

14.3 Factors Affecting Rate of Enzyme Action

FACTORS AFFECTING RATE OF ENZYME ACTION

$$pH = -\log [H^+]$$

pH change $\begin{cases} \text{Slight} \rightarrow \text{Ionization} \\ \text{Extreme} \rightarrow \text{Denaturation} \end{cases}$

	Optimum pH
✓ Pepsin (1.5-1.6)	<u>2.0</u>
Sucrase + Invertase	<u>4.5</u>
Enterokinase	5.5
Salivary Amylase	6.8
Catalase	<u>7.0</u> (KPK)
Chymotrypsin	7-8
Pancreatic Lipase (7.4-7.8) BTB	<u>9.0</u>
Arginase	<u>9.7</u>

✓ Trypsin	7.8-8.7
✓ Maltase	6.1-6.8
Urease	7.0

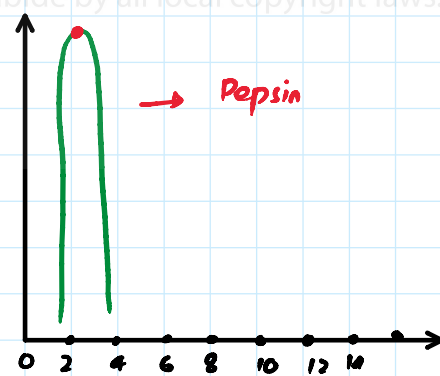
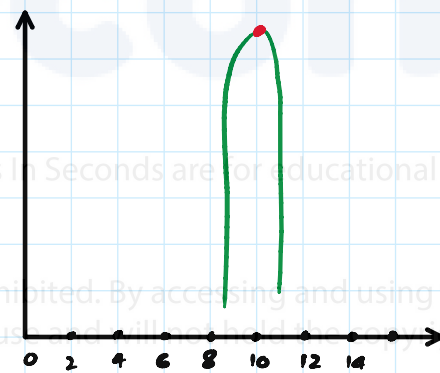
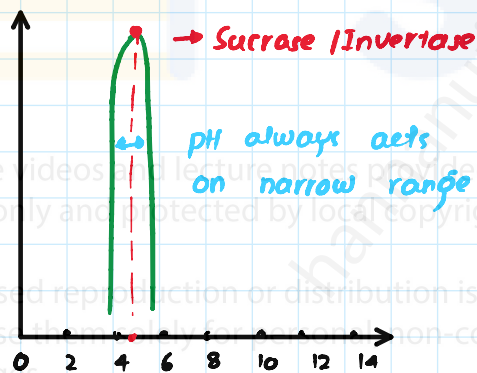
Optimum pOH

ACIDIC	12.0
	9.5
	8.5
	7.2
X	
BASIC	6.4
	6-7
	5.0
	4.3

For KPK

• Lipase	Pancreatic → 8.0
	Stomach → 4.5
	Castor Oil → 4.7

• Amylase	Pancreatic → 6.7-7.0
	Malt → 4.6-5.2



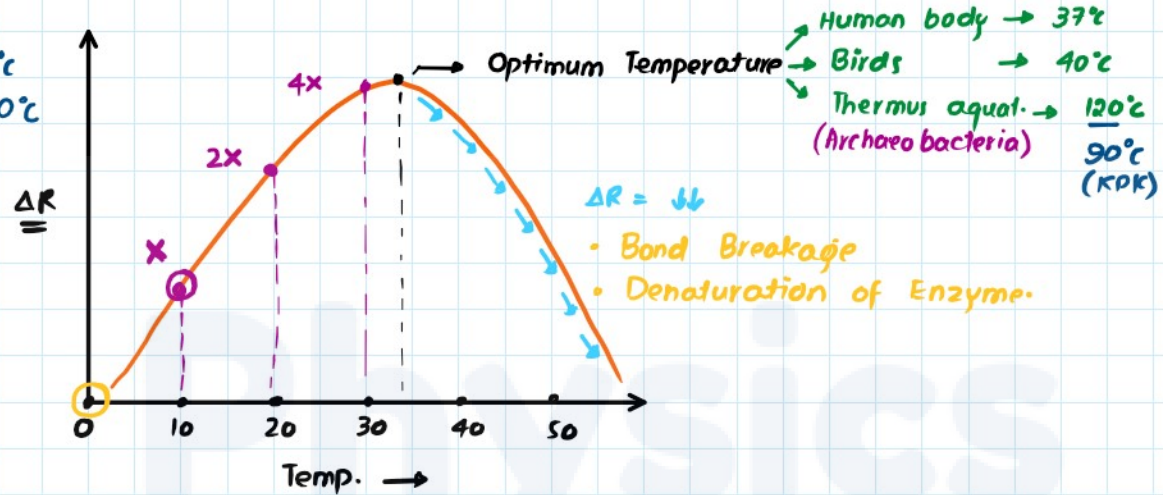
TEMPERATURE

$$\propto K \cdot E \left(\frac{1}{2} m v^2 \right)$$

$$K \cdot E \propto \text{Collision} \propto \Delta R$$

KPK

- Mammals $\rightarrow 40^\circ\text{C}$
- Arctic Snow Flea $\rightarrow -10^\circ\text{C}$

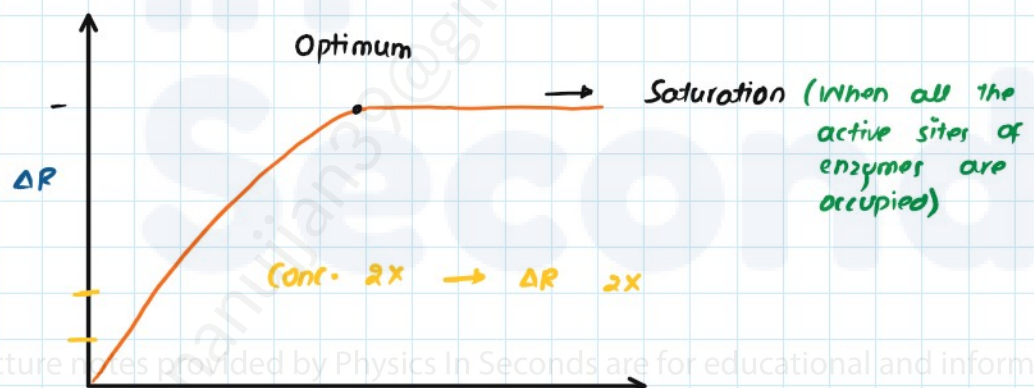


LOWER TEMP.

(Enzyme Inactivity)

CONCENTRATION

• SUBSTRATE, ENZYME



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