

Ocean Acidification: Thought Questions

Introductory Video:

<https://mpt.pbslearningmedia.org/resource/nvls-sci-acidification/what-is-ocean-acidification/#.WqFHOHmbPOQ>

1. How are fossil fuels related to ocean acidification?
 - a. Fossil fuels release carbon dioxide gas, which can be released into our ocean.
2. Why weren't scientists initially concerned that the ocean absorbs excess carbon dioxide?
 - a. Because they thought the carbon dioxide was good for the ocean and the animals in it.
3. Describe how carbonic acid is formed in the ocean.
 - a. Binds with other molecules and will kick off a hydrogen.
4. How are oysters affected by decreased availability of carbonate in the water?
 - a. They are not able to create strong enough shells.
5. Besides oysters, what other animals do you think might be in danger from ocean acidification and why?
 - a. Coral and clams because they need the carbonate to create their shell and without it they are not able to form a full shell.

Follow up reading:

<https://www.pmel.noaa.gov/co2/story/What+is+Ocean+Acidification%3F>

Follow up video on ocean pH and its effect on fish behavior:

<https://mpt.pbslearningmedia.org/resource/nvls-sci-researchingimpacts/researching-impacts-ocean-acidification/?#.WqFizRMbPOQ>

Ocean Acidification Lab

Beakers before adding in the oyster shells:

Left-water

Middle-ammonia (high pH)

Right-vinegar (low pH)

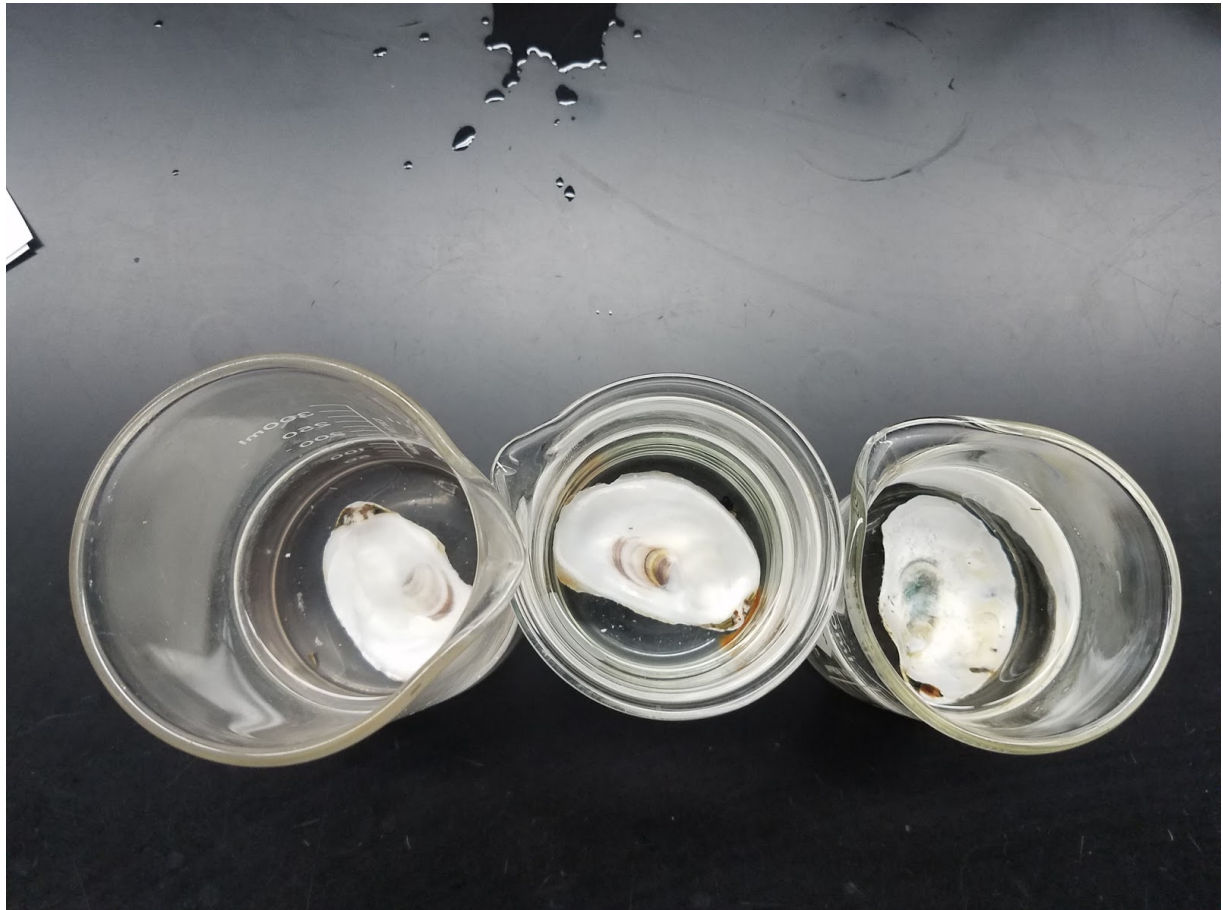


After adding oyster shells

Initial mass of oyster in water: 6.91 grams

Initial mass of oyster in ammonia: 10.05 grams

Initial mass of oyster in vinegar: 8.55 grams



Oysters during drying

Left oyster was in water

Middle oyster was in ammonia

Right oyster was in vinegar



Procedure

1. Discuss the concept of pH and how this links to the oceans and life in the sea.
2. Set up and label 3 cups:
 - Acidic solution: 100ml tap water and 50ml vinegar
 - Basic solution: 100ml tap water and 50ml household ammonia
 - Neutral solution: 150ml tap water
3. Wash each shell to remove any dirt. Dry and record an initial mass in the table below. (being careful not to mix them up)
4. Place 1 shell into each cup.
5. Leave the cups to sit overnight.
6. Lift the shells carefully out of the solutions. Record any visual changes.
7. Dry each shell and record the final mass in the table below. (being careful not to mix them up)

Data Table

	Initial Mass	Final Mass	Change in Mass (final-initial)
Vinegar	8.55 g	7.26	1.29
Ammonia	6.05 g	10.03	.02
Water	6.91 g	6.90	.01

	Visual Observations
Vinegar	flaky, slightly smaller bubbles formed in solution
Ammonia	no visible change
Water	no visible change

water
left

ammonia
~~right~~
middle

vinegar
~~left middle~~
right

Final masses of the oysters and the change in mass

The final mass of the oyster in vinegar was 7.26 grams with a change of 1.29

The final mass of the oyster in ammonia was 10.03 with a change of .02

The final mass of the oyster in water was 6.90 with a change of .01