Improvement of in situ Fe isotope analyses of silicate reference glasses with a synthetic Cr standard by femtosecond-MC-ICP-MS

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Here we investigate further *in situ* Fe isotope measurement using Cr isotopes to correct iron isotope determinations for mass bias, instead of Ni and Cu isotopes as previously done. A Cr standard was synthesized in our laboratory. Five major oxides except FeO were added in proportion of basalts to keep matrix-match and 20000ppm Cr from NIST SRM 979 was added for mass bias and interference correction. Our results show that samples with low Cr concentration, i.e. BCR-2G and T1-G, δ^{56}Fe values agree with those from solution MC-ICP-MS data within the measured precision without Cr isotope corrections. For high Cr concentration (^{54}Cr/^{54}Fe>0.0001), i.e. BIR-1G, BHVO-2G, KL2-G, ML3B-G, GOR128-G and GOR132-G, δ^{56}Fe values deviate from reference values only by sample–standard bracketing method. A set of eight reference glass samples which included reference materials with varying Cr concentrations, were used to test the our method using the combined standard-sample bracketing with the external standard of Cr using femtosecond-MC-ICP-MS. Results are in excellent agreement with published values and δ^{56}Fe reproducibility is below 0.13‰ (2σ), demonstrating that our interference correction method is an important tool for providing high-quality *in situ* Fe isotope data in high Cr concentration geological samples.

[1] Horn et al., *Geochim. Cosmochim. Acta.,* 2006, **70**, 3677–3688. [2]Weyer and Schwieters, *Int. J. Mass Spectrom.*,2003, **226**, 355–368.