Contribution ID: **6** Type: **Oral presentation**

Astrophysical signatures in meteorites and their components, with emphasis on p-process

Thursday 17 October 2024 14:00 (50 minutes)

Study of the isotopic compositions of meteorites and their variations has revealed signatures that can be related to processes of nucleosynthesis in stars. Generally, the size of variations scales inversely with the size of the phases that show such "anomalies". For the small effects seen in "bulk"it is not always trivial distinguishing astrophysical variations from such of more mundane origin. The largest effects are seen in "pre-solar grains", i.e., "stardust", and the study of silicon carbide grains, in particular, provides a wealth of information on the s-process. Bulk compositions of primitive chondrites, on the other hand, define the "Solar System abundances"(e.g., [1]). Among isotopic variations that are relevant with respect to p-process nucleosynthesis and cosmochemistry, prominent and having received the most attention are observations related to the presence and decay in the Early Solar System of now-extinct radioactive nuclides such as 92Nb, 97Tc and 146 Sm (see, e.g., [2]). Especially useful for setting constraints on properties of the p-process and possible variability are those cases where an element has more than one p-only isotope, like, e.g., Mo, Ru and Xe. Interestingly, Mo isotopes indicate no variability in the 92Mo/94 Mo ratio, nor in the ratio of p- to r-process contributions, between presolar SiC grains and bulk meteorite samples [3], while [4] favor a different p/r mixing ratio for Ru in refractory metal nuggets from the Allende meteorite. Finally, the ratio of the two p-only Xe isotopes 124Xe/126 Xe in presolar nanodiamonds is distinctly different from that in the average p-process contribution to the Solar System [5].
References: [1] Lodders K. (2003) ApJ 591, 1220. [2] Lugaro M. et al. (2018) Progr. Part. Nucl. Phys. 102, 1. [3] Stephan T. et al. (2019) ApJ 877, 101. [4] Fischer-Gödde M. et al. (2018) Astron. J. 156, 176. [5] Ott U (2014) Chemie der Erde-Geochemistry 74, 519-544.

Length of presentation requested

Oral presentation: 25 min + 5 min questions (Review-type talk)

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Observations

Authors: Dr OTT, Ulrich (Atomki, Debrecen); OTT, Ulrich

Presenter: OTT, Ulrich

Session Classification: Afternoon session