The effect of varying enzyme concentration

The Effect Of Varying Enzyme Concentration On The Breakdown Of Hydrogen Peroxide In The Presence Of CatalaseGrade: 18/18 Words: 3000Hypothesis – Hydrogen peroxide will breakdown to oxygen and water in the presence of Catalase. The reaction will increase with increasing enzyme concentration when molecules of hydrogen peroxide are freely available. However, when molecules of the substrate are in short supply, the increase in rate of reaction is limited and will have little effect. Variables – In this investigation, the variables that affect the activity of the enzyme, Catalase, were considered and controlled so that they would not disrupt the success of the experiment.

i) Temperature – As temperature increases, molecules move faster (kinetic theory). In an enzyme catalysed reaction, such as the decomposition of hydrogen peroxide, this increases the rate at which the enzyme and substrate molecules meet and therefore the rate at which the products are formed. As the temperature continues to rise, however, the hydrogen and ionic bonds, which hold the enzyme molecules in shape, are broken. If the molecular structure is disrupted, the enzyme ceases to function as the active site no longer accommodates the substrate. The enzyme is denatured. To control this variable, the temperature was maintained at a fairly constant level that allowed the enzyme to work effectively (room temperature, approximately 23°C).

This was achieved by using a test tube rack and tongs to handle the apparatus so that the heat from my hands did not affect the Catalase. ii) pH – Any change in pH affects the ionic and hydrogen bonding in an enzyme and so alters it shape. Each enzyme has an optimum pH at which its active site

best fits the substrate. Variation either side of pH results in denaturation of the enzyme and a slower rate of reaction. In this experiment, the pH was kept constant using a pH 7 buffer, selected to maintain a pH level suited to the enzyme by being equal to the natural..

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