

Percentage purity can be determined by the following formula:

$$\% \text{ purity of FeSO}_4 = \frac{\text{Vol. of 0.1 N KMnO}_4 \times \text{I.P. Factor} \times 100 \times \text{N of KMnO}_4 \text{ (actual)}}{\text{Weight of FeSO}_4 \times \text{N of KMnO}_4 \text{ (exp)}}$$

I.P. FACTOR: Each ml of 0.1 N KMnO₄ is equivalent to 0.0278 g of FeSO₄.

Practical - 9

Date: / /

Aim: To determine the percent purity of Ferrous sulphate in a given sample.

Reference:.....
.....

Requirements:

Apparatus/Equipment required:.....

Chemical required:.....
.....

Principle

0.02 M (M/50) potassium permanganate solution is standardized by titration against the primary standard such as sodium oxalate or arsenic trioxide or oxalic acid or by using another secondary standard like sodium thiosulphate solution.

Potassium permanganate reacts with potassium iodide in highly acidic conditions to liberate iodine. This iodine is titrated with sodium thiosulphate using starch as an indicator. Starch if added initially, degrades in highly acidic conditions; also, as the concentration of iodine is very high at the initial stage, starch may form an irreversible complex with iodine, so it is added towards the end of the titration.

Procedure

Preparation of 0.02 M potassium permanganate standard solution

1. Dissolve 3.2 g of potassium permanganate in 1000 ml of water.
2. Heat on a water-bath for 1 hour.
3. Allow to stand for 2 days and filter through glass wool.
4. Standardize the solution in the following manner.

Standardization of 0.02 M Potassium permanganate solution

1. **Addition of potassium iodide:** To 25.0 ml of the solution in a glass-stoppered flask add 2 g of potassium iodide.
2. **Addition of sulphuric acid:** Add 10 ml of 1 M sulphuric acid
3. **Titration of liberated iodine:** Titrate the liberated iodine with 0.1 M sodium thiosulphate, using 3 ml of starch solution, added towards the end of the titration, as an indicator.
4. **Blank determination:** Perform a blank determination and make the necessary correction.
5. Store, protected from light.
6. 1 ml of 0.1 M sodium thiosulphate is equivalent to 0.003161 g of KMnO_4 .

Report: The percentage purity of Ferrous sulphate is.....
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Questions Bank

1. Write the chemical formula of Ferrous Sulphate.
2. Write the formula of molality.
3. What is the starch?
4. Write the chemical formula of sodium thiosulphate.
5. What is the colour of potassium Iodide powder?
6. Which are the reducing agents?
7. Write a short note of titrant?
8. What are the primary and secondary standard?
9. Calculate the oxidation number of Mn in KMnO_4 .
10. Ferrous sulphate is a salt, acid or base. Identify it.