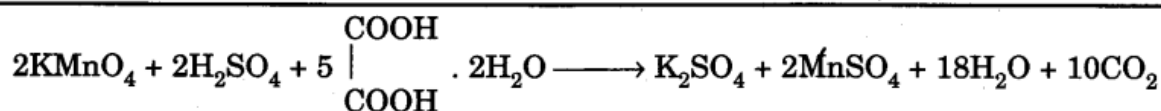
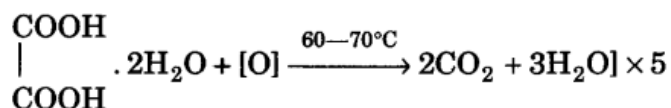
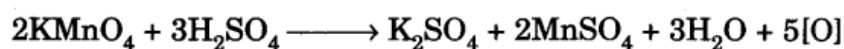


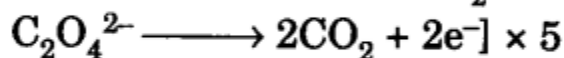
## Prepare M/50 Solution of Oxalic Acid. With its help, Determine 50 the Molarity & Strength of the Given Solution of Potassium Permanganate (KMnO<sub>4</sub>)

### Chemical Equations

#### Molecular equations



#### Ionic equations



### Indicator

KMnO<sub>4</sub> is a self-indicator.

### End Point

Colourless to permanent pink colour (KMnO<sub>4</sub> in burette).

### Procedure

1. Weigh 1.260 g of oxalic acid crystals and dissolve them in water to prepare 500 ml of M/50 oxalic acid solution using a 500 ml measuring flask. Rinse the pipette with the M/50 oxalic acid solution and pipette out 20 ml of it in a washed titration flask.
2. Rinse and fill the burette with M/100 KMnO<sub>4</sub> solution.
3. Add one test-tube (~ 20 ml) full of dilute sulphuric acid (~ 2 M) to the solution in titration flask.
4. Note the initial reading of the burette.
5. Now add KMnO<sub>4</sub> solution from the burette till a permanent light pink colour is imparted to the solution in the titration flask on addition of last single drop of KMnO<sub>4</sub> solution.

6. Note the final reading of the burette.
7. Repeat the above steps 4-5 times to get a set of three concordant readings.

### Observations

Weight of watch glass = ..... g

Weight of watch glass + Mohr's salt = .....g

Weight of Mohr's salt = 1.260 g

Volume of Mohr's salt solution prepared = 500 ml

Volume of Mohr's salt solution taken for each titration = 20.0 ml

Molarity of  $\text{KMnO}_4$  solution = M/50

<b>S. No.</b>	<b>Initial reading of the burette</b>	<b>Final reading of the burette</b>	<b>Volume of the <math>\text{KMnO}_4</math> solution used</b>
1.	—	—	— ml
2.	—	—	— ml
3.	—	—	— ml
4.	—	—	— ml

Concordant volume =  $x$  ml (say).

### Calculations

(a) Molarity of the  $\text{KMnO}_4$  solution

From the overall balanced chemical equation it is clear that 2 moles of  $\text{KMnO}_4$  react with 5 moles of oxalic acid.

$$\therefore \frac{M_{\text{KMnO}_4} \times V_{\text{KMnO}_4}}{M_{\text{oxalic acid}} \times V_{\text{oxalic acid}}} = \frac{2}{5}$$

where,  $M_{\text{KMnO}_4}$  = Molarity of  $\text{KMnO}_4$  solution

$V_{\text{KMnO}_4}$  = Volume of  $\text{KMnO}_4$  solution

$M_{\text{oxalic acid}}$  = Molarity of Mohr's salt solution

$V_{\text{oxalic acid}}$  = Volume of Mohr's salt solution

$$\frac{M_{\text{KMnO}_4} \times x}{1/50 \times 20} = \frac{2}{5}$$

$$M_{\text{KMnO}_4} = \frac{2}{5} \times \frac{2}{5x} = \frac{4}{25x}$$

(b) *Strength of the  $\text{KMnO}_4$  solution*

Strength (in g/l) = Molarity  $\times$  Molar mass

$$= \frac{4}{25x} \times 158$$

#### **Instructions for the Preparation of Solutions**

Provide the following :

1. Oxalic acid crystals
2.  $\text{KMnO}_4$  solution (1.26 g/litre)
3. 4N  $\text{H}_2\text{SO}_4$ .