

New constraints on the abundances of siderophile volatile elements in Earth's mantle

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Obtaining reliable abundances of siderophile volatile elements (SVE) in the bulk silicate earth (BSE) requires precise and accurate estimates of abundances of SVE in Earth's mantle, and for the more incompatible elements (e. g., Tl), also in the crust. Most commonly, abundances of SVE in the mantle have been determined by using ratios of SVE to lithophile elements of similar bulk compatibility in oceanic basalts, or by direct measurements of SVE concentrations in fertile mantle lherzolites. For some elements (e. g., Cd), significant discrepancies exist in the literature between peridotite-derived concentrations and basalt-derived concentrations of elements in the BSE, the cause of which has not been clear. For other elements (e. g., Ag), the uncertainty of the concentration in the mantle is large. We have developed isotope dilution-ICP-MS methods for the SVE Cu, Ag, In, Cd and Tl (+ Bi by internal standardization) and the lithophile incompatible elements Ba and Sm. The lithophile elements are used to constrain the igneous behavior of the SVE. We will compare peridotite data with data from basalts and discuss which estimates for SVE in the BSE should be updated.