

Interactive  
Comment

## ***Interactive comment on “Effects of the pH/ $p\text{CO}_2$ control method in the growth medium of phytoplankton” by D. Shi et al.***

**D. Shi**

dshi@princeton.edu

Received and published: 13 May 2009

We are glad that the reviewers found our work interesting and will provide detailed answers to their specific comments. Here we simply wish to clarify the objective of our study and address three general issues raised by the reviewers.

The main objective of our paper is to discuss the various methods of controlling the acid base and inorganic carbon (DIC) chemistry of seawater medium for phytoplankton cultures, and examine how these different methods affect the growth of two model species. We take it for granted that the readers understand the basic acid base/DIC chemistry of seawater and the interdependence of the key parameters. Although we did show some specific data on calcification and photosynthesis for the coccolithophore *Emiliana huxleyi* under two pH/ $p\text{CO}_2$  conditions, we did not intend to report in this

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



paper detailed physiological data on the effects of pH/pCO<sub>2</sub> on phytoplankton.

The three main points noted by the reviewers were: the DIC/Alk/pH/pCO<sub>2</sub> analysis of the seawater media, the use of buffers and the effect of bubbling.

We used a single batch of Sargasso seawater to prepare the culture media for all of our experiments and the seawater and the media were analyzed for alkalinity (Gran titration), DIC (Membrane Inlet Mass Spectrometry), and pH (potentiometry).

As reported in the paper, the use of organic buffers can create artifacts when studying the uptake and effects of trace metals at varying pH. Nonetheless such buffers, which have been widely used in microbiology, can be quite useful to control pH/pCO<sub>2</sub> in some experiments. Our intent is not to advocate the use of buffers for studying ocean acidification but simply provide background information for those who may want to use them.

Both reviewers are correct that the negative effect on growth we observed in bubbled cultures cannot be unambiguously assigned to the mechanical effect of bubbling itself. We shall qualify our discussion accordingly. Nonetheless it is worth noting that, in our hands, it has been more difficult to obtain reproducible data in cultures where pH/pCO<sub>2</sub> is controlled by bubbling than by other methods.

---

Interactive comment on Biogeosciences Discuss., 6, 2415, 2009.

**BGD**

6, C406–C407, 2009

---

Interactive  
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

