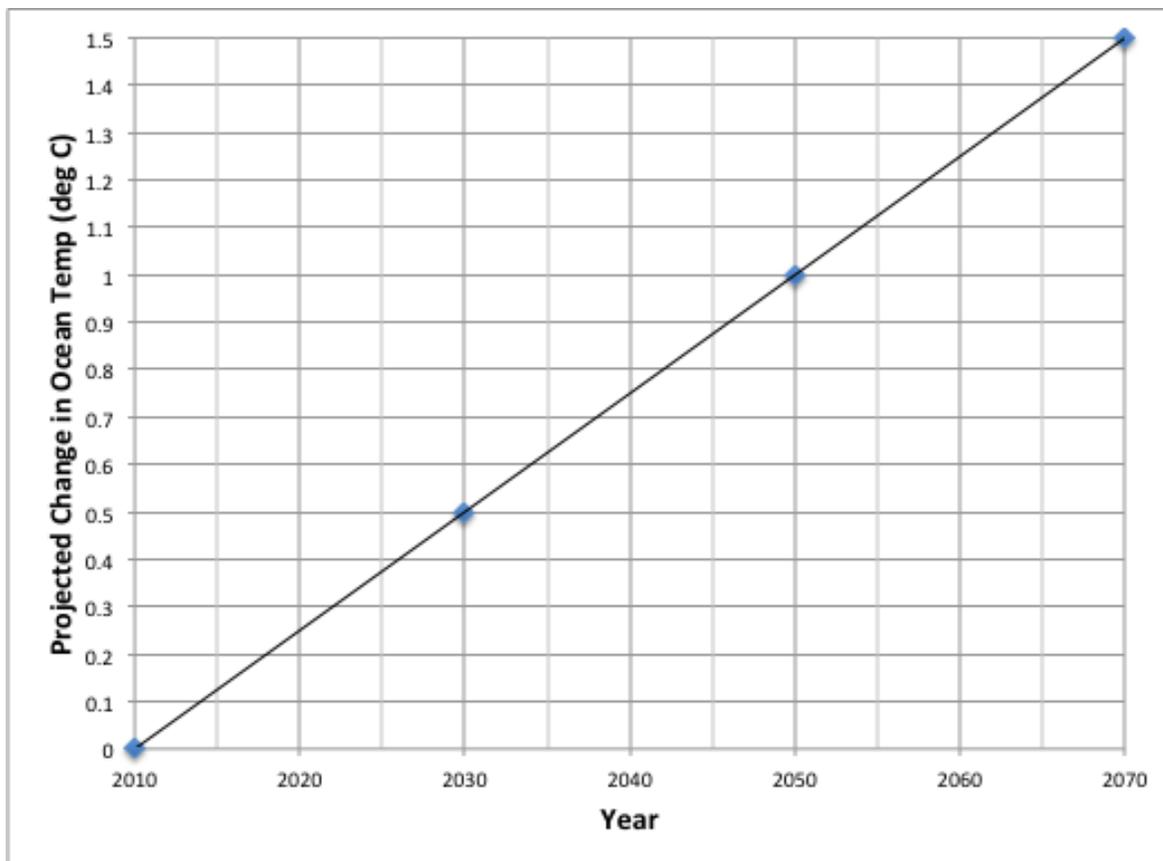


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### ChemCom Topic #8: Acids in the Atmosphere PRACTICE TEST

