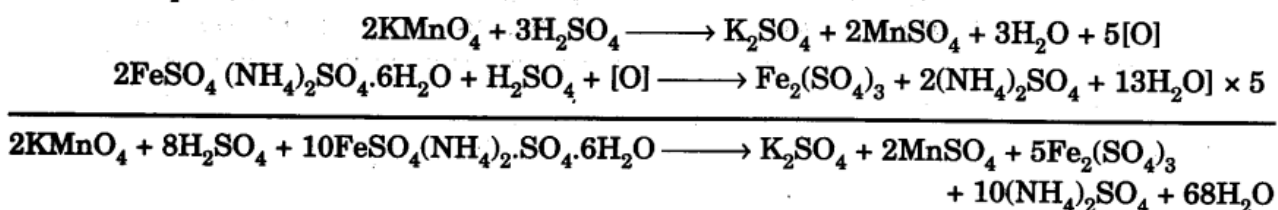


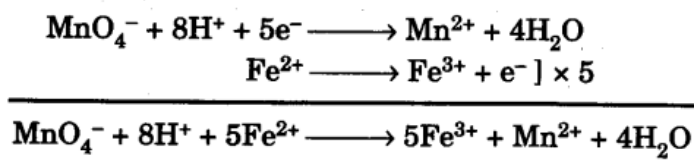
## Prepare M/20 Solution of Ferrous Ammonium Sulphate (Mohr's salt). Using this Solution Find out the Molarity & Strength of the Given $\text{KMnO}_4$ Solution

### Chemical Equations

#### Molecular equations



#### Ionic equations



### Indicator

$\text{KMnO}_4$  is a self-indicator.

### End Point

Colourless to permanent pink colour ( $\text{KMnO}_4$  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 20 as described in experiment 11.3. 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  $\text{KMnO}_4$  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  $\text{KMnO}_4$  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  $\text{KMnO}_4$  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 = 4.90 g

Volume of Mohr's salt solution prepared = 250 ml

Molarity of Mohr's salt solution = M/20

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

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

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

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

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

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

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

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

$$= \frac{2}{10x} \times 158$$

#### Instructions for the Preparation of Solutions:

Provide the following:

1. Crystals of Mohr's salt
2. M/100  $\text{KMnO}_4$  solution (1.58 g/litre)
3. 4N  $\text{H}_2\text{SO}_4$ .