

## **In situ Nd isotope analyses in geological materials with signal enhancement and non-linear mass dependent fractionation reduction using laser ablation MC-ICP-MS**

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In this study, we investigated the effects of three different cone combinations and the addition of N<sub>2</sub> with the guard electrode either grounded or floating on the performance of Nd isotope analyses in order to improve the precision and accuracy of *in situ* Nd isotope analyses in geological samples. Signal enhancements (2.5-3 folds) were observed for the Jet or standard sample cone + X skimmer cone compared to the standard sample cone + H skimmer cone with addition of 3 or 6 ml min<sup>-1</sup> N<sub>2</sub> in the GE-on mode while in the GE-off mode, N<sub>2</sub> decreased the signal intensity of Nd. The addition of nitrogen to the central gas flow in laser ablation MC-ICP-MS was also found to not only significantly enlarge the mass bias stability zone, but also in suppressing this non-linear mass dependent fractionation for the combination of X skimmer cone with Jet sample cone or standard sample cone. The accuracy and precision of the developed Nd isotope analytical method of using Jet sample cone + X skimmer cone with the addition of nitrogen has been demonstrated by analyzing a series of reference glasses (JNdi-1 glass, LREE glass, NIST 610) and minerals (apatite, monazite and titanite). Results are in excellent agreement with published values, demonstrating the capability of the developed analytical method as an important tool for providing high-quality *in situ* Nd isotope data in geological samples.

[1] K. Newman, *J. Anal. At. Spectrom.*, 2012, **27**, 63-70. [2] Z.-C. Hu *et al.* *J. Anal. At. Spectrom.*, 2012, **27**, 1391-1399.