Enzyme Activity

LAB REPORT / QUESTIONS

Exercise A, B & C - Results / Data

Before you begin:

Prepare and attach a graph of Absorbance vs. Time for Exercises A-E (combine data from all activities on one graph).

Note: you can access the entire class data set and preliminary graphs from the course web page. To prepare your graph you may elect to isolate your individual groups data and/or use averaged class data to prepare your graph. If averaging data you may need to exclude some data sets that are clearly in error (use caution not to exclude valid data). Graphs may be hand prepared or prepared using Excel. All graphs must be clearly titled and labeled.

QUESTIONS

1) What is meant by the term: “Lock & Key Hypothesis” and how does it relate to an enzyme specificity?

2) What is the difference between an exergonic reaction and an endergonic reaction?
3) Explain how lowering the activation energy of a reaction can increase the reaction rate. Do reactions need an initial investment of energy in order to proceed?

4) Using the graph you prepared:
   a) Explain why the absorbance readings are increasing over time (look particularly at the full strength data).
   b) Explain why the rate of increase in absorbance is rapid during the first portion of the experiment, but tends to slow at the end of the experiment. (If the rate of increase in absorbance in your experiment did not slow; explain why. If enough time were allowed, would you expect to see the reaction slow?)

5) Refer to the data for the full, half (1/2) and quarter (1/4) strength enzyme experiments:
   a) What was the effect of enzyme concentration on the rate of the reaction?
   b) Enzymes are not used up during reactions so why does changing the enzyme concentration affect the reaction rates? Explain:
6) Refer to the data for the heat treated enzyme:
   a) What is the affect of high temperature on enzyme structure?
   b) Why does the enzyme not function as effectively following heat treatment (even if it has been cooled)?
   c) Why does the test tube in the heat treated enzyme experiment need to be chilled before adding the substrate and measuring absorbance?

7) Refer to the data for the acid treated enzyme:
   a) What is the affect of an acidic pH on enzyme structure?
   b) Why does the enzyme not function as effectively following addition of acid?

8) What is the physiological significance of the presence of enzyme in our bodies? From your knowledge of enzymes and reactions explain how you think enzymes allow for the body’s ability to control reactions.