

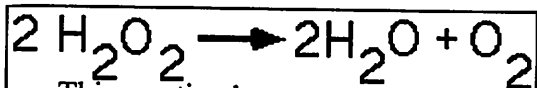
Liver Lab

Demonstration of Enzyme Catalyzed Degradation of Hydrogen Peroxide And Development of an Experimental Design

BACKGROUND:

If you've ever used hydrogen peroxide on a cut you know that the hydrogen peroxide produces a white 'foam'. One way to see this foam is to take a piece of raw liver in a test tube and add some hydrogen peroxide to the liver. Almost immediately the preparation will foam up. This is a great demonstration and one of the few practical uses for liver.

What's going on with the foam? In most of the cells of your body and especially liver cells is an enzyme called catalase or peroxidase which catalyses the following reaction:



This reaction happens very slowly at room temperature, especially in the presence of light but happens much more rapidly in the presence of the enzyme. One question you probably have is why do cells have these enzymes to break down hydrogen peroxide. In cells, these enzymes break down hydrogen peroxide compounds produced by some of the cell's metabolic reactions especially the transfer of hydrogens from organic compounds such as formaldehyde and ethyl alcohol to oxygen. This takes place in organelles called peroxisomes. In some parasites this set of reactions serves to eliminate excess oxygen.

MATERIALS:

One cube chopped beef liver
20 mL Hydrogen Peroxide(3%)
Forceps
Electronic Thermometer
Safety Goggles
100 mL Beaker
10 cc syringe

PROCEDURE:

1. Fill the 100mL beaker with 20 mL of 3% Hydrogen Peroxide using the 10 cc syringes
2. Record the temperature of the hydrogen peroxide measured in degrees Celsius
3. Obtain a piece of liver, return to your station, and add the liver to the hydrogen peroxide
4. Observe the results, record, and take the temperature of the hydrogen peroxide.
5. Dispose of the contents of the beaker in the trash and return empty beaker to front sink.

DATA TABLE

OBSERVATION OF SOLUTION

TEMP OF SOLN.

BEFORE:

AFTER:

Develop an Experimental Design:

After your group has cleaned your station, review your notes on enzymes, catalysts, and activation energy. Also consider the background information from the first page of this lab.

Using the same materials given in this demonstration lab, develop a detailed procedure for a lab activity which would demonstrate, prove, question, elaborate upon, etc. any of the principles we have learned about enzymes. This will require considerable reflection and "brainstorming".

EXPERIMENT TITLE:

PROCEDURE: (use reverse side if necessary)