

Interactive comment on “Technical note: An economical apparatus for the observation and harvesting of mineral precipitation experiments with light microscopy” by Chris H. Crosby and Jake V. Bailey

Anonymous Referee #2

Received and published: 29 January 2017

This is a useful effort and it would be a valuable contribution to the literature. However, some details and other additions would improve its impact for the reader.

Page 2 A reference to add to or replace the Tomson and Nancollas reference is: Morse, J. W. "Dissolution kinetics of calcium carbonate in sea water; III, a new method for the study of carbonate reaction kinetics." *American Journal of Science* 274.2 (1974): 97-107. Morse was the first to propose this method.

Another reference to add about precipitating a mineral within an extracellular matrix by diffusion is Hunter, G. K., et al. "Inhibition of hydroxyapatite formation in collagen gels

C1

by chondroitin sulphate." *Biochemical Journal* 228.2 (1985): 463-469.

For the paragraph that begins on line 20, it would be useful to break this down into at least two sentences.

Line 25, consider replacing "flow" with "diffusion"

Page 3 Line 5: It might also be worth pointing out in some more detail in your text that the Silverman article reviews many diffusion studies within different extracellular matrices with the goal of studying biomineralization.

Line 12: Some more experimental details about the setup, for example some solution concentrations and diffusion times with your setup, would be very helpful for the reader.

Line 19: The example given for dissolving gelatine is quite aggressive; contact with hot water may alter the minerals and/or their precursors generated by the experiment. The statement that other gel materials will require different treatments is quite general; perhaps a statement suggesting that extracellular matrix removal methods must also consider the stability of the precipitation products would be more helpful.

Line 21: The discussion about sealing strategies would benefit from more details. For example, describing a strategy with which you found success would be useful.

Line 29: Please define "thinner" for the reader, or provide example values.

Page 4 Lines 1-5: Providing the details of an experiment, such as how the ECM was set up and inserted into the cell, what its solution composition was, and what the solution compositions were for the other solutions would help the reader to begin testing this method with a system that should provide initially positive results.

Line 11: Please explain how the needles and syringes are used in more detail. Must the user remove the source solutions and then replace them with the next solutions? Can the use of a needle and syringe change the fluid dynamics appreciably for your system?

C2

Figure 1d) The assembly detail could be more clear. The different stages of assembly, to the point of adding the ECM and solutions of interest, would be helpful for the reader to repeat your method.

Figure 1e) The scale of this image is not adequate for observing the Liesegang banding easily. Consider including an inset with a higher magnification.

Question: Do thinner gels heat more rapidly from the light source? Is there a method for monitoring this temperature change, and/or variation within the cell?

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-488, 2016.