

Interactive comment on “Calcium carbonates: Induced biomineralization vs. controlled macromorphology?” by Aileen Meier et al.

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POINT-BY-POINT-ANSWERS TO REVIEWERS COMMENTS

Anonymous Referee #1 Received and published: 17 July 2017 This paper is of great importance from the point of application. It is very well structured, English is understandable and I suppose that it is correct. Only one mistake was found in the abstract, it should be abiotic and not abiotic (line 15). Answer to reviewer comment: We thank the reviewer for pointing out this mistake and gladly revised the mistake.

Particularly important are the illustrations. The paper highlights the possibilities to improve the heritage conservation but there could be many more possibilities to apply the findings. I strongly recommend publication of this paper and will use it in teaching

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microbiology and ecology. We again thank the reviewer for the positive comment.

Anonymous Referee #2 Received and published: 21 July 2017 As a main result of our investigation of 140 isolates of two lithotypes of limestone in Germany, the authors conclude that (magnesium) calcite and vaterite production can be induced through medium alkalinity, through direct surface interaction for nucleation visible in close associations, but also in acidic media and a distance apart from the growing bacteria. This manuscript complements the baseline for the understanding of microbially induced calcium carbonate precipitation, its use and exploitation in environmental technologies. I have only a few comments noted in the pdf attached. Answer to reviewer comment: All comments were corrected according to the reviewer's suggestions (marked in red and posted as supplemental material to the comment to reviewer 2): Abstract: macromorphologies changed to "morphologies" abiotic changed to "abiotic" Introduction: citation included: "(Castanier et al., 1999)". Material and Methods, 2.5 Quantification: included the calculation basics: "For calculation of yearly biomineral formation, we used the amount produced in our cultures (approx. 100 mg) during the time of incubation (3 weeks) to calculate how much this would make in 52 weeks, a full year. 1700 mg would be the result of such an approximate calculation for new mineral formation during a year. This is an underestimation, since the nucleation time is needed only once." Again, we thank the reviewers for their valuable comments!

Also the title is not fully convincing. There is not much doubt that the mechanism is induced. Title was changed to "Calcium carbonates: Induced biomineralization with controlled macromorphology"

We hope that our changes allow for acceptance of our manuscript for publication with Biogeosciences. Should there be further questions, please do not hesitate to contact me again! With best regards, Erika Kothe