Catalytic Activity of Enzymes



Introduction

Enzymes are biological molecules that catalyze (speed up) chemical reactions. You could call enzymes the "Builders and Do-ers" in the cell; without them, life could not occur. Every cell makes hundreds of different enzymes to carry out the reactions necessary for life. Fortunately for the cell, enzymes are not used up when they catalyze a reaction, but can be used over and over.

The DNA in each cell encodes all the information needed to make its many different enzymes. Enzymes are relatively large molecules of protein. They are produced whenever the cell "senses" a need for that particular enzyme; that is, whenever a job needs to be done in the cell which only that enzyme can do it.

The molecule (or molecules) on which an enzyme acts is called its **substrate**. Enzymes are said to be very "specific," meaning that they recognize only one substrate (or a few closely related substrates) and convert it into a specific product. You could say that each enzyme can do only one type of job. Each enzyme is specific because it is folded into a particular three-dimensional shape. Within the folds of each enzyme is the **active site**, the place where the substrate fits and where the chemical reaction takes place.

Enzymes work very quickly, often catalyzing thousands of reactions per minute. The rate at which an enzyme works is influenced by many factors including temperature and pH. Enzymes have a temperature and pH at which they work best, and if an enzyme is exposed to extremes of heat or pH it won't work at all! The interactions that hold the protein in its particular shape become disrupted under these extreme conditions, and the 3-dimensional structure unfolds. In this case, the enzyme is said to be denatured. Other important factors that influence enzyme activity are the concentration of substrate and the concentration of enzyme. Up to a point, the more substrate that is present, the faster the reaction. However, when the substrate concentration is so high that an enzyme is working as fast as it can, further increases of substrate concentration will have no effect on the rate of product formation.

Background

The enzyme that you will study in this experiment is called "catalase." Its job is to break down its substrate hydrogen peroxide (H₂O₂), which is a naturally occurring poison. Without catalase, H₂O₂ could kill the cell. The reaction catalyzed by catalase is:

$$2H_2O_2 \rightarrow 2H_2O + O_2$$

The products remaining after catalase does its job are oxygen gas and water; two very non-poisonous molecules.

Enzyme Catalysis Lab Activity Student Study Guide

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The book delves into Enzyme Catalysis Lab Activity Student Study Guide. Enzyme Catalysis Lab Activity Student Study Guide is a vital topic that needs to be grasped by everyone, from students and scholars to the general public. The book will furnish comprehensive and in-depth insights into Enzyme Catalysis Lab Activity Student Study Guide, encompassing both the fundamentals and more intricate discussions.

- 1. The book is structured into several chapters, namely:
 - Chapter 1: Introduction to Enzyme Catalysis Lab Activity Student Study Guide
 - Chapter 2: Essential Elements of Enzyme Catalysis Lab Activity Student Study Guide
 - o Chapter 3: Enzyme Catalysis Lab Activity Student Study Guide in Everyday Life
 - Chapter 4: Enzyme Catalysis Lab Activity Student Study Guide in Specific Contexts
 - \circ Chapter 5: Conclusion
- 2. In chapter 1, the author will provide an overview of Enzyme Catalysis Lab Activity Student Study Guide. The first chapter will explore what Enzyme Catalysis Lab Activity Student Study Guide is, why Enzyme Catalysis Lab Activity Student Study Guide is vital, and how to effectively learn about Enzyme Catalysis Lab Activity Student Study Guide.
- 3. In chapter 2, this book will delve into the foundational concepts of Enzyme Catalysis Lab Activity Student Study Guide. The second chapter will elucidate the essential principles that need to be understood to grasp Enzyme Catalysis Lab Activity Student Study Guide in its entirety.
- 4. In chapter 3, the author will examine the practical applications of Enzyme Catalysis Lab Activity Student Study Guide in daily life. The third chapter will showcase real-world examples of how Enzyme Catalysis Lab Activity Student Study Guide can be effectively utilized in everyday scenarios.
- 5. In chapter 4, the author will scrutinize the relevance of Enzyme Catalysis Lab Activity Student Study Guide in specific contexts. This chapter will explore how Enzyme Catalysis Lab Activity Student Study Guide is applied in specialized fields, such as education, business, and technology.
- 6. In chapter 5, the author will draw a conclusion about Enzyme Catalysis Lab Activity Student Study Guide. The final chapter will summarize the key points that have been discussed throughout the book.
 - The book is crafted in an easy-to-understand language and is complemented by engaging illustrations. This book is highly recommended for anyone seeking to gain a comprehensive understanding of Enzyme Catalysis Lab Activity Student Study Guide.

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