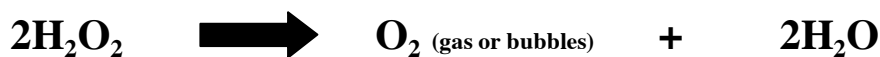


Chemical Reaction Lab
CLASS SET – PLEASE RETURN!

Problem: To observe a typical chemical reaction and identify its various components.

Background: The equation for the chemical reaction to be studied is given below:



The above equation is read: two molecules of hydrogen peroxide (H_2O_2) go to form one molecule of oxygen gas (O_2) plus two molecules of water (H_2O). The 2's in front of the H_2O_2 and H_2O are coefficients, which indicate how many molecules, react in the reaction. The arrow is read as “goes to form”. Molecules to the left of the arrow are called **reactants**, and molecules to the right of the arrow are called the **products**.

The equation is **balanced** if the total number of atoms on the left of the arrow is the same as on the right. The **coefficients are used to balance the equation**. The equation must be balanced or it will violate the *Law of conservation of mass*.

If the reaction **gives off heat**, it is called an *exergonic reaction*. If the reaction absorbs heat (**gets cold**) it is called an *endergonic reaction*.

❖ **All members of your group must answer the questions below before receiving materials for the experiment!**

Questions:

1. Name the products of the above reaction.
2. Name the reactants of the reaction.
3. Is hydrogen peroxide used up or produced?
4. Is oxygen gas used up or produced?
5. How many molecules of water are produced?
6. How many oxygen atoms are on the left of the arrow?
7. How many oxygen atoms are on the right of the arrow?
8. Does the equation satisfy the law of conservation of mass?
9. If you do this reaction in a test tube and it gets cold, what kind of reaction is it?
10. If you do the reaction in a test tube and it heats up, what kind of reaction is it?

❖ **Show the correct answers to the teacher before doing the lab.**

The Experiment:

- Make sure your test tube is clean. Rinsed it out if it is not.
- Add 5 ml of hydrogen peroxide to the test tube (use a graduated cylinder).
- **Activation energy** is the energy needed to start a reaction. If room temperature is just enough activation energy:

1. Do you see bubbles forming? What does this indicate about the reaction?

- A **catalyst** can lower the activation energy; it will make the reaction happen faster at room temperature.
- Add a small amount of sand to the test tube. Observe.

2. Did the reaction speed up? How do you know?

- Add a small amount of Manganese Dioxide (MnO₂) Observe.

3. Did the reaction speed up? How do you know?

4. Feel the base of the test tube. Did it get hot or cold?

5. Is it *exergonic* or *endergonic* reaction?

6. Besides bubbles forming, how do you know a chemical reaction occurred?

7. Name the gas that made-up the bubbles (foam) produced in the test tube.