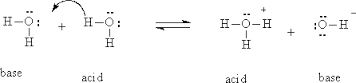
**Dissociation of Water**

**One of the most important properties of water is its ability to act as both an acid and a base.**

**In the presence of an acid, water acts as a base, whereas in the presence of a base water acts as an acid.**

**When water is pure, one molecule can donate a proton to another in a reaction in which water acts as both an acid and a base in the same reaction.**

**Example:**



**Called the dissociation of water, this reaction is characterized by the equilibrium equation:**

**Kw = [H3O+] [OH-]**

**Kw = ion product constant of water.**

**Dissociation of water:**

**2H2O H3O+ (aq) + OH- (aq)**

**The concentration of water is omitted from the equilibrium constant expression because water is a pure liquid.**

**There are 2 important parts to the dissociation of water:**

1. **The forward and reverse reactions are rapid, H2O, H3O+ ions and OH- ions continually convert as protons transfer quickly from one species to another.**
2. **The positions of the equilibrium lies far to the left:**

**At any given instant, only a fraction of the water molecules are dissociated int H3O+ and OH- ions. Most of the H2O molecules are not dissociated.**