

Interactive
Comment

Interactive comment on “Impact of seawater $p\text{CO}_2$ changes on calcification and on mG/cA and sR/cA in benthic foraminifera calcite (*Ammonia tepida*): results from culturing experiments” by D. Dissard et al.

Anonymous Referee #1

Received and published: 6 May 2009

This paper is the result of a series of batch experiments in which the shallow-water benthic foram *Ammonia tepida* was cultured in seawater media at two CO_2 concentrations and two temperatures. As such it adds further experimental information concerning the effects of an acidifying ocean on calcifying organisms. Furthermore, the paper presents data on the effects of changing CO_3^{2-} and DIC concentrations on the partitioning of Mg and Sr between seawater and the *Ammonia tepida* calcite shell. The major findings of the paper, which are significant and important, are (1) *Ammonia tepida* shell weights decrease with decreasing CO_3^{2-} concentrations and increase with decreasing tem-

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



perature, and (2) CO₂- or DIC concentration changes do not affect the Mg partition coefficient but Sr incorporation in the *Ammonia tepida* shell calcite is increased with increasing CO₂- concentrations. While this paper is probably worthy of publication, I would have liked to see some time course experiments and the experiments done at more than two pCO₂ concentrations. It would have also been informative to determine nutrient concentrations, particularly during a time course experiment. Although I understand why the authors felt they need “to alter physico-chemical conditions beyond the range typically observed in nature”, this also presents a dilemma in that the ΔG of reaction will also be very far from the equilibrium state. This is why experimenters dealing with solid-aqueous solution reactions try to design experiments close to the ΔG of reaction = 0 and maintain that during the time course of the experiment. The paper also begs some questions: Why did the specimens of *Ammonia tepida* calcify at undersaturated conditions and not dissolve? Why are not some of the original papers, like Smith et al. (1979) and Speer (1983), addressing Sr partitioning not mentioned in this paper? Why the differences between the effects of CO₂- and DIC concentrations on the Mg and Sr partition coefficients for *Ammonia tepida* calcite? Finally, there are quite a few typographical errors (even in the title) in the paper that need to be attended to before publication.

Interactive comment on Biogeosciences Discuss., 6, 3771, 2009.

BGD

6, C299–C300, 2009

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

