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Interactive comment on “On CO₂ perturbation experiments: over-determination of carbonate chemistry reveals inconsistencies” by C. J. M. Hoppe et al.

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Certainly it is possible to change $p(\text{CO}_2)$ calculated from total alkalinity and total dissolved inorganic carbon by recognizing the existence of an additional acid-base system. See also:

Hernández-Ayón, J. M., Zirino, A., Dickson, A. G., Camiro-Vargas, T., & Valenzuela, E., 2007. Estimating the contribution of organic bases from microalgae to the titration alkalinity in coastal seawaters. *Limnology & Oceanography, Methods* 5, 225–232.

The key question is can one really have enough of such in seawater DOM? For example in Millero et al. (2002) they suggest 8 $\mu\text{mol/kg}$ of "unidentified" acid-base system. For

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the functional groups are carboxylic acids thus requires at least 2 or more carbons per mole of "acid/base system". This is hard to justify given what we do know about DOM in seawater.

Certainly if the seawater used for this experiment was from a coastal region with limited opportunity for exchange even with the main North Sea, then this could be a plausible rationale. However, it seems unlikely as a sole cause of the discrepancies noted.

Interactive comment on Biogeosciences Discuss., 7, 1707, 2010.

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7, C1294–C1295, 2010

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