

**Aim:** To perform the identification test for ferrous sulphate

**Requirements:**

**Chemicals & Reagents:** Ferrous sulphate crystals, dilute  $\text{H}_2\text{SO}_4$ , phenanthroline, ceric ammonium sulphate, potassium ferricyanide, dilute  $\text{HCl}$ , potassium ferrocyanide, barium chloride, lead acetate, ammonium acetate, dilute  $\text{NaOH}$ , iodine solution, strontium chloride.

**Glassware:** Test tube, beaker, funnel watch glass, spatula

**Chemical Formula:**  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$

**Theory:** Ferrous sulfate occurs as a crystalline bluish green powder. It has a tendency to rapidly oxidize on exposure to moist air. It is odorless and is characterized through its metallic taste (styptic) taste. It is soluble in water but insoluble in alcohol.

**Use:** It is used as an important hematinic agent in various iron formulations for treatment of The identification reactions for ferrous sulphate are summarized as below:

**A) Identification test for  $\text{Fe}^{+2}$**

Sr. No	Test	Observation	Inference
1.	To a small quantity of salt, add dilute $\text{H}_2\text{SO}_4$ and phenanthroline	Red colouration	$\text{Fe}^{+2}$ may be present
2.	Add ceric ammonium sulphate	Red colour discharged	$\text{Fe}^{+2}$ is confirmed
3.	Take salt and add potassium ferricyanide	Blue precipitates observed	$\text{Fe}^{+2}$ is confirmed
4.	Add dilute $\text{HCl}$	Precipitates are insoluble	$\text{Fe}^{+2}$ ion confirmed
5.	Take salt and add potassium ferrocyanide and add dilute $\text{HCl}$	White precipitates are formed and rapidly becomes blue	$\text{Fe}^{+2}$ may be present
6.	Add dilute $\text{HCl}$	The precipitates are insoluble	$\text{Fe}^{+2}$ is confirmed

**Result:** The given sample contains  $\text{Fe}^{+2}$  cations.

**B) Identification test for  $\text{SO}_4^{2-}$**

Sr. No	Test	Observation	Inference
1.	To a small quantity of salt, add water with dilute $\text{HCl}$ and $\text{BaCl}_2$	White precipitate	$\text{SO}_4^{2-}$ may be present
2.	Take salt and add lead acetate	White precipitate	$\text{SO}_4^{2-}$ may be present
3.	Add $\text{CH}_3\text{COONH}_4$ with $\text{NaOH}$	Precipitate dissolve	$\text{SO}_4^{2-}$ ion confirmed
4.	Take salt and add iodine solution	Suspension of yellow colour is obtained	$\text{SO}_4^{2-}$ may be present
5.	To the above suspension, add $\text{SnCl}_2$ and boil the mixture	No colour precipitate obtained	$\text{SO}_4^{2-}$ ion confirmed

**Result:** The given sample contains  $\text{SO}_4^{2-}$  anions.