

Interactive comment on “Impact of reactive surfaces on the abiotic reaction between nitrite and ferrous iron and associated nitrogen and oxygen isotope dynamics” by Anna-Neva Visser et al.

Anonymous Referee #2

Received and published: 20 June 2020

This manuscript investigates in detail chemodenitrification mechanisms and presents an attempt of using nitrite isotopic analyses to increase processes understanding and ability to distinguish them. This is an important and interesting study, manuscript is in general well organised and reader-friendly. I have two main points to be clarified: 1) the SP values of N₂O - some of your values are extremely low - down to -120 permil, which is absolutely implausible value - at least so far no known process could explain these values. You ignore them in your results description and discussion. How reliable are these results? Why to show them and not discuss them? I think they must be wrong,

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probably due to some problems with measurements. But this makes me question all the SP values of N₂O - if we see such a large bias for some samples, are we sure other results are true? Especially when your SP data are significantly lower compared to previously published values. Maybe all your values are underestimated? If you cannot explain this I would suggest to remove these data from the manuscript - this will also do without these data and will not bring confusion for the further studies. 2) abiotic N₂O reduction to N₂ - in some places you say it is unclear if this is possible, in other you say results suggest this occurs (I have also indicated this in the attached file). There is no clear point about this process in the manuscript.

Please find the further specific comments in the attached pdf file.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2020-73/bg-2020-73-RC2-supplement.pdf>

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-73>, 2020.

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