

## Topic 4. Enzyme properties. Effect of activators and inhibitors. Determination of enzyme activity.

### *Theoretical questions:*

1. Enzymes as biological catalysts.
2. Specificity of enzymes. Types of substrate specificity.
3. Factors that affect the rate of enzymatic reactions:
  - 3.1. Temperature;
  - 3.2. pH medium;
  - 3.3. Amount of substrate; definition of Michaelis constant
4. Enzyme inhibition. What substances are called inhibitors? The main types of inhibition: reversible and irreversible, competitive and non-competitive inhibition. Examples of inhibitors that are used in clinics.
5. Determination of enzyme activity. Units of enzyme activity (international, specific, molecular, clinical units) and their significance.

### Study Questions and Tasks

**1. Enzymes as Biological Catalysts.** Write down the main characteristics.

- 1). \_\_\_\_\_  
\_\_\_\_\_
- 2). \_\_\_\_\_  
\_\_\_\_\_
- 3). \_\_\_\_\_  
\_\_\_\_\_
- 4). \_\_\_\_\_  
\_\_\_\_\_
- 5). \_\_\_\_\_  
\_\_\_\_\_
- 6). \_\_\_\_\_  
\_\_\_\_\_

**2. Types of substrate specificity of enzymes.** Give the names and definitions.

- 1). \_\_\_\_\_  
\_\_\_\_\_
- 2). \_\_\_\_\_  
\_\_\_\_\_
- 3). \_\_\_\_\_  
\_\_\_\_\_

**3. Factors that affect the rate of enzymatic reactions. Draw “rate of enzymatic reactions – factor” curves**

1) Temperature

2) pH medium

3) Concentration of substrate

Definition of Michaelis constant

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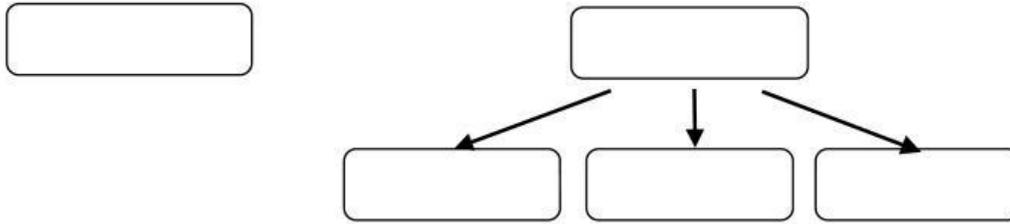
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Draw “rate – substrate concentration” curve and show Michaelis constant

**4. Main types of enzyme inhibition.**



**5. Units of enzyme activity.**

Enzyme Unit \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

International \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Specific \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Molecular \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Clinical \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Text-books:**

1. Biochemistry 5th Edition Ch.5, pp.53-68.
2. Prasad textbook of biochemistry OCR. Topic 7. pp. 117-149.