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(CO₂) calculated from total alkalinity and total dissolved inorganic carbon by recognizing the existence of an additional acid-base system. See also:


The key question is can one really have enough of such in seawater DOM? For example in Millero et al. (2002) they suggest 8 µmol/kg of "unidentified" acid-base system. If 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.