

Technical Tuesday

REF:TT/ March 2014/ WK 2

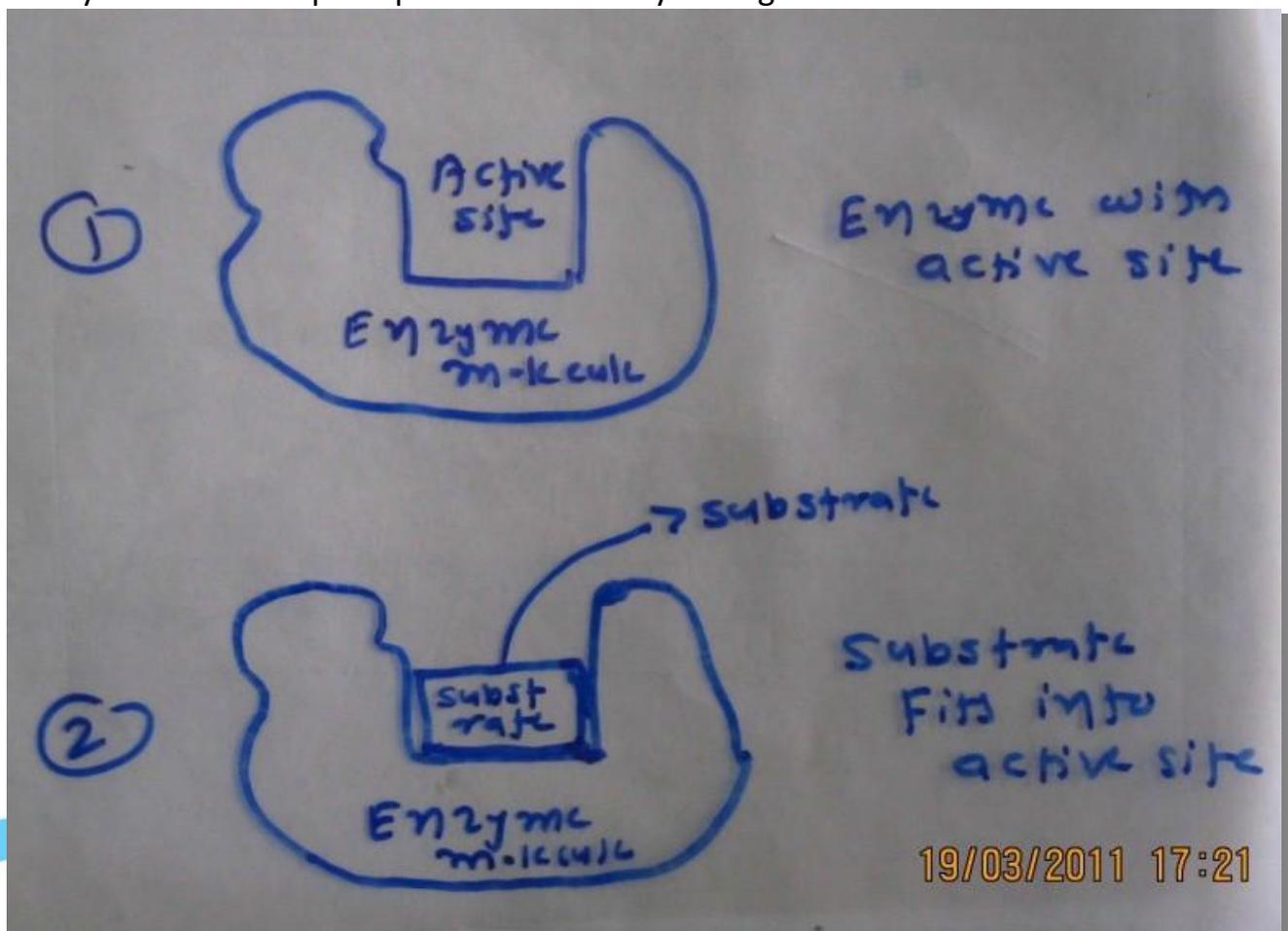
CONCEPT OF ENZYMES

Enzymes are high molecular weight protein secreted by living organisms capable of Catalyzing the chemical reactions of biological process.

The protein complex is composed of 200-250 amino acids.

