

Interactive comment on “Technical Note: How long can seawater oxygen samples be stored before titration?” by M. Lankhorst et al.

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Received and published: 1 December 2014

I am a chemistry technician at SIO's Oceanographic Data Facility (ODF) and analyzed many of the dissolved oxygen samples referenced in this paper. ODF goes to sea on research cruises for CLIVAR, GEOTRACES and many other programs which demand high quality, time sensitive data. We use automated endpoint detection software and have found that duplicate oxygen measurements can be within +/-0.006ml/l, and strive for this standard even when different technicians collect or analyze the samples. The value of 0.046ml/l used as a "standard range" for duplicates in this paper, taken from Dickson's reference, would be considered unacceptable in any of our data and I don't understand the justification for using it over the also-mentioned 0.003ml/l from Langdon, 2010. In addition, ODF's standard practice is to run samples within a few hours,

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not a few days as mentioned in the paper, so increasing storage to a week, or even a month, is quite drastic. The experimental setup for the cruise on the Melville described in this paper is a good test of the hypothesis that dissolved oxygen samples taken at sea don't need to be run right away, but instead can be saved and run on shore. Multiple variables were tested, namely different analysts used different equipment, and the duplicates were good for 6 out of 8 samples. One was 0.017ml/l higher on shore and another must have been mis-sampled and can be discarded. Allowing for that, some groups may find these results to be "good enough" not to bring a technician to sea. However, there were many variables that allow for that in this case, but wouldn't apply for the majority of oceanographic expeditions. Specifically the short duration of the cruise, low number of samples, and ending in the port of San Diego. The cost of buying and calibrating enough flasks for longer expeditions when hundreds or even thousands of samples are taken would be prohibitive. Also, shipping or other transport of collected samples would be expensive and perhaps not even possible given the hazardous reagents involved and the water seal on the stopper. Additionally, many programs require samples to be analyzed same day, with technicians working around the clock, as a system evaluation. The New Horizon cruise data is insufficient for making any conclusions as samples were not run onboard so there is no reference sample. Furthermore, only 2 of the 9 sets of duplicates run 3+ weeks apart are within ODF's acceptable range of +/- 0.006ml/l. While there are many variables that can slightly affect the data, including the suggested titration "standard" value, these are accounted for by running standards and blanks before the analysis on each day and thus cannot be blamed for the discrepancies seen. This data cannot be used to determine whether onboard analysis is required since duplicates were not run while underway, but it is clear that running samples a month after collection resulted in unacceptably different values.

Interactive comment on Ocean Sci. Discuss., 11, 2447, 2014.

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