Topic: Enzyme(Nomenclature & Classification)

Class: B.Sc Part –III (Hons.)

Paper- V

Group – A

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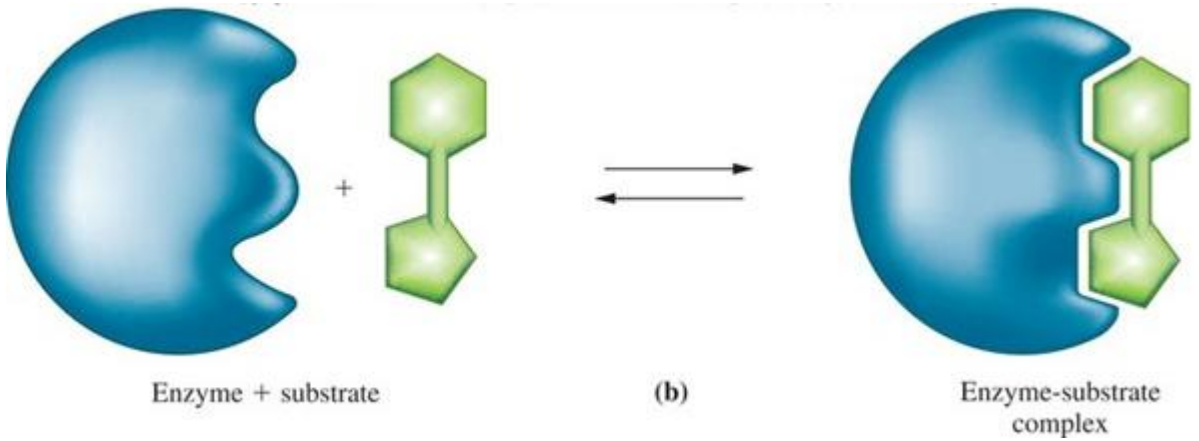
Induced Fit Enzyme Model



- The induced-fit model of enzyme action assumes that the enzyme active site is more a flexible pocket whose conformation changes to accommodate the substrate molecule

Classes of Enzyme Specificity

- Absolute: enzyme reacts with only one substrate
- Group: enzyme catalyzes reaction involving any molecules with the same functional group
- Linkage: enzyme catalyzes the formation or break up of only certain category or type of bond
- Stereochemical: enzyme recognizes only one of two enantiomers

Cofactors and Coenzymes

- Active enzyme / Holoenzyme:

-Polypeptide portion of enzyme (apoenzyme)

-Nonprotein prosthetic group (cofactor)

- Cofactors are bound to the enzyme for it to maintain the correct configuration of the active site

-Organometallic compounds

-Metal ions

-Organic compounds

Water-Soluble Vitamins and Their Coenzymes

Vitamin	Coenzyme	Function
Thiamine (B_1)	Thiamine pyrophosphate	Decarboxylation reactions
Riboflavin (B_2)	Flavin mononucleotide (FMN)	Carrier of H atoms
	Flavin adenine dinucleotide (FAD)	
Niacin (B_3)	Nicotinamide adenine dinucleotide (NAD^+)	Carrier of hydride ions
	Nicotinamide adenine dinucleotide phosphate ($NADP^+$)	
Pyridoxine (B_6)	Pyridoxal phosphate	Carriers of amino and carboxyl groups
	Pyridoxamine phosphate	
Cyanocobalamin (B_{12})	Deoxyadenosyl cobalamin	Coenzyme in amino acid metabolism
Folic acid	Tetrahydrofolic acid	Coenzyme for 1-C transfer
Pantothenic acid	Coenzyme A	Acyl group carrier
Biotin	Biocytin	Coenzyme in CO_2 fixation
Ascorbic acid	Unknown	Hydroxylation of proline and lysine in collagen

NAD+ to NADH Mechanism

- The nicotinamide part of NAD+ accepts a hydride ion (H plus two electrons) from the alcohol to be oxidized

- The alcohol loses a proton (H+) to the solvent

Oxidized form Reduced form