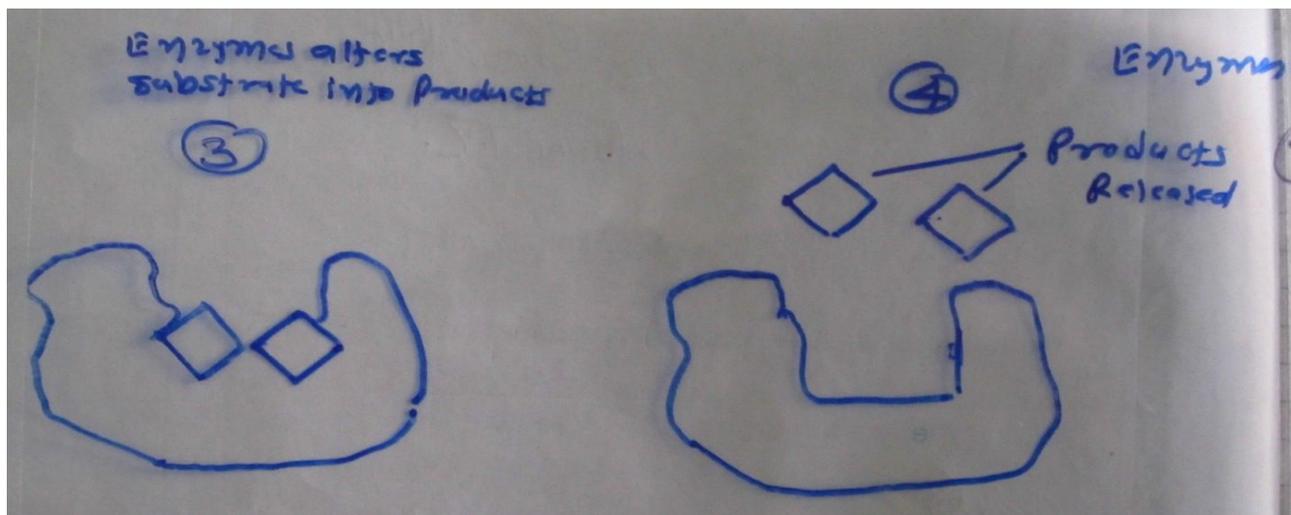
Properties of Enzyme:

- All enzymes are proteins and are water soluble.
- Each enzyme has specific catalytic action.
- They work at specific temperature/pH.
- Abnormal conditions reduce their activity.
- Their molecules are round in shape.
- They have pockets shaped gap-called active site.
- They function with principal of lock and key arrangement



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The mechanism of working of enzymes:

- Substrate fits exactly into active site (fig2).
- Enzymes join with substrate for short while.
- Enzymes alter substrate into products and products are released (fig3/4).
- Enzymes are not used in the process and continue action if more substrate is provided.



Factors affecting efficiency of enzymes:

1) Temperature:

- Enzymes work at particular temperature. Changes in temperature alter their efficiency. Most of enzymes work at 40-60 degree Centigrade
- Above optimum temperature, heat alters the shape of enzyme molecule, Changing the shape of active site. This leads to reduction in their activity.

2) pH:

- Some enzymes work best in alkaline medium, while some work best in acidic medium for every enzyme there is optimum pH where its activity is highest.

3) Concentration of Enzymes:

- Increase in concentration of enzymes increases the reaction rate.

4) Concentration of substrate:

- Increase in concentration of substrate increases the reaction rate till certain point.

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5) Concentration of products:

- Accumulation of products decreases the enzyme activity.

6) Radiations:

- Exposure to UV rays, X rays reduce their reactivity.

Classification of Enzymes:

a) Oxido Reductases:

These enzymes catalyze oxidation-reduction reactions involving transfer of atom or electrons.

b) Transferases:

These enzymes transfer C,N,P or S containing groups from one substrate to another.

c) Hydrolases:

These enzymes catalyse cleavage reaction by hydrolysis.

d) Lyases:

They nonhydrolically remove group from the substrate with formation of double bond or add new groups across double bond to convert it into single bond.

e) Isomerases:

These enzymes catalyses intermolecular rearrangements to form an isomer. (Isomer –Same molecular formation but different structural formula)

f) Ligases:

These split C-C, C-O, C-N, C-S or C-halogen bonds without hydrolysis or oxidation

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