

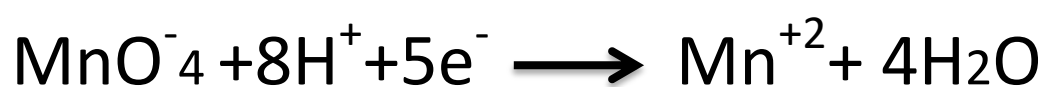
Oxidation –Reduction Titrations

Preparation and Standardization of 0.1N KMnO₄ Solution

Aim: To determine the concentration Normality of Potassium Permanganate (KMnO₄) solution by titrating is against a 0.1N standard solution of oxalic acid (H₂C₂O₄) .

Titration of Potassium Permanganate with Oxalic Acid is a type of redox titration .

KMnO₄ is an oxidizing agent which works in acidic medium more strongly than alkaline medium .Its oxidizing action can be represented by following reaction in an acidic medium



In acidic medium ,the equivalent weight of Permanganate is equal to 1/5 of its molecular weight,that is KMnO₄ accepted 5 electrons.

$$\text{Equivalent Weight of Permanganate} = \frac{158.03}{5} = 31.61 \text{ gm}$$

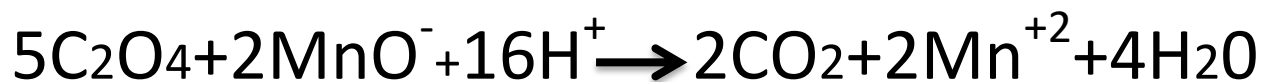
We use sulphuric acid (H_2SO_4) in this titration with KMnO_4 . The solution which contains MnO_4^- ion in it is purple in color. While the solution containing Mn^{+2} ions is pink. Thus, Potassium Permanganate when reacts with a reducing agent it works as self indicator also.

In this experiment, Oxalic Acid acts as a reducing agent and KMnO_4 is taken in an acidic medium of H_2SO_4 . So, there is no need of indicator as Potassium Permanganate will act as self-indicator.

Oxidation Half reaction:



By multiplying the oxidation equation for oxalic acid by 5 and the equation for permanganate reduction by 2 and adding the two equations:



Overall Reaction:



This titration cannot be carried in the presence of acids like nitric acid or HCl because itself is an oxidising agent.

$$N \times V = N \times V$$

