



Practical
Organic Pharmaceutical Chemistry
3rd Stage (2nd course)
Lab. 2

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Assay of ferrous sulfate

Aim of the experiment:

In this Experiment you will Find out the Weight of an Unknown Sample of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$.

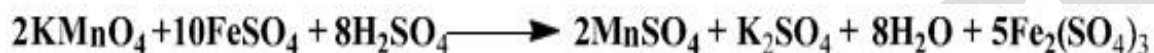
Introduction:

Ferrous Sulfate Heptahydrate ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, m. wt. =278.01) is a Light Green Crystalline Powder or Bluish-Green Crystals, Efflorescent in Air. It is Oxidized in Moist Air, Becoming Brown. It is Freely Soluble in Water, Very Soluble in Boiling Water, and Practically Insoluble in Alcohol.

Ferrous Sulfate Heptahydrate is used as a Source of Iron (for Iron-Deficiency Anaemia) in Oral Liquid Dosage forms whereas the Dried form (Exsiccated Ferrous Sulfate) is often used in Solid Dosage forms.

Chemical principle:

Ferrous Sulfate Heptahydrate is Assayed Against 0.1 N Potassium Permanganate Solution in Acidic Medium following Oxidation- Reduction Reaction.



Procedure:

- 1) Dissolve about Xg of the Unknown (Accurately Weighted) in 25ml Dilute Sulfuric Acid (2.5% V/V).
- 2) Titrate with 0.1N Potassium Permanganate Solution Until getting a Persistent Faint Pink Colour.

Calculations:

$$\text{Wt}_{\text{F.S}} = \text{Vol.}_{\text{P.P}} * \text{Chem. Fac.}$$

Each 1 mL of 0.1 N KMnO_4 is equivalent to 0.027801g of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$. This is Calculated as follows:

$$10 \text{ mol. wt. of } \text{FeSO}_4 \cdot 7\text{H}_2\text{O} \equiv 2 \text{ mol. wt. of } \text{KMnO}_4$$

$$10 \text{ mol. wt. of } \text{FeSO}_4 \cdot 7\text{H}_2\text{O} \equiv 10 \text{ eq. wt. of } \text{KMnO}_4$$

$$278.01 \text{ g of } \text{FeSO}_4 \cdot 7\text{H}_2\text{O} \equiv 1 \text{ L of } 1 \text{ N } \text{KMnO}_4$$

$$0.027801 \text{ g } \text{FeSO}_4 \cdot 7\text{H}_2\text{O} \equiv 1 \text{ mL of } 0.1 \text{ N } \text{KMnO}_4$$

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