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Resolution of small differences in the time of core formation in iron meteorite parent bodies.

Kleine*, T., Kruijer, T.S., Fischer-Gödde, M., *Institut für Planetologie, WWU Münster, Wilhelm-Klemm-Str. 10, 48149 Münster, thorsten.kleine@wwu.de.

Secondary neutron capture induced during cosmic-ray exposure modifies the W isotope composition of iron meteorites, and hampers the precise determination of ^{182}Hf-^{182}W ages for core formation. Recently, it has been shown that Pt isotopes provide a powerful *in-situ* neutron dosimeter and that with combined Pt and W isotope measurements the pre-exposure $^{182}W/^{184}W$ of a given group of iron meteorites can be precisely constrained [1,2]. We present Pt and W isotope data for the major groups of magmatic iron meteorites (IIAB, IID, IIIAB, IVA, IVB) and demonstrate that their pre-exposure $^{182}W/^{184}W$ vary by ≈5-20 ppm. The corresponding Hf-W model ages range from ≈1 to ≈3 Ma after CAI formation. We interpret these age differences to primarily reflect different melting temperatures of the irons, which are controlled by their S contents. However, additional analyses of other groups of magmatic irons are needed to validate this interpretation. Combining the Hf-W constraints with thermal modeling suggests that the parent bodies of the irons accreted several 100 ka after CAI formation.

[1] Kruijer, T.S. et al. (2013) EPSL 361, 162–172. [2] Wittig, N. et al. (2013) EPSL 361, 152–161.

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