

Potato catalyst lab essay sample



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Background Information:

An enzyme is catalytic protein. It is the most important type of molecule found in living cells. Cells would not be able to function without enzymes. Enzymes speed up or slow down chemical reactions of the cells. It is usually easy to identify the names of enzymes because they end in -ase. The enzyme that acts upon the substrate hydrogen peroxide is usually called catalase. This enzyme is found in both plants and animals. An enzyme will only work with one substrate. A substrate is the chemical upon which the enzyme acts in the reaction.

Hydrogen peroxide is a toxic chemical that is produced in many organisms during metabolism. In order for organisms to survive, they must get rid of this toxin. Hydrogen peroxide in plants and animals occurs as a waste product of cellular respiration. One chemical reaction turns the hydrogen peroxide into water and oxygen. Enzymes have specific environmental conditions which have positive and negative catalysis impacts. Increasing the temperature will increase reaction time, as well as, increasing the concentration of either the enzyme or reactant.

Purpose:

The purpose of this lab is to use potatoes as the catalase source, and record observations of

the breakdown of the hydrogen peroxide toxin by the potato's enzyme catalase.

Materials:

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Potato (ground, diced, and cooked)

Hydrogen Peroxide

4 Test Tubes

Test Tube Rack

Timer

Graduated Cylinder

Procedure:

1. Fill each test tube with 5 ml of hydrogen peroxide.
2. Label the test tubes 1 through 4.
3. Place 1 gram of ground, diced, and cooked potatoes in test tubes labeled 1-3.
4. Test tube #4 should only contain the hydrogen peroxide.
5. Record how long it takes for the reaction to occur.
6. Clean up experimental area.

Hypothesis:

If the reaction time is related to the state of the potato, then the amount of bubbles will be an indicator of the enzyme catalyzing the hydrogen peroxide breakdown. If the amount of hydrogen peroxide is increased, then the amount of bubbles will be an indicator of the enzyme breakdown. I predict

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that the physical condition of the potato will have an effect on the amount of bubbles produced by the hydrogen peroxide breakdown. I predict that the reaction will begin rather quickly with the addition of the enzyme, but will slow as the addition of amount of potatoes will increase.