The effect of matrix interferences on *in situ* boron isotope analysis by laser ablation MC-ICP-MS

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Boron isotope analysis has become a key geochemical tool for understanding Earth-based processes; for example, applications range from a palaeo-pH proxy for seawater in studies concerned with ocean acidification to a tracer for mixing processes in studies of the ocean-crust-mantle system. Laser ablation multi-collector inductively-coupled-plasma mass spectrometry (LA-MC-ICP-MS) permits the *in situ* collection of geochemical information on minimal sample material at high spatial resolutions, with the added benefit of high sample through-put. However, despite these clear advantages over traditional methods, the adoption of laser ablation techniques to studies concerning boron isotopes has not been straight forward, with numerous authors reporting significant levels of imprecision (typically 1–2 ‰ $\delta^{11}B$) and inaccuracy (up to 6 ‰ $\Delta\delta^{11}B$) compared to alternate analytical techniques [1, 2].

Here we explore the role of matrix interferences on boron isotope analysis by LA-MC-ICP-MS and present a protocol for obtaining accurate $\delta^{11}B$ data following mass bias correction with the universal NIST glass standard SRM610. Critically, our protocol enables small-scale investigations of boron isotope heterogeneities in a range of samples without the need for matrix-matched standards, which are themselves often difficult to obtain and/or characterise. Our methods will be further demonstrated through timeseries analysis of a section of a *Siderastrea siderea* core collected from the Southern Belize portion of the Mesoamerican Barrier Reef System.

[1] Mikova *et al.* (2014) *J. Anal. Atom. Spectrom.* **29**, 903–914. [2] Thil *et al.* (2016) *Rapid Commun. Mass Sp.* **30**, 359–371.