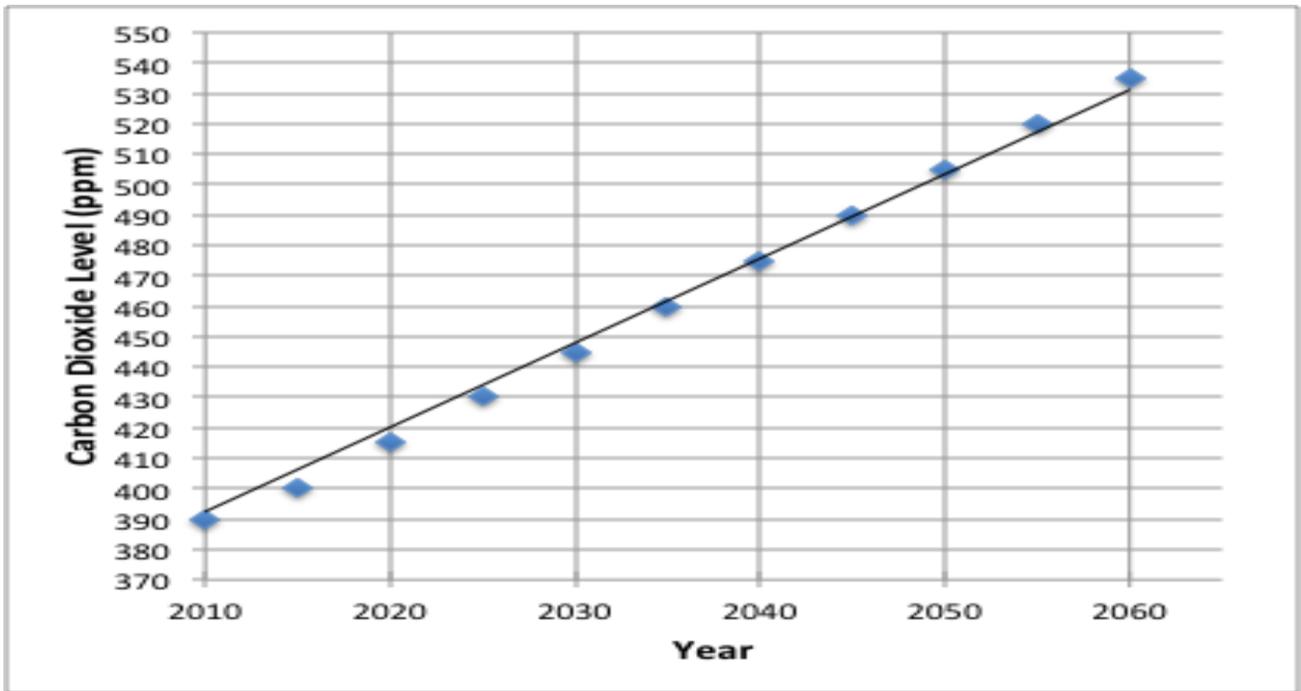
#### Graph Showing the Projected Increase in the Temperature of the Oceans



1. Why is the temperature of the oceans is increasing?
2. How much is the temperature of the ocean projected to change between 2020 and 2060?  
(Use the graph above to find your answer)
3. List two things that will occur as a result of the warmer ocean water?

Use the graph below to answer questions 4-7.

Graph Showing the Current and Predicted CO<sub>2</sub> Levels in the Atmosphere



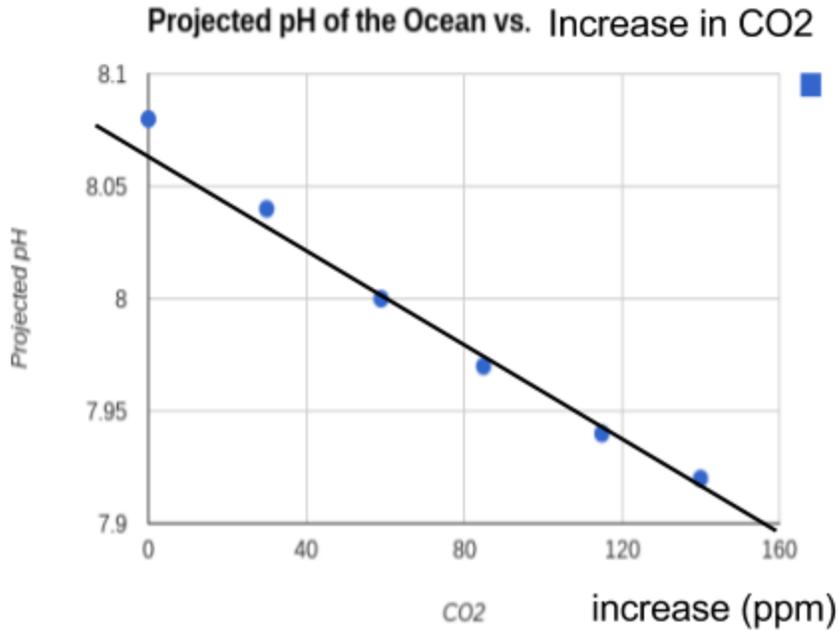
4. What is the projected carbon dioxide level in the atmosphere in the year 2030?

