Enzyme report

Business

Abstract: This paper contains brief explanations of the enzymes, substrates, active sites, enzyme substrate complex and the enzyme inhibitors. It also contains the objectives, procedures, results and the conclusions of the experiment. Objectives 1) To see the significance of the relationship enzyme-structure function 2) To find out how the enzyme reactions are influence by the changes in the: The concentration of the enzyme, the substrate, the PH, ions, temperature and the inhibitor (CuSO4). 3) To determine the independent t and the independent variables in the experiment. Introduction Many chemical reactions take place in every cell of a human being.

These chemical reactions involve the breaking and the reformation of the bonds between the substrates of the reaction then are transformed into various products of the reaction. Most of these reactions may happen spontaneously while others do not. These also involve the metabolic pathways; the processes that have many chemical reactions occurring in particular way (Copeland 80). There are many factors that influence the enzyme reactions. In this experiment we will examine, some of the factors that influence the activity of the enzyme; catalase. This is an enzyme that is found in many cells but mainly in the liver because of its detoxification function.

The enzyme breaks down the hydrogen peroxide, a chemical that forms in the body during respiration (Cichoke 55). Enzymes Enzymes are biological proteins that are used as catalysts in that they increase the rate of chemical reactions. Their three-dimensional shape is very important in their catalytic activities. Substrates These are molecules that are acted upon by the

enzymes in any reaction. These substrates are converted into other molecules called products.

Therfore, enzymes are the determinants of the metabolic reactions that occur in a cell (Palmer 59). Active sites An active site is that part of the enzyme where the substrates bind and go through a chemical reaction. Various models have been used to demonstrate how the enzymes work. One of them is the lock and key model which takes the active site as the best fit for a particular substrate (Cichoke 80). Enzyme substrate complex It is a complex which is made up of the substrate that is bound to the active site of the enzyme. This is formed whenever there are there are chemical reactions.

The re could be dissociation from the enzyme (Palmer 65). Enzyme inhibitors These are the molecules that interact with either the enzyme so as to prevent its normal working way. These include the non specific, irreversible, reversible; the competitive and the non competitive. Spectrophotometer This is an instrument used to measure the transmission or reflection of the solutions, transparent or opaque solids or gases (Copeland 105). Materials and methods Measuring the amount of O2 produced due to the combination of the catalyses and the hydrogen peroxide (H2O2). Collection of data in terms of the production of one of the products (O2 volume produced in ml) Conversion of the results into enzyme activity units by dividing the volume produced by the time taken by the experiment (ml/min).

The above activities are done in groups of four. For each parts A-F, there is graphing enzyme activity on the Y-axis (the dependent variable) and the independent variable (parts A-F) on the X-axis The materials include:

rectangular bottle fitted with a rubber stopper, metal tube (reaction vessel), a 100ml graduated cylinder and a holder, a plastic pan, and filter papers and turnip extract aand Guaiacol. Fill the pan 2/3 full of tap water, which will quickly become room temperature. Submerge the graduated cylinder to fill it with water. Place a thermometer in the pan and sometime during Part A; record the temperature of the water. Figure 1 shows a picture of the setup.

Procedures 1. Remove the stopper and lay the reaction vessel on its side on the table2. Turn the reaction vessel so that the disks are on the top side and then add 10 ml H2O2 solution. Insert the stopper in the reaction vessel. 3. Keep the side with the disks upward and carefully place the reaction vessel on its side in the pan of water.

4. Get the timer ready! Rotate the reaction 180 degrees so the disks will be covered by the H2O2 solution. 5. Measure the oxygen level in the graduated cylinder at 1 minute (from the time the reaction vessel is turned on its side). 6.

Remove the disks, then thoroughly rinse and dry your reaction vessel Repeat the same procedure with each of the factors above to see the influence of the catalase on them. Results The enzyme was denatured with the increase in the temperature, the increase in the concentration of the enzyme and the substrate. The alteration of the PH levels also denatured the catalase the presence of the inhibitor also stopped further reaction since the enzyme got denatured. Conclusion The higher the concentration of the enzyme, the faster the rate of reaction while the higher the concentration of the

substrate, the slower the reaction rate. Very high temperatures denature the catalyst hence no further reaction.

Most enzymes work best at the PH of around 7. Moreover, changes below or above the optimum PH denatures the enzyme. The different inhibitors have different effects on the reaction. High salt concentrations denature most of the enzymes.