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Biogeosciences Discussions

Interactive comment on "δ^{11}B as monitor of calcification site pH in marine calcifying organisms" *by* Jill N. Sutton et al.

Anonymous Referee #3

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The manuscript by Sutton et al reports the boron isotope compositions of various marine calcifyers (coralline red alga, urchins, worm, coral, oyster). All the samples came from culture experiment (T=25°C, pCO2=409 μatm) and so should record the same δ11B values if no vital effects are present. The δ11B range of all the data is about 20‰ and seems to show the biological control on the calcification pH. I found the data interesting, but I think that there are a lot of repetitions through the text. Even if it is mentioned in the case of coralline red alga, the influence of B3 is not really taken into account. For example, the presence of B3 was also shown in corals, and it was not described in the text. In the figures, the symbols should be different between the calcium carbonate polymorphs.

More technical comments: -L53: B(OH)4- -L85: please mention the study of Noireaux

et al (2015) -L108, 127: "2" must be in superscript -L142: please mention the study of Noireaux et al (2015) -L151-152: Please mention the studies of Rollion-Bard et al (2003, 2011) -L154: Please mention the study of Jorgensen et al (1985) -L221: Interest for what? Why the data are not shown in the manuscript? -L243-244: It was already mentioned, please delete -L256: I suppose that there are older references than McCulloch et al (2014) for the MC-ICP-MS method. - section 3.1.1.: Do you have an idea why the measurements on JCt-1 are more variable? -L288, 324: please add the errors on the δ11B values -L290: Why the error on the δ11B value of the coralline alga is so high? -L327: "range in range", please correct -L334: No, in Noireaux et al (2015) there is a clear effect of the mineralogy (see figure 1) -L358: please remove the part of the sentence concerning boron isotopes. In this sentence, it is explained that there is an enrichment of 11B in corals and that it is supported by 'boron isotope analyses' (of course!). -L370-371: What would be the pH of calcification if there is effectively 30% of B3? The δ11B value of coralline alga could result from the combination of a pH increase and the incorporation of a certain proportion of B3. -section 4.2.3: What are the calculated pH if the results of Noireaux et al (2015) for inorganic calcite are taken into account? -L402: please remove 'Notably....worm tubes' -L420: Klochko et al (2006), instead of Klochko (2009) -L420: please remove 'Notably....oysters' -L477: Kakihana et al (1977) instead of Kakihana (1977) -L495: It is obvious. I do not see the point here. -section 4.3.3: It was already mentioned, please delete this section

Table 3: 'JCp-1' instead of 'JCP-1'.

Figure 1: Please use the alpha of Klochko et al (2006) and specify in the caption the pKa used and the alpha used. Figure 2: Please add data of Reynaud et al (2004), Lécuyer et al (2002), Farmer et al (2005). Please use the full name species of the foraminifera. 'Brachiopod' instead of 'Brochiopod'; 'Penman' instead of 'Penmen'.

Table S1: In the caption, specify the pKa and alpha used.

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