

Activity Sheet Answers

Chapter 6, Lesson 5

A Catalyst and the Rate of Reaction

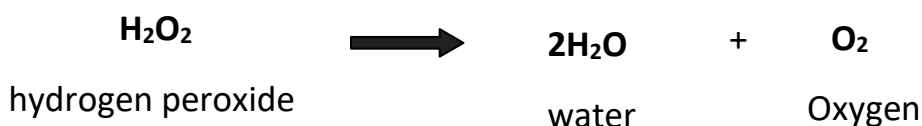
DEMONSTRATION

1. Your teacher showed you videos of two chemistry demonstrations: Elephant's toothpaste and Genie in a bottle. Are both of these chemical changes? How do you know?

Both of these demonstrations involve chemical changes. In both reactions, hydrogen peroxide (H_2O_2) decomposes to form oxygen gas and water. Since these products are different substances than the hydrogen peroxide, the process was a chemical change.

EXPLAIN IT WITH ATOMS & MOLECULES

2. Even though the two demonstrations seem different, the chemical reaction behind both is the same—the decomposition of hydrogen peroxide. Refer to the following equation as you answer the questions below.



- a. Which new substances are created when hydrogen peroxide decomposes?

When hydrogen peroxide decomposes, water and oxygen gas are produced.

- b. Each demonstration used a substance called a catalyst. What does a catalyst do in a chemical reaction?

A catalyst causes the chemical reaction to happen faster.

- c. If the catalyst is involved in the chemical reaction, why isn't it included as a product in the chemical equation?

Even though a catalyst causes a reaction to happen faster, it is not included as a product of the reaction because the atoms of the catalyst do not become part of the products.

ACTIVITY

3. What clues did you have that a chemical reaction occurred in this activity?

When the yeast was added to the hydrogen peroxide, bubbles formed. Production of a gas is evidence that a chemical reaction occurred.

4. What acts as the catalyst in this activity?

The catalyst is a substance in the yeast.

5. What evidence do you have that hydrogen peroxide decomposed faster when you added yeast?

When the hydrogen peroxide was originally in the graduated cylinder, no bubbles were being produced. But when the yeast was added, bubbling started. This means that the chemical reaction was happening faster with the yeast than without it.

6. When writing the chemical equation for this reaction, should yeast be included on the product side of the chemical equation?

Yeast should not be included on the product side of the equation since it acted as a catalyst and did not become part of the products.

TAKE IT FURTHER

7. How do you know that a chemical reaction occurs when a piece of aluminum foil and sodium chloride is placed in copper II sulfate solution?

When aluminum foil and salt are added to a copper II sulfate solution, the blue solution loses its color and a brownish-colored solid is produced. There is also bubbling. These color changes and production of a gas are evidence of a chemical change.

8. What is the catalyst in this activity?

The catalyst in this activity is the salt. Before adding the salt, the copper II sulfate did not react with the aluminum but after adding the salt, it did.

9. How is adding salt to the aluminum similar to adding yeast to the hydrogen peroxide?

Adding salt to the aluminum is like adding yeast to the hydrogen peroxide because in both cases adding the substance caused the reaction to go faster but the atoms of the substance did not become incorporated into the products.