

Interactive comment on “Sensors and instruments for oceanic dissolved carbon measurements” by U. Schuster et al.

Anonymous Referee #1

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This paper provides a comprehensive review of ocean carbon chemistry and the methodologies for measuring the various parameters that make up the ocean carbon system. As such no new data is presented or interpreted. This, however, does not distract from the paper.

The authors explain the science behind ocean carbon cycles and go on to fully describe the advantages and pitfalls of the analytical techniques used for the individual parameters and the sensor technology that has recently emerged. Where relevant they have included reference to instrument/sensor inter-comparison exercises. The paper covers both inorganic and organic ocean carbon and I believe is one of the best reviews of the methodologies, particularly of the inorganic parameters of pH, alkalinity and CO₂ fugacity, that I have seen. My only criticism is that paragraphing is a bit odd

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with topics split across paragraphs (this could be a result of document format) and the English phraseology could be improved; some suggestions follow. This list may not be exhaustive so further editorial checking may be required.

p 497 line 24 ...at atmospheric pressure is rather small in the concentration range of interest here, so pCO₂ is frequently used.

p498 line 5/6 given in Dickson et al., 2007 and it is reported in units of pressure.

p500 line 10. Equilibrium in discrete seawater samples is achieved either by pumping, using a closed circuit, a known volume of air through a known volume of seawater in a flask, or by introducing a known small volume of air into a sealed sample bottle filled with sea water.

p501 line 3. Continuous mode equilibration is achieved by pumping a fixed volume of air around a circuit which contains an 'equilibrator' where the CO₂ equilibrates between a continuous flow of sea water and a counter flow of air.

p501 line 20. flow type and a combination of these types in one equilibrator ...

p501 line 22 do not start new paragraph.

p502 line 1 do not start new paragraph.

p502 line 4 sentence ...Equilibration in continuous mode ... This is not required unless it is designed as a heading - if so it needs underlining. There are statements, which I have discussed above that also fall into this category so the authors need to check.

p504 line 3 do not start new paragraph

p506 line 20 delete comma

p508 line 7 ... from the measured absorbance, temperature, salinity and the

p508 line 9 delete 'being'

p513 line 25 ... need for further development of instruments with respect to accuracy,

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precision and long term stability in order to provide data at the urgently required increased spatial and temporal resolution.

p514 line 1 don't start new paragraph.

Interactive comment on Ocean Sci. Discuss., 6, 491, 2009.