

Interactive comment on “Decoupled carbonate chemistry controls on the incorporation of boron into *Orbulina universa*.” by E. L. Howes et al.

Anonymous Referee #2

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"general comments"

The submitted discussion paper provides a boron data set (d11B and B/Ca) of foraminifera from a culturing study performed modifying pH and [CO₃²⁻] in a decoupled way. It relates to an interesting topic: proxy calibration for paleoreconstruction of key parameters of the marine carbonate system. While the efforts involved in culturing are truly acknowledged the extend of data and its discussion unfortunately are not great. As it stands I would consider this manuscript as a data brief and I am not convinced it will make an exciting contribution to BG.

"specific comments"

Most of the method section's content can be found in the cited literature. Thus, it get's too much space in the manuscript and could be moved into a dedicated part of the

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Discussion paper



supplements. The normalization procedures for $\delta^{11}\text{B}$ read confusing. I assume $\delta^{11}\text{B}$ of the culturing water has been measured, as the data are provided in table 1. I do miss information on how these data have been generated. I would assume using MC-ICPMS, relative to NBS SRM-951? The water composition is massively modified (10x B concentration and about 35 permil lighter than natural seawater). That's fine, the normalization should allow for comparability of the data. So, water data are presumably expressed relative to NBS951 (conventional $\delta^{11}\text{B}$ notation). LA-MC-ICPMS data relate to NIST SRM-610. Nothing is mentioned about any further normalization, regarding differences between both SRMs. It appears the authors assume both to have identical boron isotopic composition. When using a standard of an entirely different matrix during the laser analysis of foraminifera (silicate vs. carbonate), and ablating quite different amounts of both, some justification is needed to convince readers that no offsets (analytical artefacts) compromise the data.

Have the foraminifera shells been treated chemically prior to laser analyses (e.g. oxydative cleaning)?

Nothing is mentioned about the quite large variability within the $\delta^{11}\text{B}$ data of foraminifera within each treatment group. How do you explain this observation? And considering this variability I am somewhat surprised the data (figure 3A) do match the inorganic borate curve (Klochko-curve) more or less perfectly. Statistically this is almost impossible, considering the mean 2SE to be >1.5 permil.

I regret but cannot recommend this manuscript for publication in BG.

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