

Interactive comment on “Impact of impurities in bromocresol green indicator dye on spectrophotometric total alkalinity measurements” by Katharina Seelmann et al.

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Received and published: 6 March 2020

Reply to the comments of Truls Johannessen (Referee #2) (received on 06 Feb 2020)

First, we thank Truls Johannessen for the evaluation of our manuscript and his highly supportive comments. We answer each comment point-by-point in the following text.

Comment #1: This paper is general well written and the presentation of results are appropriate and comprehensive, and their arguments that indicator purification increase the quality of the alkalinity measurements are well justified and summarized in figure 4

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and 5.

Answer #1: Thank you for this supportive evaluation of our manuscript. We appreciate it.

Comment #2: The important issue now is: To what degree can their results be justified and used by other groups using the same instrument set up as Seelmann et al did? The cost assessment seems to give an additional dimension to the paper. Of course, we should always strive towards simplification and better cost efficiency as long as this don't cause a compromise to the precision and accuracy of measurements required to address scientific questions pursued. The benefit here must always be balanced by the general costs of the fieldwork campaign and costs related to manpower in use. These costs often greatly exceed the costs in performing the analytical work and then it will be better to make sure that measurements are performed the best way there is. There is a clear recommendation and the end of the paper claiming the following lines 260 and 268: “To achieve the best long-term measurement experience with the analyzer it is not necessary to use purified BCG, as the purest available indicator (e.g. BCG from TCI) generate fully satisfying quality results. Users of the CONTROS HydroFIA TA should take the consequences of indicator impurities into account when choosing their BCG supplier. From this perspective, it would be beneficial to invest into higher purity indicator avoiding the issues described above. If applicable, an HPLC analysis of the used indicator following the here described analytical method can show any types and quantities of impurities. However, if there is no HPLC available, long-term laboratory measurements as described here can help to evaluate whether the purchased indicator is suitable or not by evaluating the drift behaviour.” This paper is a valuable contribution to the scientific community dealing with delicate measurements, in this case of the carbon system variable alkalinity. It stimulated discussions related to the use of different dye(s) and their purity. This is convincingly stated in lines 255-257: “Finally, if we compare the purified BCG with “high-purity” BCG like from TCI, the only benefit gained from the purification is a reduced drift per AT measurement. There is

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no improvement in the measurement quality (precision and accuracy) as long as the impurity level is 2 % or below.”

Answer #2: Thank you for this supportive conclusion of our paper. It shows us that we will contribute beneficial information to the scientific community by publishing our results.

Comment #3: My conclusion is that this paper can be published with minor revision (typos).

Answer #3: We highly appreciate this evaluation of our manuscript. Thank you! We will do our best to correct all typos before publication.

Interactive comment on Ocean Sci. Discuss., <https://doi.org/10.5194/os-2019-126>, 2020.