

Activity 9 – The Acidification of the Oceans



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Why does CO₂ make the oceans acidic and what are the consequences?

Implementation:

- Put 50 ml of water into a beaker and add 15 drops of the indicator until the solution changes its colour significantly.
- Note the pH value of the solution..

*The PH value is about 7
So the water is neutral.*

- Mix one teaspoonful each of citric acid and baking soda in the Erlenmeyer flask, then carefully add some water and conduct the resulting CO₂ (carbon dioxide) with the tube into the water in the second beaker (see illustration).
- Note the pH value of the solution in the second beaker.

*The PH value is now approximately 2
The solution is now acidic!*

- Describe the test result in one sentence!

Introducing CO₂ into water lowers the PH of the liquid, making it acidic or acidifying.

Evaluation:

Answer the following questions with the help of the background text for Experiment 1 and with an in-ternet search under the QR code shown on the right:



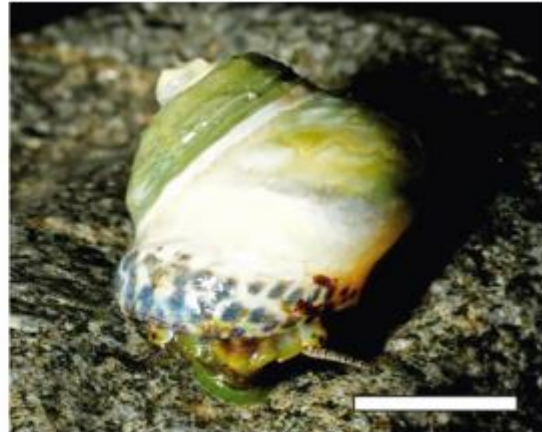
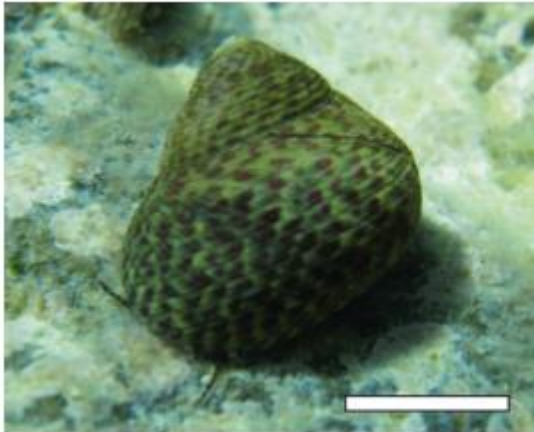
? To what extent do oceans seem to contribute to a slowdown of the man-made greenhouse effect?

The oceans sequester CO₂ from the atmosphere, resulting in fewer greenhouse gases in the atmosphere. In this way, they contribute to a slowdown of the greenhouse effect.

The oceans not only remove CO₂ from the atmosphere, which dissolves in the water, but also heat energy. The oceans thus buffer the man-made greenhouse effect twice - but with serious consequences!

? What consequences does acidification of the oceans have for its creatures?

This has fatal consequences for the life of algae and animals living there, which are not adapted to the increasingly acidic environment. In addition, the shells of calcareous algae, for example, become thinner and corals lose their calcareous skeleton.



Shell of a snail (HallSpencer et al. (2008) auf <https://worldoceanreview.com/de/wor-1/meer-und-chemie/ozeanversauerung/> (12.10.2020))