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Ocean Science
Discussions

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

Anonymous Referee #1

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Referees Comments

Firstly, the paper justifies the effort on the assumption that impurities in BCG indicator impact spectrophotometric total alkalinity measurements. It seems to be good paper. Three things were true that led to spectrophotometric pH requiring BCG purification are the impurities in dyes, the impurities cause drift in total alkalinity for the system used for the novel autonomous analyser CONTROS HydroFIAr TA and lastly no two sets of dye had the same impurities.

On a similar note, the authors claim that BCG with impurity quantities higher than 6 % provided AT values, which failed fundamental quality requirements but still conclude

that to gain optimal AT measurements, an Indicator purification is not necessarily required as long as the purchased dye has a purity level of at least 98 % and they are able to provide quality measurements to avoid identified issues. I don't see how this is true. Purification of dye is expensive but then it is not strictly recommended by the author to carryout high quality measurements. I guess with high quality measurements nothing should be compromised. I think there are benefits to this approach, but the authors need to be clearer and accurately spell out what they are as stated in abstract (line 6-7) that impurities and quality of impurities do impact the drift behaviour of the analyser. So my question is that how accurate are these total alkalinity measurements using the analyser and are they taken into account when the total alkalinity is determined.

Second, assessment: I have concerns that characterisation of the pure BCG and impure BCG would results in separate values for the extinction coefficients. I don't see any section in paper that shows the characterisation of pure BCG was conducted.

If the paper is accepted for publication, I hope the authors could make their points clear so the reader could make proper decision for their research needs.

There are typos in the manuscript which I feel needs to be restructured. Specifically Line 3 influences from impurities. I believe it should read as influences of impurities.

Line 8: Could you please specify the kind of drift. Whether there is change in total alkalinity or how the drift is caused by the impurities. Lines 40 describe to described.

Section 2.2 It is stated that all analysis were carried out in air conditioned labs. My question is based on the temperature range for the instrument and sample what was the approximate temperature conditions. As I believe that most of the indicators have a temperature range where they are most effective and work the best.

Line 106-107 was the purified BCG prepared using the sodium salt in order to make sure that samples and indicators are of similar ionic strength? Line 120 Equation 2 shows how the precision was calculated. It would be nice to show in the form of an

equation how the total alkalinity for the samples was calculated as well.

Line 144 additionally could be changed to ‘in addition to’

Line 178 reset to ‘resets’. What is the frequency of cleaning the analyser? Could you specify please. And are standard runs or CRM used in between runs to maintain the calibration.

Line 189 to 191. There is something wrong and it is difficult to understand. Probably reword or restructure the sentences so that it is easy to understand. I don’t understand how the characters the author is mentioning in this section. Was pure BCG characterised?

Line 199 Figure 5 appears on page 12. Could it be moved closer to where it is mentioned in the text for easier referral?

Line 204 Author refers to paper by Seelmann et al., 2019 and refers to accuracies I when compared to CRM. It would be nice to at least state some values here so that it is easier for the readers to follow though.

Lines 215 reword the sentence probably.

Line 217- 229 how the total alkalinity measurement deteriorates. This section is a bit confusing as the author tries to show total alkalinity and with that talks about the precision and accuracy. Could the author be more specific? Probably with the help of equation or something how their system compares to other studies.

Line 245 what does FC refer to in this section.

Line 250 with BCG i.e. can be changed to ‘using BCG’

Lines 257 delete ‘be’

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