

## Factors affecting Reaction rate.

The rate of a chemical reaction depends on the rate of encounter between the molecules of the reactants which in turn depends on the following things.

(1) **Effect of temperature on reaction rate:** The rate of chemical reaction generally increases on increasing the temperature.

(2) **Nature of reactants:**

(i) Reactions involving polar and ionic substances including the proton transfer reactions are usually very fast. On the other hand, the reaction in which bonds are rearranged, or electrons transferred are slow.

(ii) Oxidation-reduction reactions, which involve transfer of electrons, are also slow as compared to the ionic substance.

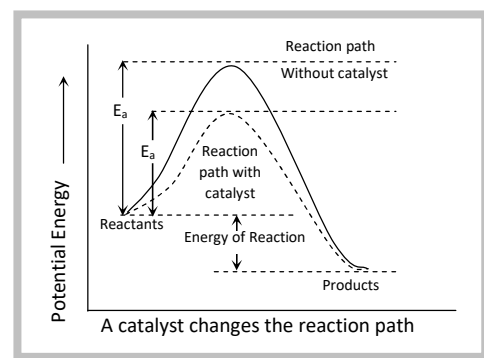
(iii) Substitution reactions are relatively much slower.

(3) **pH of the medium:** The rate of a reaction taking place in aqueous solution often depends upon the  $H^+$  ion concentration. Some reactions become fast on increasing the  $H^+$  ion concentration while some become slow.

(4) **Concentration of reactants:** The rate of a chemical reaction is directly proportional to the concentration of the reactants means rate of reaction decreases with decrease in concentration.

(5) **Surface area of reactant:** Larger the surface area of reactant, the probability of collisions on the surface of the reactant particles by the surrounding molecules increases and thus rate of reaction increases.

(6) **Presence of catalyst:** The function of a catalyst is to lower down the activation energy. The greater the decrease in the activation energy caused by the catalyst, higher will be the reaction rate. In the presence of a catalyst, the reaction follows a path of lower activation energy. Under this condition, a large number of reacting molecules are able to cross over the energy barrier and thus the rate of reaction increases. Fig. shows how the activation energy is lowered in presence of a catalyst.



(7) **Effect of sunlight:** There are many chemical reactions whose rate are influenced by radiations particularly by ultraviolet and visible light. Such reactions are called photochemical reactions. For example, Photosynthesis, Photography, Blue printing, photochemical synthesis of compounds etc.

$H_2 + Cl_2 \xrightarrow{\text{sunlight } (h\nu)} 2HCl$  : The radiant energy initiates the chemical reaction by supplying the necessary activation energy required for the reaction.