**Chondrites do not Match the Highly Siderophile Element Composition of the Earth´s Mantle - Constraints From new Rh/Ir and Au/Ir Data on Peridotites**

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The abundance excess and approximately chondritic proportions of highly siderophile elements (HSE) in Earth´s mantle commonly have been interpreted in terms of an influence of late accretion on the budget of these elements in the silicate Earth. Recent HSE data on fertile peridotites and komatiites, however, suggest that Pd/Ir, Pd/Pt and Ru/Ir in the primitive upper mantle (PUM) model composition are slightly suprachondritic, while other HSE ratios are chondritic. If representative for the silicate Earth, these deviations from chondritic ratios may reflect a slightly different composition of impacting bodies during late accretion in the inner solar system, or variable distribution coefficients during core formation, or both. Here, we report new abundance data of Rh, Au and other HSE in the same sample aliquot for fertile and depleted terrestrial peridotites. The data were obtained by digestion in a high-pressure asher, chemical purification, measurement by ICP-MS and internal standardization using isotope dilution data. Rh/Ir in lherzolites and harzburgites is constant at 0.35 $\pm$ 0.04 ($1\sigma$, n = 22), similar to values of ordinary and enstatite chondrites, but unlike values of carbonaceous chondrites. The Rh/Ir data show no correlation with peridotite fertility, thus suggesting compatible behavior of Rh during typical melting or refertilization processes. Because of the compatible behaviour of Rh, enhanced (ordinary or enstatite chondrite like) Rh/Ir in peridotites is not easily produced by igneous processes, and thus, like the suprachondritic Ru/Ir of peridotites, is likely an indigenous feature of PUM. Combined with a mean Ir abundance of 3.5 $\pm$ 0.4 ng/g in PUM from previous studies our new data yield a $Rh_{PUM}$ abundance of 1.23 $\pm$ 0.14 ng/g (1 $\sigma$). In contrast, Au/Ir varies as a function of Al content, with harzburgites showing Au/Ir as low as 0.1 and fertile lherzolites displaying Au/Ir near 0.6. Thus, the behavior of Au during igneous processes appears to be most similar to the moderately incompatible elements Re and Pd. Because of substantial scatter, the absolute abundance of gold deduced for the PUM model composition yields a relatively imprecise $Au_{PUM}$ abundance of 2.00 $\pm$ 0.8 ng/g ($1\sigma$), in accordance with previous estimates. Au/Ir values in fertile lherzolites match those of enstatite chondrites, but not ordinary or carbonaceous chondrites. In the Rh/Ir-Au/Ir diagram the most likely composition for fertile mantle would lie inbetween the fields of ordinary and enstatite chondrites. These data, together with suprachondritic Pd/Ir and Ru/Ir inferred previously, suggest a unique composition of PUM that is different from any known primitive meteorite group.

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