5. How much is the carbon dioxide level going to change between 2030 and 2060?

6. Why are carbon dioxide levels are increasing in the atmosphere?

7. Write a story that describes the graph above?

Use the graph below to answer the following questions 8-12



8. Write a story that describes the trend in the graph above?

9. Based on the graph above, if there is no increase in the level of CO<sub>2</sub> in the atmosphere, what will be the pH of the ocean be in the future?

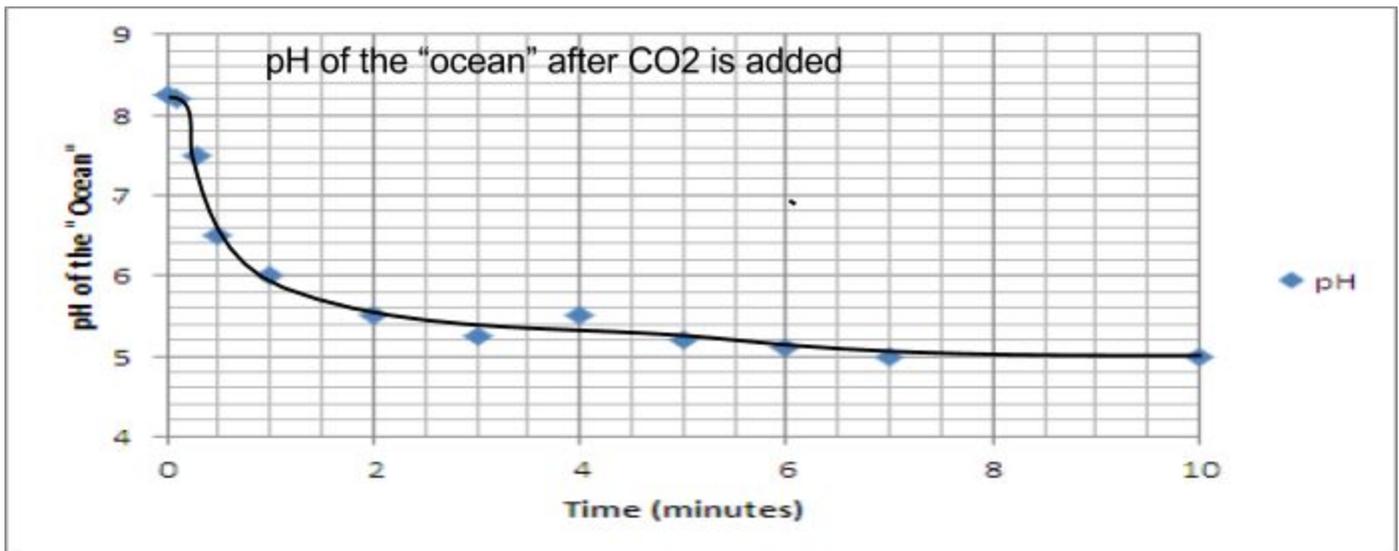
10. Based on the graph above, if the carbon dioxide level changes by 55 ppm in the future, the pH of the ocean will drop to about

11. Based on the graph above, how much will the pH of the ocean **change** if we increase the level of carbon dioxide in the ocean by 55 ppm?

