Honor Bio BioChem : Modern Biology

CHEMISTRY OF LIVING ORGANISMS

1. Carbohydrates, lipids and proteins are all classified as organic compounds.
2. Carbohydrates contain C, H, and O elements.
3. Two monosaccharides may be joined together to form a disacch. and a molecule of H_2O by a process known as dehy synthesis.
4. Two examples of monosaccharides are glucose, and fructose.
5. Two examples of disaccharides include maltose and sucrose.
6. Most carbohydrates end in the letters ose.
7. A major difference between carbohydrates and lipids is in the ratio of H to O.
8. The monomers of lipids include f.a. and glycerol.
9. Three fatty acids and a molecule of glycerol can be put together by dehydration synthesis to make a molecule of triglyceride
10. One important function of lipids is that they are part of a cell structure know as the cell memb.
11. In addition to containing carbon, hydrogen and oxygen, proteins also always contain the element N.
12. The building blocks of proteins are a.a.
13. Two amino acids are joined by a peptide bond.
14. Many amino acids joined together to form a polypeptide.
15. A polypeptide can be broken down by the process known as hydrolysis.
16. enzymes are the organic catalyst of living systems.
17. These organic catalysts can decrease the activation energy needed for a reaction to occur, which in turn makes the reaction go faster.

energy needed for reaction

18. The folding of polypeptide chains forms a pocket into which the reacting molecules fit. This pocket is known as the active site .

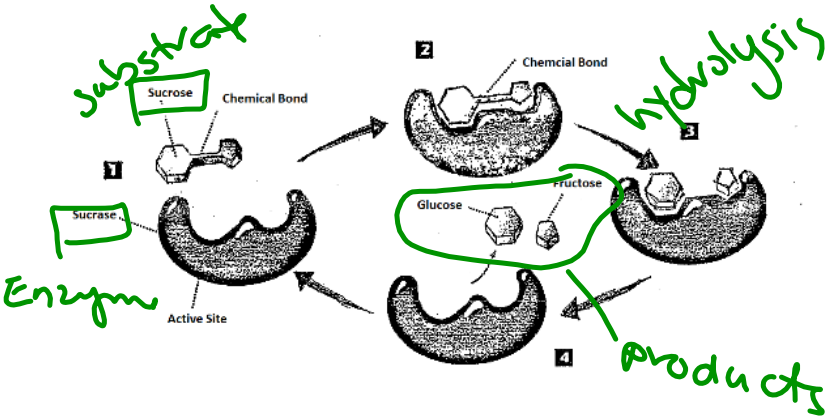
19. The way an enzyme fits with a substrate is called the lock and key model.

Name: _____ ENZYME REACTIONS

1. Identify 2 ways to speed up the rate of a chemical reaction.

add enzyme, energy, ↑ conc., change pH, temp

2. Explain the functions of the substrate and the active site in an enzyme-catalyzed reaction.



3. Which substance in the diagram is the substrate? Explain.

4. At which step does the chemical reaction actually take place? 2-3

5. What chemical reaction is catalyzed by the enzyme?

6. How can you tell from the diagram that sucrase is not used up in the reaction?

Shape Stays Same

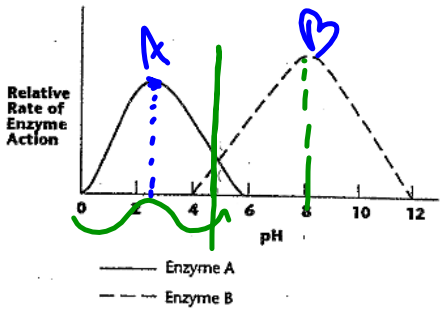
7. Why does a cracker begin to taste sweet after a few minutes of chewing?

Poly → mono

CRITICAL THINKING

protease

A certain experiment was designed to determine the effect of pH on the rate of enzyme action for two protein-digesting enzymes. Enzyme A is found in the stomach. Enzyme B is found in the intestines. Data collected during the experiment are illustrated in the graph.



1. What is the optimum pH for Enzyme A? Enzyme B? ✓

2. Compare the rates of enzyme action at a pH of 5.

3. Based on the data, what can you infer about the relative pH of the stomach? Explain.

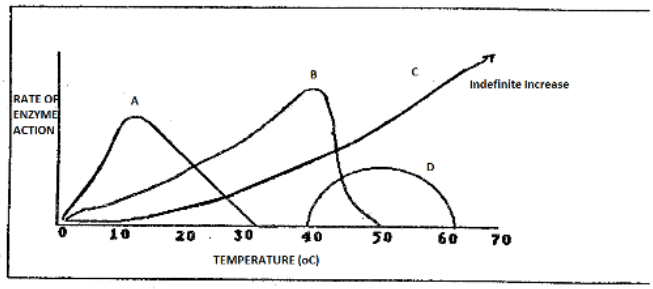
acidic

4. Based on the data, what can you infer about the relative pH of the intestine? Explain.

denatured Basic

5. Suppose a mutation caused the location of the enzymes to be switched. What effect might his have on the digestive process of the organism?

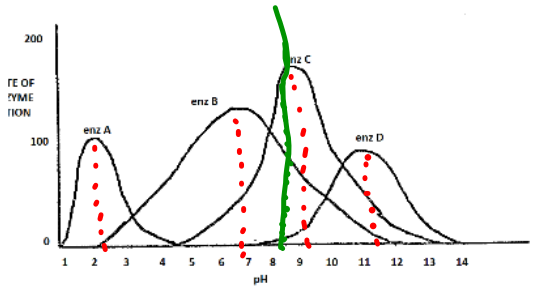
6. Using the temperature graph at right, which of the enzymes shown below (A, B, C or D) is most likely to represent a human enzyme? Why?



B

7. Using the pH graph below, which enzyme would most likely be found in the human stomach?

A



8. Given an animal intestinal pH of 8.5, what can you say about both enzymes B and C? Which is more effective? Use the pH graph at left.

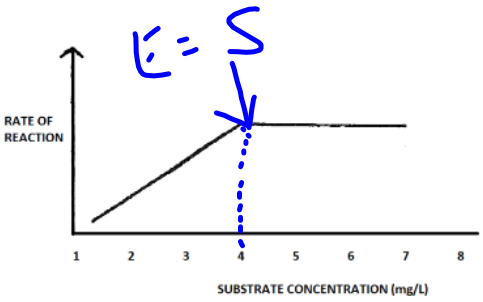
C

9. What information does the graph below tell you about enzyme activity?

once substrates are used up reaction stays same

10. What information does the graph below tell you about the rate of reaction?

rate↑ as subst.↑ until S = E



11. What information does the graph below tell you about enzyme concentration? Substrate concentration?

Enzyme = constant

as subst ↑