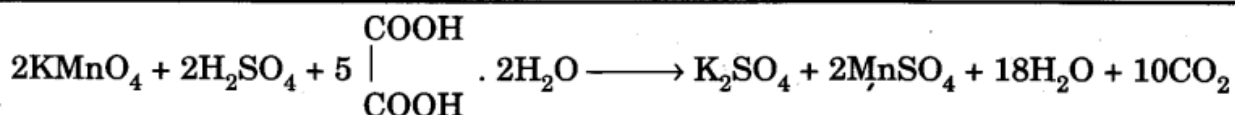
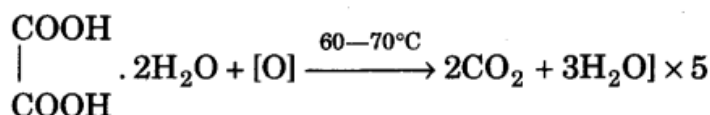
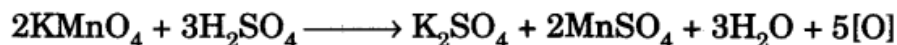


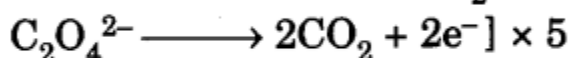
Find Out the Percentage Purity Of Impure Sample Of Oxalic Acid. You Are Supplied M/100 KMnO₄ Solution

Chemical Equations

Molecular equations



Ionic equations



Indicator

KMnO₄ is a self-indicator.

End Point

Colourless to permanent pink colour (KMnO₄ in burette).

Procedure

1. Weigh exactly 2.0 g of oxalic acid and dissolve in water to prepare 500 ml of its solution using a 500 ml measuring flask. Rinse the pipette with the oxalic acid solution and pipette out 20 ml of it in a washed titration flask.
2. Rinse and fill the burette with M/100 KMnO₄ 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. Heat the flask to 60-70°C and add KMnO₄ solution from the burette till a permanent light pink colour just appears in the solution in the titration flask.
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 = 2.00 g

Volume of Mohr's salt solution prepared = 500 ml

Solution taken in burette = M/100 KMnO_4

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

S. No.	Initial reading of the burette	Final reading of the burette	Volume of the KMnO_4 solution used
1.	—	—	— ml
2.	—	—	— ml
3.	—	—	— ml
4.	—	—	— ml

Concordant volume = x ml (say).

Calculations

(a) Molarity of the KMnO_4 solution

From the overall balanced chemical equation it is clear that 2 moles of KMnO_4 react with 5 moles of oxalic acid.

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

$$\frac{\frac{1}{100} \times x}{M_{\text{oxalic acid}} \times 20} = \frac{2}{5}$$

$$M_{\text{oxalic acid}} = \frac{x}{800}$$

(ii) *Strength of oxalic acid solution (in g/l)*

$$= \text{Molarity} \times \text{Molar mass}$$

$$= \frac{x}{800} \times 126 = y \text{ g/litre (say).}$$

(iii) *Percentage purity of oxalic acid*

$$= \frac{\text{Strength of pure sample}}{\text{Strength of the given sample}} \times 100$$

$$= \frac{y}{4} \times 100$$

Instructions for the Preparation of Solutions

Provide the following :

1. Impure sample of oxalic acid
2. KMnO_4 solution (1.58 g/litre)
3. 4N H_2SO_4 .