M.Sc. I Sem.
CC-2, Unit-IV

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Concept of activity :-

According to Law of mass action, "The rate of reaction is proportional to the product of active masses of the reactants. In case of gases, partial pressures can be used in place of active masses as the two are proportional to each other. But when substances react in solution, it does not necessarily follow that their concentrations correspond entirely to their active masses. This would occur only if the solution are ideal i.e dilute solution, e.g. one component becomes hydrated or solvated and if only the non-solvated portion can react then it is only this portion that contributes to the active mass.

If the total concentration be c and that of the non solvated molecules be a then the ratio a/c is termed as activity coefficient usually repersented by f or γ, so

$$\frac{a}{c} = f \text{ or } \gamma \quad \text{——— (I)}$$

The same idea, has been applied to solution of strong electrolytes. In case of an ideal solution, the value of f is unity.

consider the following reaction to take place in solution.

$$A + B \rightleftharpoons C + D$$

At equilibrium.

$$K = \frac{a_C \times a_D}{a_A \times a_B}$$