

Elemental fractionation during LA-ICP-MS analysis related to Ar plasma conditions

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Laser ablation inductively plasma mass spectrometry (LA-ICP-MS) is widely used in geochemistry as a sensitive tool for multi-elemental analysis of natural samples. Despite huge efforts over more than two decades open questions remain with respect to the underlying processes causing matrix effects i.e. elemental fractionation, mass load effects, laser-induced fractionation etc.

To contribute to the better understanding of fundamental aspects we report the results of a series of tests focusing on the elemental fractionation attributed to the conditions of the Ar plasma. These tests have been carried out using a set of 5 silicate glass standards (NIST-SRM-610 and -612, BAM-S005B, DING-ATHO-G, USGS-BHVO-2G) and a carbonate (USGS-MACS3).

The results challenge the applicability of the commonly applied instrumental tuning criterion ($\text{ThO}/\text{Th} < 0.5\%$).