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The dependence of siderophile element partitioning on pressure, temperature, fO_2, and Si- and S-contents.

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The partitioning of siderophile elements between liquid metal and liquid silicate provides information about the conditions that dominated during core formation in the Earth and other terrestrial planets. We have chosen the refractory elements Ni, Co, W and Mo, as well as the moderately volatile elements Ag, As, Au P, Ge, Cu and Sb and the volatile elements Sn and Pb for the investigation of their partitioning behaviour at pressures and temperatures between 11-23 GPa and 2200-2800 K respectively. S-contents range from pure Fe metal to FeS and oxygen fugacities of -2 to -5 log units relative to the iron-wüstite buffer have been determined, resulting from variable amounts of FeSi and FeO added to the starting metal material.

Our results show that increasing S-contents (>10 wt % in the metal phase) can explain the relative abundances of Sn and Pb as well as of Ge, As and Ag in the Earth´s mantle. We furthermore found that the interaction of Si with the elements of interest counteracts the effect of low fO_2 which normally results in increased siderophile behaviour.

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