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Topic :- CATALYTIC Reactions.

Catalytic reaction are broadly Classified into two classes.

(a) Homogeneous Catalytic Reactions.

(b) Heterogeneous Catalytic Reaction

Homogeneous Catalytic Reaction

Those Chemical reactions in which both reactants and Catalyst are in same phase are Called Homogeneous Catalytic reactions.

oxidation of sulphur dioxide ($SO_2$) with $O_2$ in presence of $NO$ (Nitric oxide) is an example of HOMOGENEOUS Catalytic Reactions.

$$2SO_2 + O_2 \xrightarrow[\text{Gas.}]{NO} 2SO_3$$

In the above example both reactants

$SO_2$, $O_2$ as well as Catalyst NO are in same phase, therefore it is Homogeneous Catalytic reaction.

other examples of Homogeneous Catalytic reaction are

$$\underset{\text{Sucrose Solution}}{C_{12}H_{22}O_{11}} + H_2O \xrightarrow{HCl} \underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Fructose}}{C_6H_{12}O_6}$$

The above reaction is also an example of Homogeneous Catalytic reaction. because both reactants and Catalyst are in same liquid phase.

As far as Mechanism followed during Homogeneous Catalytic reaction is theory of intermediate Compound formation

This theory is explained as.

$$2SO_2 + O_2 \xrightarrow{NO} 2SO_3$$

The above reaction follows following path.

$$2NO + O_2 \rightarrow 2NO_2$$

$$NO_2 + SO_2 \rightarrow SO_3 + NO$$

Thus we see that NO Catalyst Changes into $NO_2$ on oxidation which is an Intermediate. This intermediate finally oxidises $SO_2$ into $SO_3$. This theory is proposed for HOMOGENEOUS CATALYTIC REACTIONS.