12. Based on the graph above, how many more times acidic will the ocean become if we let the carbon dioxide level increase by 55 ppm?

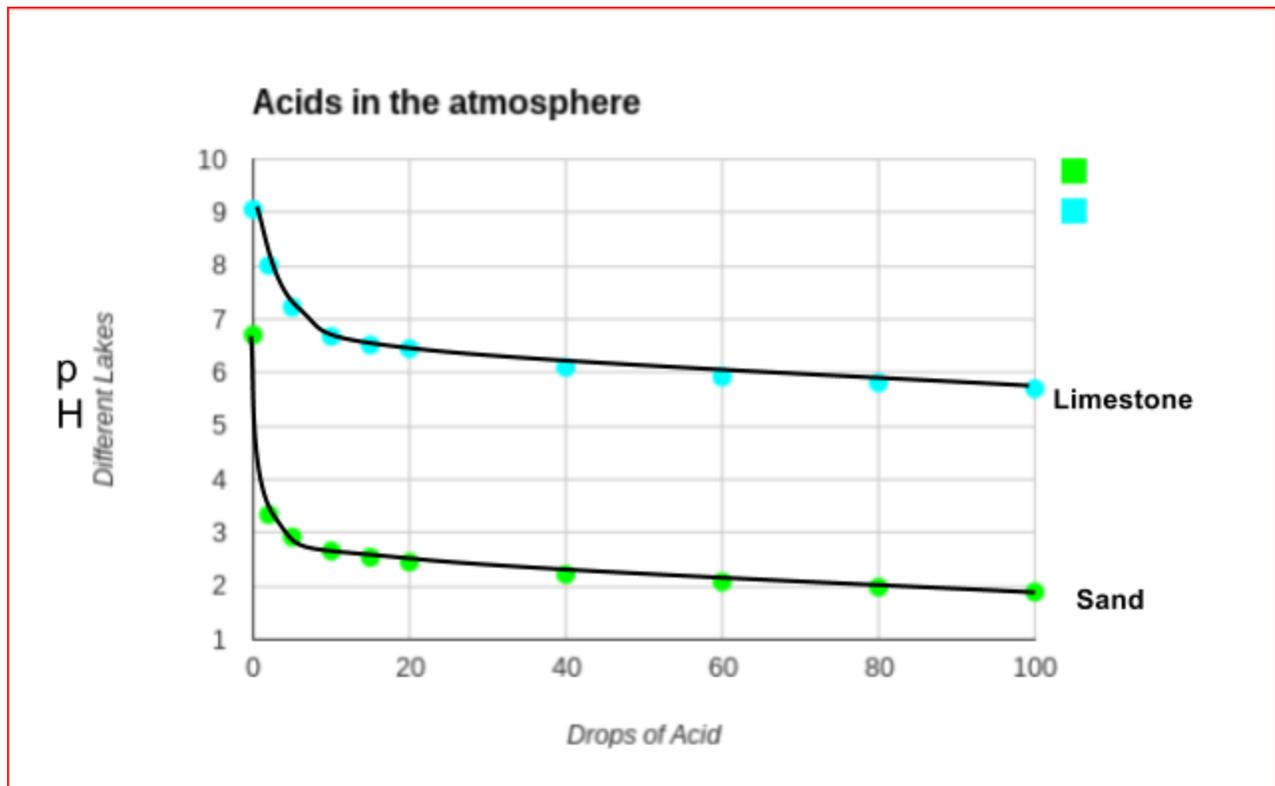
## Ocean Acidification

The graph below shows the pH of a beaker of salt water after a student added solid dry ice ( $\text{CO}_2$ ) to the beaker. Use the graph below to answer the following questions 13-17.



13. At the end of the experiment (Time = 10 min), the sample would be classified as a(n)
  
14. How many minutes passed until the sample was at a pH of 6?
  
15. What was the  $\Delta\text{pH}$  of the ocean water between the beginning of the experiment and 2 minutes?
  
16. How much more acidic was the ocean at 2 minutes of the experiment compared to the beginning?
  
17. Why are the oceans are getting more acidic? (write the chemical reaction)

The graph below shows the pH of two simulated lakes after they received heavy doses of acid rainfall. Use the graph below to answer the questions 18-22.



