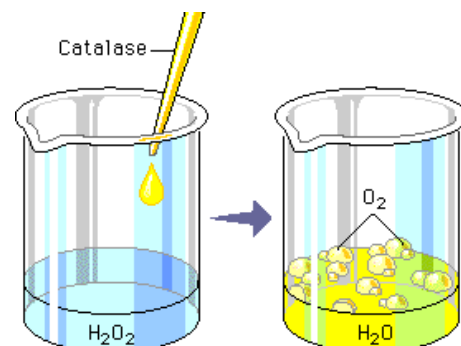


Enzymes: How do temperature and pH affect enzyme function?

Class discussion

- 1) What were some strengths of the way you planned or carried out your investigation? (What made it scientific?)
- 2) What were some weaknesses of the way you planned or carried out your investigation? (What made it less scientific?)
- 3) What rules should we make in order to ensure that our next investigation is scientific?
- 4) Describe the control groups, what they control for, and why they are necessary

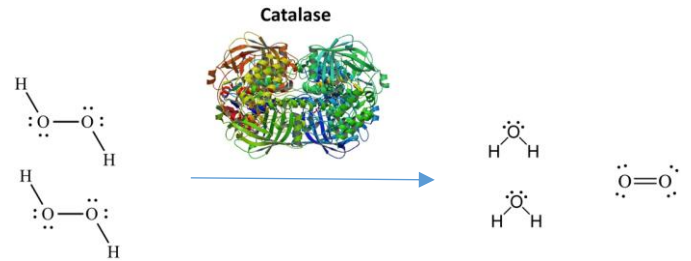
5) Explain what is illustrated



6) How do you know when a chemical change occurs?

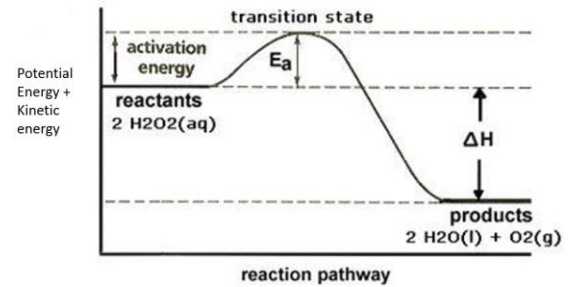
7) How do you know when a physical change occurs?

8) Write down 5 observations

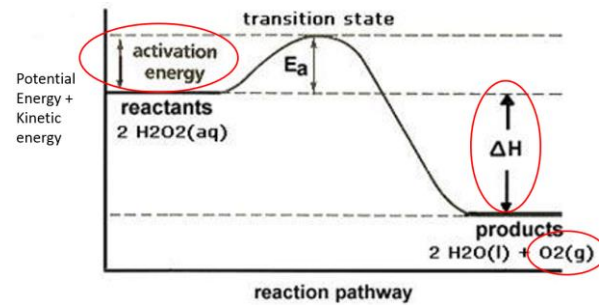


9) Explain what's illustrated

10) Explain what's illustrated

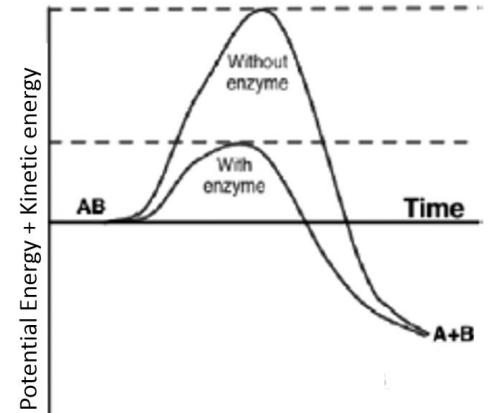


11) What evidence would support the claims made in the circled portions of the illustration?

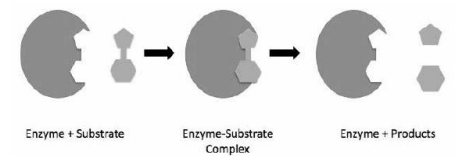


Enzyme effect on chemical reactions

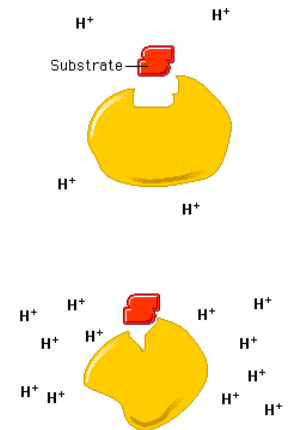
12) Write down 5 observations



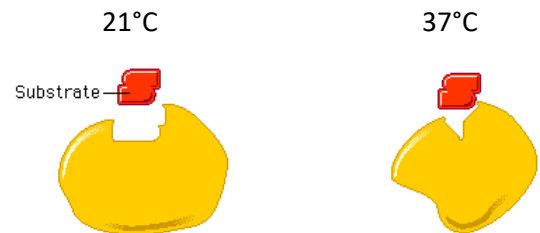
13) Explain what's illustrated



14) Explain what's illustrated



15) Explain what's illustrated



16) Write at least 3 similarities and 3 differences between the 2 graphs

17) What is the dependent variable of each graph?

18) What is the independent variable of each graph?

