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The abundance of ^{180}W in solar system materials: radiogenic vs. nucleosynthetic effects.

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The relative abundance of ^{180}W is variable between different iron meteorites [1]. This isotopic heterogeneity was previously interpreted to dominantly reflect nucleosynthetic heterogeneity of p-process ^{180}W . However, p-process ^{174}Hf appears uniformly distributed in the solar system, which would imply that similarly refractory nucleosynthetic carrier phases underwent different nebular processing – an unlikely scenario [2]. Moreover, ^{180}W appears variable between IVB group irons [3]. Radioactive decay of ^{184}Os , which was previously predicted but never observed in particle counting experiments [4], may therefore better explain ^{180}W heterogeneities. Here, we show based on combined ^{180}W and Os-W concentration data that ^{180}W heterogeneities in meteorites can indeed be explained by ^{184}Os -decay. Consequently, it is inferred that the distribution of non-radiogenic, i.e. p-process related ^{180}W in the solar system is uniform at the level of ≤ 1 ϵ -unit.

[1] Schulz et al. (2013) EPSL 362, 246-257. [2] Peters & Münker (2012) EMC2012-724. [3] Cook et al. (2013) LPI #1719. [4] Sperlein & Wolke (1976) J. Inorg. Nucl. Chem. 38, 27-29.

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