

Are barium isotopic signals in planktic foraminifera a proxy for palaeosalinity?

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Reconstructing ocean circulation and freshwater inputs is of crucial importance when trying to understand the global climate system and its variability. Water mass conditions are reconstructed employing different geochemical proxies often measured in foraminifera. The Ba/Ca ratio in foraminiferal carbonate shells is considered a proxy for nutrient and alkalinity distributions in seawater [1] and has been used as a freshwater tracer [2]. However, results from Ba/Ca ratios in foraminifera do not always agree with those obtained from other proxies, for example oxygen isotopes. In order to overcome these problems we develop stable Ba isotopes in foraminifera as a quantitative tracer for riverine fresh water inputs. It has been shown that rivers have systematically light barium isotope compositions, whereas the more saline ocean surface waters show an inherently heavier isotopic signal [3;4]. We will discuss our analytical efforts to extract Ba isotope compositions from planktic foraminifera. We will present the results of tests of three different cleaning methods (reductive cleaning, DTPA and flow through) performed on four species-specific foraminifera samples and the establishment of a standard in the form of giant clam reference material (Jct). Samples were measured on a Nu instruments MC-ICPMS applying a double spike method.

[1] Lea & Spero (1994), *Paleoceanography* 9 (3), 445-452

[2] Plewa K et al. (2006), *Paleoceanography* 21 (2)

[3] Horner et al. (2015), *EPSL* 430, 511-522

[4] Cao Z. et al. (2016), *EPSL* 434, 1-9