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Class ⇒ B.Sc.(Part-I) Subsidiary
Subject ⇒ Chemistry
Chapter ⇒ Ionic Equilibrium
Topic ⇒ Common ion effect

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Common ion Effect

The suppression of the dissociation of a weak acid or a weak base on the addition of its own ion is called common ion effect.

When a soluble salt (A^+C^-) is added to a solution of another salt (A^+B^-) containing a common ion (A^+), the dissociation of AB is suppressed.

$$AB \rightleftharpoons A^+ + B^-$$

By the addition of the salt (AC), the concentration of A^+ increases. Therefore, according to Le chatelier's principle, the equilibrium will shift to the left, thereby decreasing the concentration of A^+ ions or that, the degree of dissociation of AB will be reduced.

e.g.

(i) The addition of sodium acetate to a solution of acetic acid suppresses the dissociation of acetic acid, represented by the equilibrium.

$$CH_3COOH \rightleftharpoons H^+ + CH_3COO^-$$

The addition of one of the products of dissociation (e.g. acetate ion) supplied by the largely dissociated salt (e.g. Sodium acetate) pushes the equilibrium to the left. In other words, the dissociation of acetic acid is suppressed.

(ii) The dissociation of weak base such as ammonium hydroxide, represented by the equilibrium.

$$NH_4OH \rightleftharpoons NH_4^+ + OH^-$$

is suppressed on the addition of a salt like ammonium chloride which supplies ammonium ions. The addition of a strong base like sodium hydroxide which supplies hydroxyl ion, also suppresses the dissociation of ammonium hydroxide.

(iii) In a saturated solution of silver chloride, we have the equilibrium

$$AgCl \rightleftharpoons Ag^+ + Cl^-$$

When sodium chloride is added to the solution the concentration of Cl^- ions will increase. The equilibrium will be shifted to the left to form more of solid AgCl. Thus the solubility of AgCl will decreases.

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