18. What was the pH of the limestone lake after 40 drops of acid rain were added?

19. Which lake would be considered an base at the end of the experiment? Which lake would be considered an acid at the end of the experiment?

20. Would all of the life in the limestone lake have been killed off by the end of the experiment? Explain why or why not.

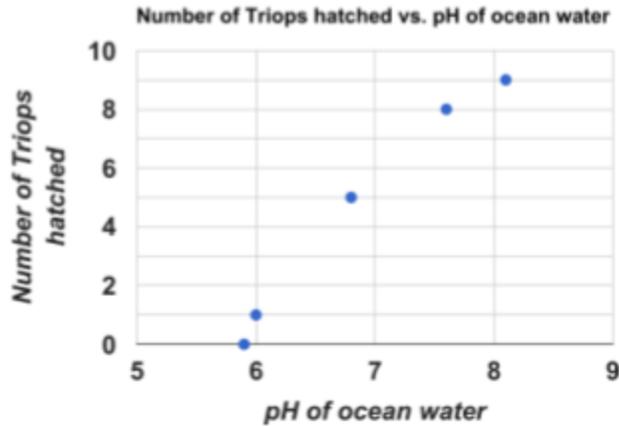
21. How many times more acidic was the sand lake compared to the limestone lake after 20 drops were added?

22. Describe what you could add to the sand bottom lake to raise the pH back to safe levels.

**Use the description, data table, and graph below to answer questions 23-26.**

A student learns living organisms can go extinct when the ocean pH drops significantly. The student conducts an experiment to investigate how changing the pH affects the number of Triops that hatch. She fills 5 beakers with water and adds drops of acid to change the pH of each beaker. She then puts 10 Triops in each beaker and she watches for them to hatch. The data table and graph of her results are shown below.

Beaker	pH of water in the beaker	Triops that hatched
1	8.1	9
2	7.6	8
3	6.8	5
4	6.0	1
5	5.9	0



23. What is the independent variable in the experiment and what is the dependent variable in the experiment?

24. What are all of the constant variables in the experiment?

25. What is the relationship between the independent and dependent variables in the experiment?

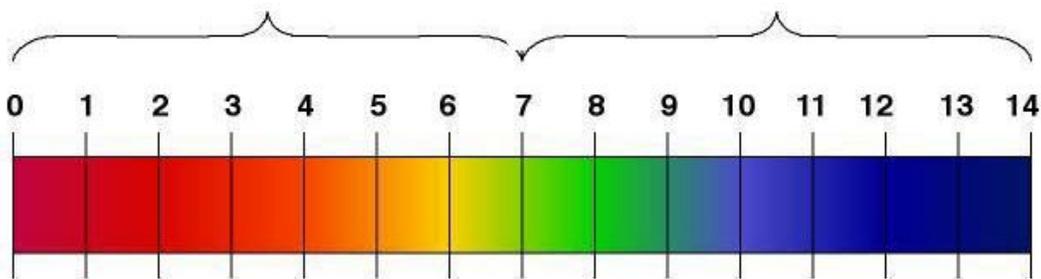
26. The ocean needs to be above what pH value in order for Triops to hatch?

27. What are the reactants and products for all hydrocarbon combustion reaction?

28. What is formed when carbon dioxide is dissolved in seawater?

Write the chemical equation for this reaction.

29. Diagram the pH scale below. Mark the acids, bases, and neutral.



30. What happens to the pH of the ocean when  $\text{CO}_2$  levels increase in the atmosphere?

31. Which of the following compounds represents an acids? Which compounds represent bases?

Which are neither acid or base?

NaOH

HCl

NaCl

$\text{Ca}(\text{OH})_2$