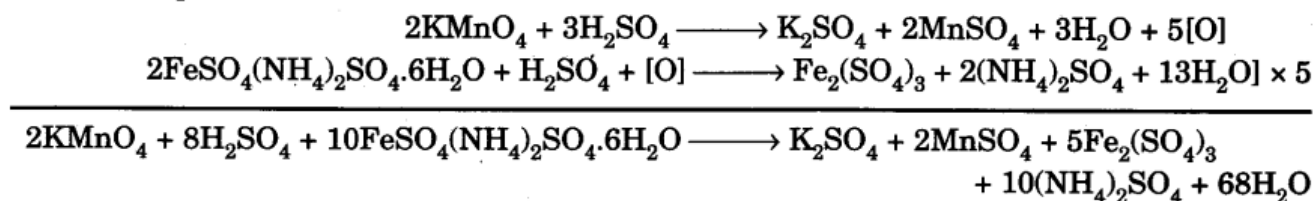


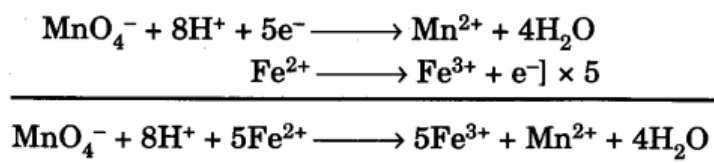
**Prepare M/20 Ferrous Ammonium Sulphate (Mohr's salt)
Solution. Find out the Percentage Purity of Impure
KMnO₄ Sample 2.0 g of Which have been Dissolved per Litre**

Chemical Equations

Molecular equations



Ionic equations



Indicator

KMnO₄ is a self-indicator.

End Point

Colourless to permanent pink colour (KMnO₄ in burette).

Procedure

1. Prepare 250 ml of M/20 Mohr's salt solution by dissolving 4.9 g of Mohr's salt in water as described in experiment 11.4. Rinse the pipette with the M/20 Mohr's salt solution and pipette out 20.0 ml of it in a washed titration flask.
2. Rinse and fill the burette with the given 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. Now add KMnO₄ 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 KMnO₄ 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 = 4.9 g
 Volume of Mohr's salt solution prepared = 250 ml

Solution taken in burette = KMnO_4 solution

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

Calculation of molarity of KMnO_4 solution

From the overall balanced chemical equation, it is clear that 2 moles of KMnO_4 react with 10 moles of Mohr's salt.

$$\therefore \frac{M_{\text{KMnO}_4} \times V_{\text{KMnO}_4}}{M_{\text{Mohr's salt}} \times V_{\text{Mohr's salt}}} = \frac{2}{10}$$

where, M_{KMnO_4} = Molarity of KMnO_4 solution

V_{KMnO_4} = Volume of KMnO_4 solution

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

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

$$\frac{M_{\text{KMnO}_4} \times x}{1/20 \times 20} = \frac{2}{10}$$

$$M_{\text{KMnO}_4} = \frac{2}{10} \times \frac{1}{x} = \frac{2}{10x}$$

Calculation of strength of KMnO_4 solution

$$\begin{aligned} \text{Strength (in g/litre)} &= \text{Molarity} \times \text{Molar of } \text{KMnO}_4 \\ &= M_{\text{KMnO}_4} \times 158 \\ &= \frac{2}{10x} \times 158 = a \text{ g/litre (say).} \end{aligned}$$

Calculation of percentage purity of the given sample

$$\text{Percentage purity} = \frac{a}{2} \times 100$$

Instructions for the Preparation of Solutions

Provide the following:

1. Crystals of Mohr's salt
2. KMnO_4 solution (1.6 g/litre)
3. 4N H_2SO_4 .