

Aim:

~~Practical~~
To perform the chemical assay of Ferrous Sulphate.

Reference:-Requirements:-

- (a) Glasswares: Conical flask, beaker, burette, measuring cylinder, funnel, glass rod, dropper etc.
- (b) Reagents:- Ferrous sulphate (1g), 0.1 N potassium permanganate (KMnO_4), dil. sulphuric acid.

Reagent Preparation:

0.1 N KMnO_4 : Dissolve 3.3g of reagent grade potassium permanganate (KMnO_4) in 1L of purified water and heat on a steam bath for two hours. Cover and allow standing for 24 hours.

Principle:

It is assayed by redox titrations.

Observation

S.No.	Initial reading	final reading	Vol. consumed.
1.	0	6.4	6.4 ml
2.	6.4	12.7	6.3 ml
3.	12.7	18.6	5.9 ml

$$\text{Average} = \frac{6.4 + 6.3 + 5.9}{3} = 6.2 \text{ ml}$$

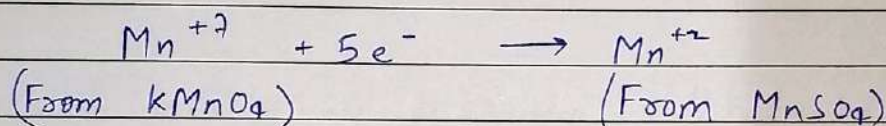
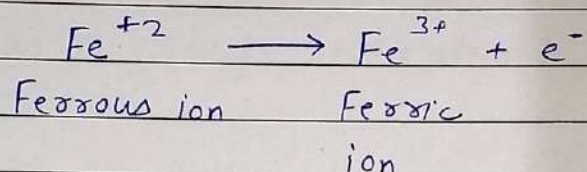
Calculation :-

$$\% \text{ purity w/w} = \frac{\text{ml of potassium permanganate required} \times \text{Normality of permanganate} \times 0.00278 \times 100}{\text{Weight of sample} \times 0.1}$$

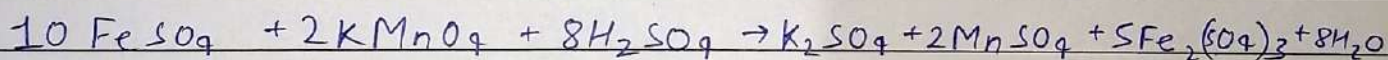
$$= \frac{6.2 \times 0.1 \times 0.00278 \times 100}{0.2 \times 0.1}$$

$$= 8.61 \%$$

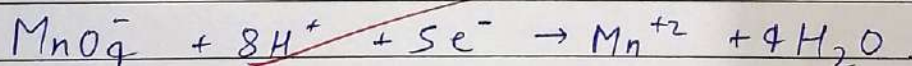
In the reaction of chemical assay, ferrous sulphate is oxidised to ferric sulphate and the electron released during oxidation is helpful in the reduction of manganese ion from Mn^{+7} to Mn^{+2} . Hence $KMnO_4$ (potassium permanganate) here is used as an oxidising agent.



Overall reaction is



OR



Procedure :

1. An accurately weighed 1 gm powder is dissolved in 25 ml of water in a conical flask.
2. Now add 20 ml of dilute sulphuric acid and this solution is ~~treated~~ titrated against 0.1 N $KMnO_4$ until a faint pink colour is obtained.

Teacher's Signature _____

3. Note down the volume of KMnO_4 consumed.

Each 1ml of 0.1N $\text{KMnO}_4 \equiv 0.0291$ gm of ferrous sulphate.

Note:- Here 0.1N KMnO_4 solution taken in the burette act as a self-indicator.

~~Ex~~

Result:-

The % purity of ferrous sulphate by chemical assay was found to be 8.62 %