

Biology chapter 2 the chemistry of life study

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Do biological catalysts or enzymes act by lowering the required for a reaction?

Enzymes (and other catalysts) act by reducing the activation energy, thereby increasing the rate of reaction. The increased rate is the same in both the forward and reverse directions, since both must pass through the same transition state.

What helps carry out chemical reactions? The answer is enzymes. Enzymes in our bodies are catalysts that speed up reactions by helping to lower the activation energy needed to start a reaction. Each enzyme molecule has a special place called the active site where another molecule, called the substrate, fits.

What macromolecule helps carry out chemical reactions? Enzymes Are Powerful and Highly Specific Catalysts This is the case for the large and very important class of proteins called enzymes. As described in Chapter 2, enzymes are remarkable molecules that determine all the chemical transformations that make and break covalent bonds in cells.

What are special proteins that help change substances during chemical reactions called? An enzyme is a biological catalyst and is almost always a protein. It speeds up the rate of a specific chemical reaction in the cell.

What is the missing word "enzymes are catalysts which _____ the rate of a chemical reaction"? Enzymes are biological catalysts which speed up chemical reactions.

What do enzymes do to catalysts? Enzymes are a form of catalysts that speed up chemical reactions by lowering the activation energy. Catalysts are not consumed in

the reaction.

What are the 3 factors that control chemical reactions?

Can a reaction happen without enzymes? Enzymes bind substrates at key locations in their structure called active sites. They are typically highly specific and only bind certain substrates for certain reactions. Without enzymes, most metabolic reactions would take much longer and would not be fast enough to sustain life.

What determines the specific reaction that an enzyme will catalyze? Thus, the enzymes are very specific for their substrates because the enzyme and the substrate must fit together for the reaction to occur. Therefore, the enzymes are very specific for the reaction that they catalyze and each enzyme controls only one type of chemical reaction.

What is the difference between dehydration synthesis and hydrolysis reactions? Hydrolysis breaks the bonds of polymers by the addition of water. The opposite can also occur, where the monomers are built up to a polymer through the process of dehydration synthesis. Dehydration synthesis is the removal of water to bind monomers together to form a polymer.

What are the reactants called in an enzyme-catalyzed reaction? The reactant in an enzyme-catalyzed reaction is called a substrate. Enzyme inhibitors cause a decrease in the reaction rate of an enzyme-catalyzed reaction.

What is a molecule that results from all dehydration synthesis reactions? In the process a water molecule is formed. As additional monomers join via multiple dehydration synthesis reactions, the chain of repeating monomers begins to form a polymer. Different types of monomers can combine in many configurations, giving rise to a diverse group of macromolecules.

Why do activation energy barriers exist? This is because molecules can only complete the reaction once they have reached the top of the activation energy barrier. The higher the barrier is, the fewer molecules that will have enough energy to make it over at any given moment.

What substances control all the chemical reactions in a cell? The control is exerted through the specialized proteins called enzymes, each of which accelerates,

or catalyzes, just one of the many possible kinds of reactions that a particular molecule might undergo.

What are made of proteins and catalyze chemical reactions? Enzymes are proteins that catalyse chemical reactions – they are biocatalysts. Catalysts make chemical reactions happen much more quickly than is possible spontaneously. Biocatalysts naturally carry out their action in living organisms.

What is the waste product of energy releasing metabolic reactions? The waste product of energy-releasing metabolic reactions is carbon dioxide.

What are two advantages of having enzyme-catalyzed chemical reactions in living cells? Enzymes help with the chemical reactions that keep a person alive and well. For example, they perform a necessary function for metabolism, the process of breaking down food and drink into energy. Enzymes speed up (catalyze) chemical reactions in cells.

Why are chemical reactions that occur during metabolism are affected by temperature? Molecules move and collide This is called collision theory. collisions are more frequent and the likelihood of the molecules having enough energy is greater. Consequently the rate of chemical reactions increases with increasing temperature.

What is meant by the statement "enzymes are biological catalysts"? What is meant by the statement "Enzymes are biological catalysts"? A. Enzymes speed up the chemical reactions in living cells.

What distinguishes enzymes from regular chemical catalysts? The difference between enzyme and catalyst is that enzyme are organic in nature and are natural bio-catalyst where are catalysts are inorganic compounds. Enzymes have high molecular weight whereas catalyst has lower molecular weight.

What are enzymes and why are they called biocatalysts? The enzymes are known as biocatalysts because they speed up biochemical reactions in living organisms. They serve as a catalyst, lowering the activation energy and thus speeding up the reaction. A biocatalyst is an enzyme that speeds up a chemical reaction without altering its equilibrium.

