

高精度ホウ素同位体比迅速分析法の地下水・火山岩への応用 Applications of rapid and precise $^{11}\text{B}/^{10}\text{B}$ isotopic analysis to water and rock samples

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Boron isotope ratio is a powerful tracer in the fields of geochemistry, biochemistry, and environmental chemistry. Boron isotope ratios are determined by TIMS or MC-ICP-MS with precisions of better than 0.1 % RSD, but a large inter-lab discrepancy of 0.6 % is still observed for actual carbonate samples (Foster, 2008). Here, we are trying to determine B isotope ratio by MC-ICP-MS with a simple and common analytical techniques using a quartz sample introduction system with a PFA nebulizer, and compared to recently developed precise B isotope ratio analysis techniques by TIMS in positive ion detection mode determined as Cs_2BO_2^+ ions with sample amount of <100 ng (Ishikawa and Nagaishi, 2011) and by MC-ICP-MS (Foster, 2008, Louvat et al., 2011).

In this year, our developed B analytical method above for carbonate and water samples are applied to rock samples. Resultant analytical reproducibility (twice standard deviation) was ± 0.04 % with a consumption of 50 ng B for several geochemical reference rocks issued from GSJ. Their relative differences from the standard were consistent with those determined by the positive TIMS within analytical uncertainty. Current potential B isotopic analysis by MC-ICP-MS will be discussed.