

# Enzymes activity essay sample

[Health & Medicine](#), [Body](#)



## Introduction

Enzymes are proteins which have the ability to facilitate metabolic reactions without being used up in the reaction. The enzyme amylase is responsible for facilitating the hydrolysis of starch to form sugars that are then assimilated by the body. Amylase is an enzyme needed for the digestion of carbohydrates for nutritional purposes. Starch is one of the most important sources of energy in the body. Starch is a polymer made up of several monosaccharide and disaccharide monomers. However, starch cannot be absorbed and used in the body as it is (Cornish-Bowden, 134). Consequently, it has to be digested into smaller units that can be digested easily by the body. This process would proceed at a very low speed under the optimum body conditions and in the absence of amylase (Eisenthal et al., 74). Consequently, enzyme amylase is needed to speed up the process of hydrolysis of starch in order to meet the body's needs in a timely manner. Enzymes are proteins or substances with chemical conformations that resemble proteins and have chains of amino acids connected together. The feature of an enzyme is defined by the arrangement of amino acid in it. Whenever the intermolecular forces of the amino acid are not strong, they might be disintegrated by the prevalent conditions characterized by high temperatures or else the high concentrations of acids (). When such bonds are broken, the enzymes are rendered nonfunctional by the resultant chemical arrangements. The enzymes that participate in the biochemical reactions never undergo permanent transformation and instead remain unaffected till the completion of the specific reaction.

Enzymes are greatly choosy, since they facilitate particular reactions

only. Enzymes possess a portion of a fragment in which it just has the conformation where solitary particular nature of substrate has the ability to bind on to, and such site of activity is referred as the ligand. The molecules which, react before binding to the enzyme is refers to as the substrate. Many enzymes are made up of the protein together with the non-protein portions referred to as the cofactor. The proteins making up the enzymes are normally referred to as the globular proteins. The apoenzyme refers to the part of enzyme with protein characteristics whilst the cofactor incorporates the non-protein part. The holoenzyme is the term referring to both apoenzyme and cofactors.

Amylase breaks down complex polysaccharides into simpler units of monosaccharides such as glucose that are readily used in the body. The enzyme amylase is also involved in complex functions such as the digestion of pus to avoid the abscesses. In addition, it is instrumental as an anti-inflammatory substance as it curbs the reactions caused by release of histamine and other substances of the same nature.

Temperature and pH have significant impacts on the activity of enzyme amylase. Enzyme amylase has recognition sites that identifies glucose and accommodate it as well. This experiment intended to determine the effect of temperature and pH level on the effect of enzyme amylase activity.

## **Properties of Enzymes**

Enzymes are made up of proteins which, are natural catalysts in nature. They lower the activation energy needed for a reaction to take place and hence speed up a particular reaction. Temperature, exceeding a specific range always optimum temperature leads to their break down and leading to

their gradual denaturation. The enzymes perform best at a specific pH known as the optimum proton concentration but are also destroyed by extreme levels of pH both high and low as well. Enzymes have a particular conformation that has two parts with different roles such as the active site and the substrate. The enzymes are not consumed in any reaction and can be used again in subsequent reactions.

## **Functions of Enzymes**

Enzymes form the main constituents in signal transduction and cell control, kinases together with phosphatases assistance in such purpose. Enzymes participate in the transport in association with the protein myosin that assists in contracting the muscles. Enzymes perform a critical function in the digestive action of the enzymes themselves. The amylases are responsible for the breakdown of larger and complex molecules into simpler portions that are readily usable. The enzymes also work in unison to create pathways that are critical for operations in the body.

## **Results**

### Discussion

Low temperatures of about 00C hardly denature enzyme amylase. The low temperatures can impact the activity of enzymes by decreasing the speed of their operations. Enzymes cannot withstand extreme temperatures of about 1000C, a fact that might have attributed to their ability to mutate and withstand the low temperatures but being unable to withstand higher temperatures.

The temperature 220C is the optimal temperature because it operates within

the limits of enzyme requirements. The temperature is directly proportional to the kinetic energy of the molecules towards the activation energy. When temperatures increase towards a favoring condition, the increased number of molecules per unit time will reach the activation energy. More molecular chemical potential energy will then be transformed to kinetic energy and the enzyme activity will be observed to increase.

The other two temperatures resulted into lower activities because at 40C, there was low kinetic energy in the molecules and the rate of collision was lower. Therefore, the temperature led to lower rate of conversion of chemical potential energy into kinetic energy associated with increase in reaction of chemicals.

The lower activity of enzyme exhibited at 370C and 700C attributed to the thermal deactivation and or denaturation. As the increased temperature generate sufficient thermal energy to disintegrate a number of the intramolecular connections between polar groups such as the hydrogen bonding together with the hydrophobic interconnections between the non-polar groups inside the enzyme structure. Whenever such forces are troubled, the secondary together with tertiary stages of the enzyme structure transformed into a random coiled manner that modifies the active site's authorization past its capability to bind the substrate molecule as suggested for catalysis.

## **Conclusion**

The rise in the temperature of a system emanates from the intensification in the kinetic energy of the similar system. Whenever a molecule bumps, the kinetic energy of the molecules is transformed into chemical potential

energy of the atoms. Hence, greater Kinetic Energy of the molecules in a system spontaneously increases the consequential chemical potential energy.

Increasing temperature increases the possibility that more molecules in unit time will attain the activation energy. Hence, rate of the reaction is might increase as well. Changing substrate into a product, demands that the collision and binding of the enzymes the substrate within its active site. Therefore, the rate of reaction increases with the elevation in temperature within the levels.

### **Works Cited**

Cornish-Bowden, Athel. Fundamentals of Enzyme Kinetics. Weinheim: Wiley, 2013. Print.

Eisenthal, Robert, and Michael J. Danson. Enzyme Assays: A Practical Approach. Oxford [England: IRL Press at Oxford University Press, 1992. Print.