

## Laboratory Manual

- 1) Permanganometry is the titrimetric analysis using a standard solution of potassium permanganate as the titrant.  $KMnO_4$  is a strong oxidant. The pink color of very slight excess of  $KMnO_4$  imparts a pink color to the titrated solution. This makes possible the detection of end point and thus  $KMnO_4$  acts as a self-indicator.

$KMnO_4$  is not a primary standard substance. So, it needs to be standardized against oxalic acid. Today the procedure of standardization of  $KMnO_4$  by titration with oxalic acid will be demonstrated-

### Standardization of $KMnO_4$ with standard oxalic acid solution

25 ml of (N/20) standard oxalic acid solution was taken in a 250 ml conical flask, 25 ml 4(N)  $H_2SO_4$  was added and heated to 70-80°C and titrated with  $KMnO_4$  solution until the solution turns light pink that is stable for about 30 seconds. Two readings were taken and the average value was used for calculation of strength of  $KMnO_4$  solution.

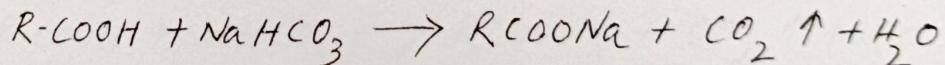
Calculation:

$$V_1S_1 = V_2S_2$$

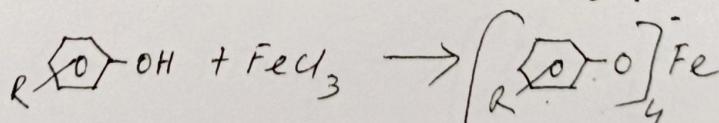
### 2) Functional Group Detection:

Functional groups assign the chemical properties to an organic compound like carboxylic acid, phenolic-OH, carbonyl, amine, nitro group etc. Detection of a few functional groups will be demonstrated today-

- Carboxylic acid (-COOH): To ethanolic solution of a pinch of sample, 1 drop of saturated  $NaHCO_3$  is added. Effervescence is observed which confirms presence of -COOH functional group.



- Phenolic-OH: To ethanolic solution of sample, one drop of neutral  $FeCl_3$  is added. Color change confirms presence of Phenolic-OH functional group.



- Carbonyl group: To ethanolic solution of the sample, 2 drops of 2,4-DNP solution was used. Appearance of reddish-orange precipitate, confirms presence of carbonyl functional group.

