Studying late accretion and planetary differentiation using the ^{184}Os-^{180}W decay system

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The abundance of ^{180}W in iron meteorites is variable and differs from the terrestrial value. Previously, we have shown that this variability can largely be explained by in situ radiogenic production of ^{180}W by α-decay of ^{184}Os ($t_{1/2}$ ~1.1×10^{13} year) [1]. Consequently, geological processes that fractionate Os from W may be recorded in the ^{180}W inventories of planetary materials. Here, we elaborate on the possibility that the ^{180}W inventory of the silicate Earth was affected by the mixing of chondritic material that was derived from a 'late veneer' into the mantle. Furthermore, we demonstrate that terrestrial silicates display a resolvable deficit in ^{180}W relative to chondrites that is consistent with core formation ~4.5 Ga ago followed by differentiation of the silicate mantle. Some technical issues related to improving measurement precisions of ^{180}W are discussed. [1] Peters et al. (2013) *LPI* 1719, 2073