

Assay of ferrous sulphate

AIM: To perform the assay of the given sample of ferrous sulphate.

APPARATUS: burette, pipette, conical flask etc.

CHEMICALS: 0.1 N KMnO_4 solution, 0.1 N oxalic acid, dil. H_2SO_4 , FeSO_4 .

PRINCIPLE: Ferrous sulfate is an example of reducing agent and this titration is an example of redox titration. KMnO_4 is a powerful oxidant. In the presence of dil H_2SO_4 ferrous sulfate is oxidized to ferric sulfate. As soon as the oxidation of ferrous sulfate is completed addition of a drop of KMnO_4 produces permanent pink color which indicates the end point. No indicator is required as KMnO_4 is a self-indicator.

PROCEDURE:

1. For standardization of 0.1 N KMnO_4 solution: Into a conical flask pipette out exactly 10 ml of 0.1 N oxalic acid. Add 10 ml dil H_2SO_4 and boil the contents of the flask upto 70°C . Titrate the contents of the flask against 0.1 N KMnO_4 solution until a faint pink color is obtained. Repeat the titration to get concurrent values.
2. For assay: weigh accurately about 1 gm of FeSO_4 and dissolve in 20 ml of dil H_2SO_4 . Titrate against 0.1 N KMnO_4 solution till a permanent pink color is obtained. Repeat the titration to get concurrent values.

I.P. FACTOR: Each ml of 0.1 N KMnO_4 is equivalent to 0.0278 g of FeSO_4 .

FORMULA:

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

RESULT: The percentage purity of the given sample of FeSO_4 is

