182 and several CB chondrites. An internal Hf-W isochron for Acfer 182 yields an age of ~3.8 Ma after CAI formation, in excellent agreement with the average Hf-W model age for CB metal separates ($\Delta t_{CAI} \approx 3.7$ Ma). Additionally, CH and CB metals show indistinguishable nucleosynthetic Mo isotope anomalies (ε^{*}Mo ≈ 1.3). Combined, these data not only indicate that CH/CB chondrites formed later than most other chondrite groups, but also imply a close genetic relationship. Our results, therefore, are consistent with the formation of CH/CB chondrites from a common reservoir, probably in the vapor plume of a late impact event [2].

[1] Krot, A.N. et al. (2002) Meteorit. Planet. Sci. 37, 1451-1490. [2] Krot, A.N. et al. (2005) Nature 436, 989-992.

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