

Activity Sheet Answers

Chapter 6, Lesson 10

Carbon Dioxide Can Make a Solution Acidic

DEMONSTRATION

1. Did the indicator solution become acidic or basic?

When breath is blown into the indicator solution, the solution turns slightly acidic.

2. What chemical from your teacher's breath do you think caused the indicator to change color?

Carbon dioxide (CO_2) gas in breath caused the indicator solution to become acidic.



ACTIVITY

3. What color is the sample of indicator solution in the water and in the carbonated water?

The indicator solution in the water stayed blue-green, but the indicator in the carbonated water turned greenish-yellow.

4. What does the color of the indicator solution tell you about the pH of each solution? Is it acidic, neutral, or basic?

The bromothymol blue indicator solution exposed to carbonated water is greenish-yellow. This means that the indicator solution is slightly acidic. The one in water is still neutral.

5. The carbonated water and water should not have splashed into the indicator solutions. Why did the indicator solution change color in one set of cups?

The indicator solution became slightly acidic and changed color because carbon dioxide (CO_2) gas reacted with water in the solution and formed carbonic acid.

ACTIVITY

6. What color is the sample of indicator solution in the vinegar and in the vinegar and baking soda?

The indicator solution in the vinegar stayed blue-green, but the indicator in the vinegar and baking soda yellow.

7. What does the color of the indicator solution tell you about the pH of each solution? Is it acidic, neutral, or basic?

The bromothymol blue indicator solution exposed to the vinegar and baking soda reaction turns yellow. This means that the indicator solution is acidic. The indicator solution in the cup without the reaction stays blue-green so it is neutral.

8. What was the purpose of having one set of cups with only vinegar, while the other had vinegar and baking soda?

The set of cups with just vinegar is a control. It is used to compare the color of the indicator solution in the vinegar and baking soda cups to see if and how much it changed. If the indicator changed color in the vinegar and baking soda, but not in the vinegar, then you know it was not the vinegar alone that caused the color change.

9. The baking soda and vinegar should not have splashed into their indicator solutions. Why did the indicator solution change color in one set of cups?

The reaction between baking soda and vinegar produces carbon dioxide (CO_2) gas. The gas reacts with the water and forms carbonic acid. This acid causes the color change in the indicator.

DEMONSTRATION

10. Your teacher did a demonstration with a candle flame, a flask, and bromothymol blue indicator solution. When indicator was added to the two flasks, what did you observe?
In the flask that was over the candle, the indicator changed from blue-green to green.

11. What does the color of the indicator tell you about the pH of the solution?

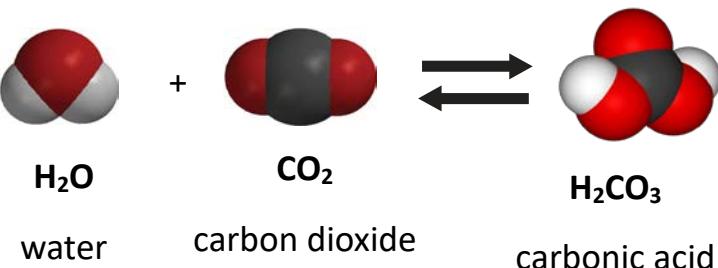
It is acidic.

12. What gas from the burning candle caused the solution to become acidic?

Carbon dioxide gas.

EXPLAIN IT WITH ATOMS & MOLECULES

13. Water and carbon dioxide gas react to produce carbonic acid. As more carbon dioxide is released into the atmosphere, why is that a problem for our oceans?



Carbon dioxide reacts with water in the ocean causing the ocean to become more acidic.

TAKE IT FURTHER

14. According to the video about ocean acidification, what might be an effective way to slow down the ocean from becoming more acidic?

Reducing the amount of carbon dioxide released into the atmosphere from burning fossil fuels.