

Barium isotopic heterogeneity of seawater inferred from coral skeleton data

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Barium (Ba) concentration in marine sediments is used as paleoproductivity proxy but some limitations in the understanding of the oceanic Ba cycle weaken this use. The use of Ba isotope ratios may help to better constrain the oceanic Ba cycle, thus bypassing the limitations in paleoproductivity reconstruction.

Measurements of the Ba isotopic composition of biogenic marine carbonates provided us with a first order view of the marine Ba isotope cycle. Coral skeletons, in particular, allow us to estimate the isotopic composition of dissolved Ba in the growing milieu.

The results of the present study show heterogeneous $\delta^{137/134}\text{Ba}$ values from the same coral genus (*Porites* sp.) from different locations. Even if some minor variability of the $\delta^{137/134}\text{Ba}$ values are observed within the same monitored experimental environment, the observed coral heterogeneity is best explained by differences in the local seawater isotopic composition. Further, the Ba isotopic fractionation between seawater and coral skeleton follows a similar pattern as experimental inorganic precipitations^[1,2].

Thus, coral skeletons are a promising archive for Ba isotope variations in the oceans, potentially allowing us reconstructing the Ba isotope composition of seawater through time and space.

[1] Böttcher, M. E. *et al* *Isotopes in Environmental and Health Studies* **48**, 457–463 (2012). [2] von Allmen, K. *et al* *Chemical Geology* **269**, 210–219 (2010).