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New Metal / Silicate Partitioning Data for the Siderophile Elements Ag, Pb, Sn, Au and Cu in S-free and S-bearing compositions.

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Siderophile elements partition preferentially into the metal phase during core formation, preserving prevailing temperature, pressure and oxygen fugacity conditions. We investigated the partitioning behaviour and the influence of the light element S, that is likely to be present in the Earth's core, for a wide range of elements. Therefore liquid metal – liquid silicate experiments were performed at 11, 18 and 23 GPa and temperatures between 2264 K and 2783 K in a multi anvil apparatus. The oxygen fugacities have been determined to lie between –1.8 and –2.6 log units relative to the iron-wüstite buffer. The S-bearing compositions exhibit 14-18 wt% S in the metal phase. We found that decreasing temperatures lead to increasing partition coefficient values for Ag and Au, whereas Pb, Sn and Cu mainly remain unaffected. The addition of S causes a decrease of partition coefficient values for Sn and Au, whereas it influences the partitioning of Ag by increasing its siderophilicity and does not significantly affect Pb and Cu.

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