

The reaction selectivity of zeolite depends upon the size of cavities, pores and distribution of pores in structure. Pore size in zeolite varies from 260 pm to 740 pm.

Enzyme Catalyst

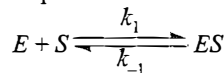
- Enzymes are complex nitrogenous organic compounds which are produced by living plants and animals. They are high molecular mass protein molecules. Enzymes form colloidal solutions in water and are very effective catalysts. They catalyse numerous biochemical reactions. The enzymes are thus, termed as biochemical catalysts and the phenomenon is known as biochemical catalysis.

Mechanism of Enzyme Catalyst

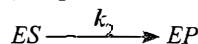
- There are a number of cavities present on the surface of colloidal particles of enzymes. These cavities are of characteristic shape and possess active groups such as —NH₂, —COOH, —SH, —OH, etc. These are actually the active centres on the surface of enzyme particles. The molecules of the reactant (substrate), which have complementary shape, fit into these cavities just like a key fits into a lock. On account of the presence of active groups, an activated complex is formed which then decomposes to yield the products.

Michaelis and Menten suggested the following mechanism for enzyme catalysis.

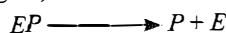
Step 1 : Binding of enzyme to substrate to form an activated complex.



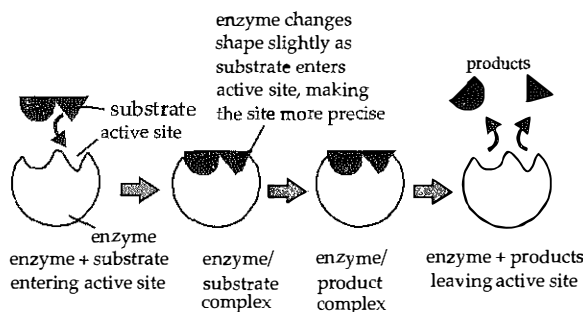
Step 2 : Product formation in the activated complex,



Step 3 : Decomposition of EP into products and enzyme again,



This mechanism accounts for the high specificity of enzymatic reactions.



	Enzyme	Source	Enzymatic reaction
1.	Invertase	Yeast	Sucrose → glucose and fructose
2.	Zymase	Yeast	Glucose → ethyl alcohol and carbon dioxide
3.	Diastase	Malt	Starch → maltose
4.	Maltase	Yeast	Maltose → glucose
5.	Urease	Soyabean	Urea → ammonia and carbon dioxide

COLLOIDAL STATE

- The colloid is not a substance but it is a state of matter like solid, liquid and gas. Colloidal system is a two-phase system.
- Dispersed phase** is a discontinuous phase which is a cluster of particles within the colloidal range suspended in a **dispersion medium**.
- Types of solutions :** Depending on the size of the dispersed phase, solutions are divided into three classes.
 - True solutions (Molecular solutions)
 - Colloidal solutions (Colloidal dispersion)
 - Suspension (Coarse dispersion)

Distinctive characteristics of true solutions, colloidal solutions and suspensions

Properties	True solutions	Colloidal solutions	Suspensions
Size	< 1 nm	1 nm - 100 nm	> 100 nm
Visibility	Invisible even under ultra-microscope	Visible only under ultra-microscope	Visible even by naked eyes
Diffusion	Diffuse rapidly	Diffuse slowly	Do not diffuse
Filtration - with filter paper - with membrane	Not possible Not possible	Not possible Possible	Possible Possible
Scattering of light Tyndall effect	No scattering	Takes place (Tyndall effect)	Do not show Tyndall effect