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Distribution of heavy p-process isotopes in extraterrestrial materials

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The discovery of nucleosynthetic isotope anomalies for p-process ^{180}W in iron meteorites has provoked interest in the distributions of other heavy p-process isotopes in early solar system materials [1]. Such studies are analytically challenging, because of the low relative abundances of p-process isotopes. We present analytical strategies and data on p-process ^{174}Hf in extraterrestrial silicate materials, as well as preliminary data on p-process ^{190}Pt in irons. We found that ^{174}Hf , and possibly also ^{190}Pt , were homogeneously distributed in the solar system at the time of parent body formation. These observations challenge the interpretation of a nucleosynthetic origin for the ^{180}W anomalies. One possible explanation is that ^{180}W was carried by a presolar phase that survived nebular processes after carriers for ^{174}Hf and ^{190}Pt had been destroyed. Importantly, the homogeneous distribution of ^{174}Hf and ^{190}Pt indicate that the ^{176}Lu - ^{176}Hf and to lesser extent the ^{190}Pt - ^{186}Os chronometers are unaffected by nucleosynthetic heterogeneity.

[1] Schulz et al., 2011, Goldschmidt Confer. Prague

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Cite abstract as:

Peters, S.T.M., Münker, C., Schulz, T. (2012) Distribution of heavy p-process isotopes in extraterrestrial materials. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2012/0186.pdf> (abstract #0186).