Why do catalysts often come as powder? Catalysts often come as powders, pellets or fine gauzes because these types of substance have particularly high surface areas.

What is the purpose of a catalyst? A catalyst is a substance that speeds up a chemical reaction, or lowers the temperature or pressure needed to start one, without itself being consumed during the reaction. Catalysis is the process of adding a catalyst to facilitate a reaction.

Why does a catalyst cause a reaction to proceed faster? A catalyst increases the rate of reaction by lowering the activation energy. A catalyst increases the rate of reaction in both forward and backward directions by providing an alternate pathway with lower activation energy.

Do catalysts work by lowering a reaction? Catalysts work by lowering the activation energy of a reaction—the amount of energy needed for the reaction to proceed. For example, a catalyst may bring two reactants closer together or may stabilize a transition state.

How do enzymes lower the activation energy of a reaction as biological catalysts? Enzymes perform the critical task of lowering a reaction's activation energy—that is, the amount of energy that must be put in for the reaction to begin. Enzymes work by binding to reactant molecules and holding them in such a way that the chemical bond-breaking and bond-forming processes take place more readily.

What do enzymes catalyze chemical reactions by lowering? Enzymes catalyze chemical reactions by lowering activation energy barriers and converting substrate molecules to products. Enzymes bind with chemical reactants called substrates.

Are enzymes protein catalysts that lower the activation energy of reactions? Enzymes are proteins that act upon substrate molecules and decrease the activation energy necessary for a chemical reaction to occur by stabilizing the transition state. This stabilization speeds up reaction rates and makes them happen at physiologically significant rates.

What does a catalyst speed up a chemical reaction by lowering? Summary. A catalyst is a substance that can be added to a reaction to increase the reaction rate

without getting consumed in the process. Catalysts typically speed up a reaction by reducing the activation energy or changing the reaction mechanism.

Does a catalyst increase or decrease the rate of reaction? A catalyst is a substance that speeds up a chemical reaction, or lowers the temperature or pressure needed to start one, without itself being consumed during the reaction.

How does a catalyst lower the activation energy of a reaction? Catalyst lower activation energy is: By altering the reaction's transition state, a catalyst lowers the activation energy. After that, the reaction follows a different mechanism than the uncatalyzed reaction.

What is the concept of activation energy in the mechanism of enzyme action? The activation energy is the energy required to start a reaction. Enzymes are proteins that bind to a molecule, or substrate, to modify it and lower the energy required to make it react. The rate of reaction is given by the Arrhenius equation. The rate of reaction increases if the activation energy decreases.

How is the activation energy of an enzyme-catalyzed reaction and an uncatalyzed reaction different? Catalyzed reactions are where a catalyst has been introduced into the reaction to speed up its rate by lowering the activation energy, thus introducing a new reaction mechanism. Uncatalyzed reactions don't possess a catalyst, thus their activation energy is greater, and their reaction rate is slower.

What name is given to the reactants in an enzymatically catalyzed reaction? Answer and Explanation: The reactant of an enzyme-catalyzed reaction is called a substrate. A substrate is a molecule acted on by an enzyme to create a product.

How do enzymes speed up chemical reaction by lowering activation energy? Enzymes generally lower activation energy by reducing the energy needed for reactants to come together and react. For example: Enzymes bring reactants together so they don't have to expend energy moving about until they collide at random.

How does feedback regulation regulate enzyme activity? Feedback regulation of an enzyme occurs when a product of the reaction binds to an allosteric site on the enzyme and affects its catalytic activity. Through feedback inhibition, the cell

responds to the amount of reaction product in order to regulate its further production.

Why is the catalytic activity of enzymes essential to ensure? Answer 1 - Catalytic activity of enzyme is essential to ensure and regulate the cellular metabolism, it is because enzymes lowers the activation energy of the reactions that occur in living...

What are the primary factors in the determination of reaction rate in an enzyme-catalyzed reaction? Several factors affect the rate at which enzymatic reactions proceed - temperature, pH, enzyme concentration, substrate concentration, and the presence of any inhibitors or activators.

What is a substance that interferes with the action of a catalyst? An inhibitor can reduce the effectiveness of a catalyst in a catalysed reaction (either a non-biological catalyst or an enzyme).

What are four factors that we looked at that affect the enzyme rate of reaction? Enzyme activity is affected by a number of factors including the concentration of the enzyme, the concentration of the substrate, the temperature, the pH, and the salt concentration.

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