

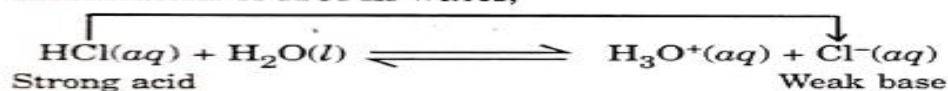
CHEMISTRY (BSC -105)

Acid-Base Concept

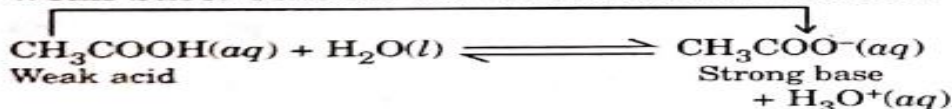
Q1: Discuss relative strengths of conjugate acids and bases.

Relative Strengths of Conjugate Acids and Bases

According to Bronsted-Lowry concept, the strength of an acid depends upon its tendency to donate a proton and the strength of a base depends upon its tendency to accept a proton. According to this, a strong acid means a good proton donor and a strong base means a good proton acceptor. For example, consider the dissociation of HCl in water,

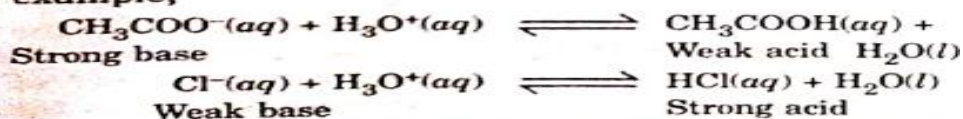


HCl has a strong tendency to donate a proton, therefore, it is a strong acid. But Cl^- ion has very little tendency to accept a proton, therefore, Cl^- ion is a weak base. Thus, the equilibrium lies towards right hand side. Thus, **conjugate base of a strong acid is a weak base**. Consider the dissociation of acetic acid.



Now, acetic acid is a weak acid and the equilibrium lies towards left. This also indicates that CH_3COO^- ion has greater tendency to accept the proton and therefore, is a strong base.

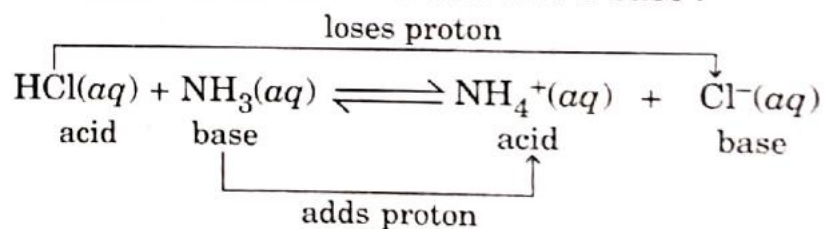
Similarly, the strong base has a weak conjugate acid and a weak base has a strong conjugate acid. For example,



Q3: Select any one example to define Conjugate acid-base pair.

Conjugate Acid-Base Pairs

Consider a reaction of an acid and a base :



It is clear that HCl donates a proton (*acts as an acid*) and forms Cl^- ion which has a tendency to accept a proton (can act as a base). Similarly, NH_3 accepts a proton and acts as a base but it forms NH_4^+ ion which has a tendency to behave as an acid. In other words, an acid donates a proton and becomes a base and a base accepts a proton and becomes an acid.

The base formed from an acid is referred to as the **conjugate base of the acid**. Similarly, the acid formed from a base is called the **conjugate acid of the base**. Thus, in the above example, Cl^- is the conjugate base of acid HCl and NH_4^+ is the conjugate acid of the base NH_3 .