Precise and accurate determination of In and Sn abundances in geological materials by isotope dilution MC-ICP-MS

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Tin and Indium are moderately chalcophile/siderophile and cosmochemically volatile elements. Owing to their cosmo- and geochemical properties (e.g., condensation temperatures), a detailed investigation of both Sn and In abundances in meteorites and primitive mantle will allow to place constraints on the accretion history and evolution of the Earth. However, these constraints are hampered by the lack of precise and accurate concentration data for Sn and In in silicate rocks and meteorites. This is partly due to analytical difficulties, for example the instability of Sn in low-molarity acids and the low abundance of In in many samples. Analytical problems are overcome by the application of sophisticated analytical techniques, i.e., isotope-dilution analyses in combination with chemical separation, a method that is especially powerful for the determination of low-abundant trace elements [1]. Additionally, MC-ICP-MS overcomes the high ionisation potential of Sn and allows to precisely monitor isobaric interferences (e.g., Cd, Te, Xe).

Here we present precise and accurate data for Sn and In abundances for various geological reference materials, including BHVO-2, W-2, BIR-1, NIST SRM 612, JA-1, AC-E, and UB-N. Only ~ 2-3 ng In and ~20 ng of Sn are required for a single high-precision measurement. The long-term reproducibility is typically better than 1 % (2 sd) for In and better than 5 % (2 sd) for Sn as determined by the multiple digestion and analyses of all analyzed reference materials

[1] Heumann, K. G. (1988). Isotope dilution mass spectrometry. In: Adams, F., Gybels, R. & van Griecken, R. (Eds.): *Inorganic mass spectrometry*. Wiley & Sons, New York