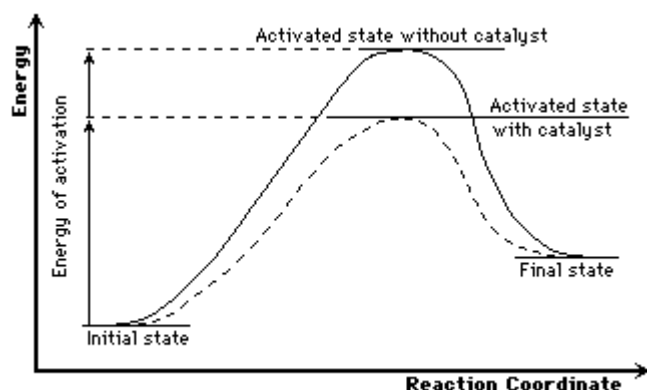


Catalytic Decomposition of Hydrogen Peroxide

Reminder – Goggles must be worn at all times in the lab

PRE-LAB DISCUSSION:

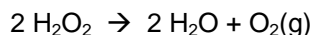


Catalysts are substances that speed up the rate of chemical reactions. It is believed that most catalysts work by providing alternate reaction pathways with lower activation energy than the uncatalyzed reaction.

It is possible to divide catalysts into two groups – inorganic catalysts and organic (biological) catalysts. Biological catalysts are called enzymes. Most enzymes are protein molecules (though recent research indicates that nucleic acids have enzymatic capacities), and they specifically catalyze only one reaction. Many genetic diseases are caused either by the body's inability to manufacture some enzyme, or a mistake in amino acid sequence of the enzyme that causes the enzyme that is produced to work slowly or not at all.

Inorganic catalysts take a wide variety of forms. Metallic surfaces often serve as catalysts for gas phase reactions, such as the conversion of nitrogen oxides back to atmospheric oxygen and nitrogen gas, as occurs in catalytic converters in automobile engines.

In this lab you will investigate the ability of several substances to catalyze the decomposition of hydrogen peroxide, H_2O_2 :



PURPOSE:

To identify which substances have the ability to catalyze the decomposition of hydrogen peroxide, and to identify differences in the rate of the reaction produced by the catalysts.

PROCEDURE:

1. Clean six medium-sized test tubes from your lab drawer. Label them #1 - #6.
2. Obtain 6 mL of 3% hydrogen peroxide solution from your instructor. Divide the 6 mL evenly into the six test tubes.
3. Leave the peroxide alone in test tube #1, and record anything that happens to it during the lab time.
4. Into Test tube #2, place 1 spatula of manganese dioxide, MnO_2 . Record observations.
5. Into test tube #3, place a small sample of beef liver. This was going to be your instructor's lunch. All chemistry instructors eat raw liver for lunch. Record observations.
6. Into test tube #4, place a spatula of table salt, NaCl . Record observations.
7. Into test tube #5, place a small piece of potato. Record your observations.
8. Into test tube #6, place a single piece of zinc metal, Zn . Record your observations.
9. After all of your observations are complete, clean your test tubes and return them to the lab drawer. Any unreacted zinc should be returned to your instructor. Other solids should go in the trashcan.

RESULTS:

Substance	Catalyst? Y/N	Observations
Pure H_2O_2		
Manganese Dioxide		
Beef liver		
NaCl		
Potato		
Zinc		