

## Chapter 6 – Enzymes

### 6.1 An Introduction to Enzymes

The following sub-sections are important:

- The Introduction
- Most Enzymes are Proteins
- Enzymes are Classified by the Reactions They Catalyzed

### 6.2 How Enzymes Work

The following sub-sections are important:

- The Introduction
- Enzymes Affect Reaction Rates, Not Equilibria
- Reaction Rates and Equilibria Have Precise Thermodynamic Definitions
- A Few Principles Explain the Catalytic Power and Specificity of Enzymes
- Weak Interactions Between Enzyme and Substrate Are Optimized in the Transition State
- Binding Energy Contributes to Reaction Specificity and Catalysis

### 6.3 Enzyme Kinetics as an Approach to Understanding Mechanism

The following sub-sections are important:

- The Introduction
- Substrate Concentrations Affect the Rate of Enzyme-Catalyzed Reactions
- The Relationship Between Substrate Concentration and Reaction Rate can be Expressed Quantitatively
- Kinetic Parameters are Used to Compare Enzyme Activities
- Many Enzymes Catalyze Reactions with Two or More Substrates
- Enzyme Activity Depends on pH
- Pre-Steady State Kinetics Can Provide Evidence for Specific Reaction Steps
- Enzymes are Subject to Reversible or Irreversible Inhibition

### 6.4 Examples of Enzymatic Reactions

- This section has way more detail than you are expected to know. All you need to know are the 6 classes of enzymes that are in the slides and the types of reactions they catalyze.

### 6.5 Regulatory Enzymes

The following sub-sections are important:

- The Introduction
- Allosteric Enzymes Undergo Conformational Changes in Response to Modulator Binding
- The Kinetic Properties of Allosteric Enzymes Diverge from Michaelis-Menten Behavior
- Some Enzymes Are Regulated by Reversible Covalent Modifications
- Phosphoryl Groups Affect the Structure and Catalytic Activity of Enzymes
- Multiple Phosphorylation Allow Exquisite Regulatory Control