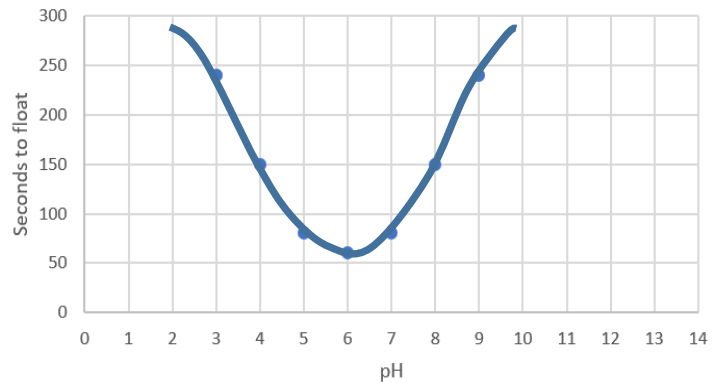
19) Explain how these two apparently inverse graphs are illustrating the exact same data

20) Which graph do you think illustrates the data best and why?

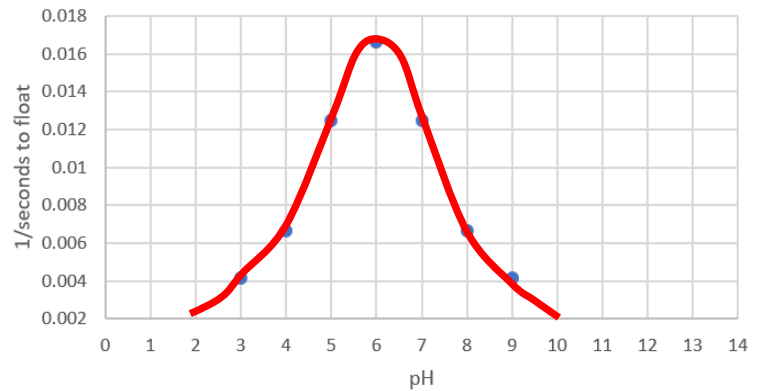
21) What does rate mean?

22) Calculate the rate of oxygen production at 15 seconds

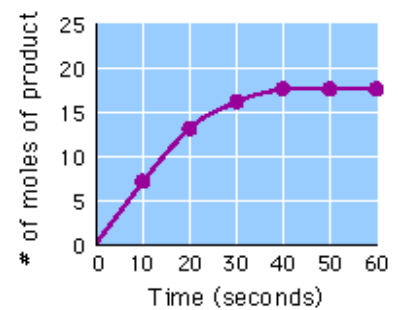
The dependence of enzyme activity on pH



The dependence of enzyme activity on pH



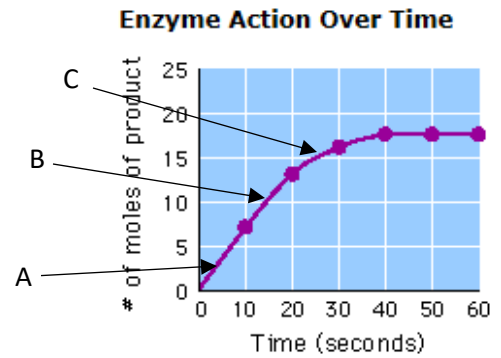
Enzyme Action Over Time



23) Compare the rate of O₂ production at point A to point B:
Is the rate higher, lower, or equal?

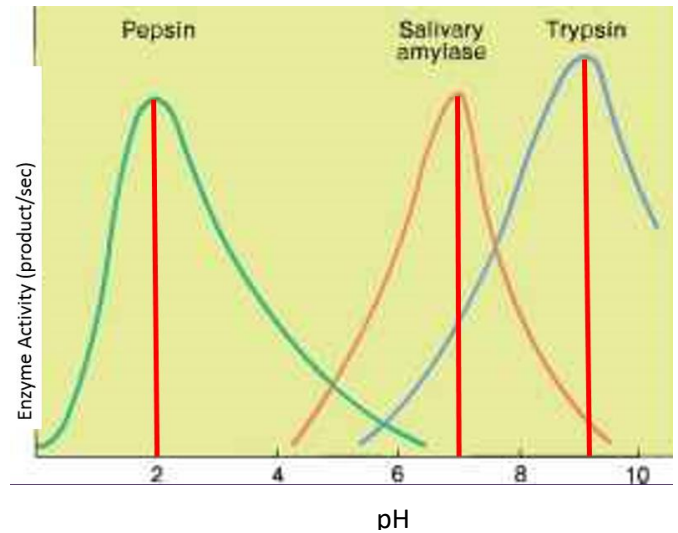
24) Compare the rate of O₂ production at point A to point B:
Is the rate higher, lower, or equal?

25) Calculate the rate of oxygen production at 45 seconds



26) Make 5 observations (pepsin, amylase, and trypsin are all enzymes

27) Explain what's illustrated



28) Where do you think you would find these enzymes in the human body?

29) What do you think the pH set point is in these parts of the body?

30) Describe the enzyme activity of trypsin if it were found in the stomach

31) Justify your answer to the previous question. A justification has 3 components: 1) Scientific knowledge and/or theory; 2) specific data from your analysis related to the knowledge; and 3) an explanation of how the data relates to the knowledge.

32) How was the following demonstrated in this lab?

Cause and effect: Mechanism and Prediction

- Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.
- Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

33) How was the following demonstrated in this lab?

Energy and matter: Flows, Cycles, and Conservation

- Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.
- Energy drives the cycling of matter within and between systems.

34) How was the following demonstrated in this lab?

Structure and Function

- The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.