

Measurement of major, trace element and Pb isotope in Silicate glasses by LA-Q/MC-ICP-MS

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A method was developed for the in situ analysis of major-trace elements and Pb isotopes by laser ablation Quadrupole/multi-collector inductively coupled plasma mass spectrometry (LA-Q/MC-ICP-MS) for silicate glass samples. By the nanosecond laser ablation conditions, including laser spot size $160\mu\text{m}$, ablation frequency 15Hz and energy density $18\text{J}/\text{cm}^2$, and in accordance with the 1:9 ratio of the laser ablation aerosol that mixed with the corresponding makeup gas, we can get accurate major-trace elements content and Pb isotopic ratios. Using Ca as internal standard element, most element contents generally matched the preferred values within 15%, relatively high relative deviations for some elements (e.g. Cr, Ga) may have been caused by lower recommend values of some standards. The measured Pb isotopic ratios were in good agreement with the reference or published values within 2 σ measurement uncertainties, the analytical precision of $^{207}\text{Pb}/^{206}\text{Pb}$ was better than 74 ppm.

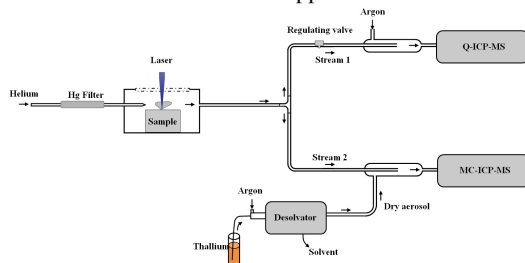


Fig.1. Schematic diagram of LA-Q/MC-ICP-MS setup.

The method has advantages of simple, rapid and efficiency, provides a precise approach for determining the major, trace element and Pb isotopic compositions of silicate glass and mineral within a single ablation event.