

Biogeosciences Discuss., community comment CC1
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Reviewer comment on Comment on bg-2021-167

Jeff Chanton

Community comment on "Hydrogen and carbon isotope fractionation factors of aerobic methane oxidation in deep-sea water" by Shinsuke Kawagucci et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-167-CC1>, 2021

I was asked to review this paper by the editor Jack Middelburg. I agree with the authors treatment of the data, and their interpretation of it.

1. I do think it is important that they clearly state the temperature of the seawater where they made their measurement. They state that the vent fluid temp was 229C in line 91 and the other site was 323C, line 88. In the graphs, figure 2, they report the temperature differential. Is that relative to these reported fluid temps? or to what?? The fraction factor for methane oxidation is sensitive to temperature as found in the reference below, so the authors should be crystal clear about the temperature at which they made their measurements.

2. Rather than call the height of the water column above the seafloor as altitude, it should be referred to as height above the sea floor.

Chanton, J. P., D. K. Powelson, T. Abichou, D. Fields, & R. B. Green. 2008. Effect of Temperature and Oxidation Rate on Carbon-isotope Fractionation during Methane Oxidation by Landfill Cover Materials, Environmental Science and Technology No 42, pp 7818-7823. DOI 10.1021/es80122y.