The distribution of *p*-process ^{190}Pt in the early solar system

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Previous work reported a *p*-process deficit for isotopes of the heavy elements Sm and Nd, based on bulk measurements of carbonaceous chondrites [1]. Platinum is an ideal element to search for collateral effects, because it has six naturally occurring isotopes that are a mixture of *p*- (^{190}Pt), *s*- (^{192}Pt) and *r*- ($^{194, 195, 196, 198}$Pt) process. It has been shown that variations in *s*- and *r*-process Pt isotopes in iron meteorites are the result of exposure to galactic cosmic rays (GCR), and not heterogeneous distribution of different nucleosynthetic components in the early solar system [2] [3]. However, no published data of sufficient precision exist for ^{190}Pt, because of the small abundance (0.014 %) of this isotope. Here we present new ^{190}Pt data for the IAB, IIAB, IIIAB, IVA and IVB iron meteorites.

Platinum is purified following a procedure adapted from [4]. A second ion exchange column has been developed to separate Ir, which causes tailing effects onto Pt. Finally, Pt cuts are dried in perchloric acid in order to volatilize any remaining Os, which generates isobaric interference on Pt. Samples are measured using a Neptune *Plus* MC-ICP-MS with a Cetac Aridus II desolvating nebulizer, fitted with standard H cones. The Neptune *Plus* is fitted with two 10^{12} Ω amplifiers that are used to measure ^{190}Pt and ^{188}Os. The external reproducibility for the ^{190}Pt/^{195}Pt ratio is ~ 3 ε.

New data for the IIAB and IIIAB iron meteorites indicate that there are no anomalies in *p*-process ^{190}Pt, within current detection limits. This implies a homogeneous distribution of ^{190}Pt throughout the solar system, and agrees well with results from other heavy *p*-process isotopes for these meteorite groups, i.e. ^{180}W and ^{184}Os [5-7]. These isotopes also display no detectable anomalies with nucleosynthetic origins. Additionally, at our improved precision (compared to previous studies [2] [8]), we confirm the lack of nucleosynthetic anomalies for the *s*- and *r*- process Pt isotopes.

[1] Andreasen & Sharma (2006) *Science* **314**, 806-809. [2] Kruijer *et al*. (2013) *EPSL* **361,** 162-172. [3] Wittig *et al*. (2013) *EPSL* **361**, 152-161. [4] Rehkamper & Halliday (1997) *Talanta* **44**, 663-672. [5] Cook *et al*. (2014) *GCA* **140**, 160-176. [6] Peters *et al*. (2014) *EPSL* **391**, 69-76. [7] Walker (2012) *EPSL* **351-352**, 36-44. [8] Kruijer *et al*. (2014) *Science* **344,** 1150-1154.