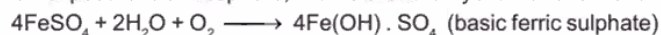


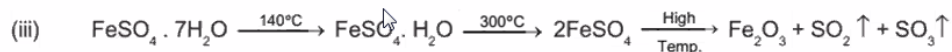
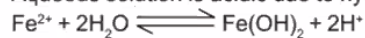
Chemical property

(b) Chemical :

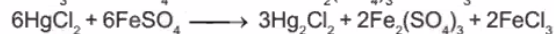
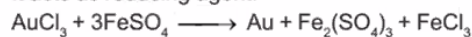
(i) On exposure to atmosphere, it turns brownish-yellow due to the formation of basic ferric sulphate.



(ii) Aqueous solution is acidic due to hydrolysis.



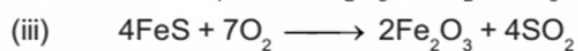
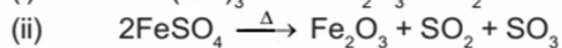
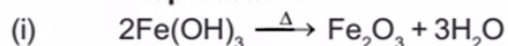
(v) It acts as reducing agent.



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Ferric Oxide, Fe_2O_3 :

● Preparation :

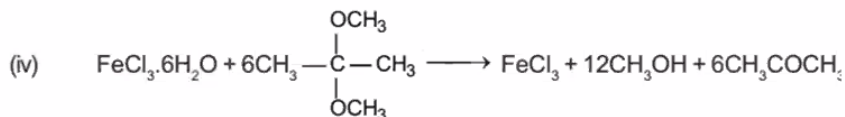
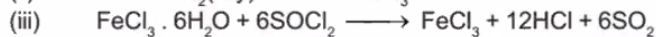
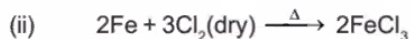
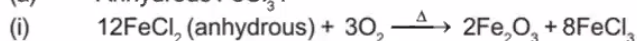


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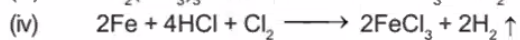
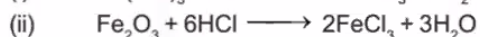
Ferric Chloride, FeCl_3 :

● Preparation :

(a) Anhydrous FeCl_3 :



(b) Hydrated FeCl_3 :



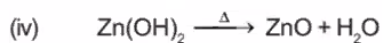
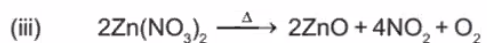
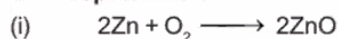
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COMPOUNDS OF ZINC :

Zinc oxide, ZnO (Chinese white or philosopher's wool)

It is found in nature as zincite or red zinc ore.

● Preparation :



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Zinc Sulphate, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ (White vitriol)

- Preparation :**
 - $\text{Zn} + \text{H}_2\text{SO}_4 \longrightarrow \text{ZnSO}_4 + \text{H}_2$
 - $\text{ZnO} + \text{H}_2\text{SO}_4 \longrightarrow \text{ZnSO}_4 + \text{H}_2\text{O}$
 - $\text{ZnCO}_3 + \text{H}_2\text{SO}_4 \longrightarrow \text{ZnSO}_4 + \text{H}_2\text{O} + \text{CO}_2$
- Properties :**

(a) **Physical :** It is a colourless, crystalline solid soluble in water. It slowly effloresces when exposed to air. It is isomorphous with Epsom salt ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$)

Chemical :

$$\text{ZnSO}_4 + 2\text{NaOH} \longrightarrow \text{Zn(OH)}_2 \downarrow (\text{white}) + \text{Na}_2\text{SO}_4$$

$$\text{Zn(OH)}_2 + 2\text{NaOH} \longrightarrow \text{Na}_2\text{ZnO}_2 (\text{soluble complex}) + 2\text{H}_2\text{O}$$

$$\text{ZnSO}_4 + 2\text{NaHCO}_3 \longrightarrow \text{ZnCO}_3 + \text{Na}_2\text{SO}_4 + \text{H}_2\text{O} + \text{CO}_2$$

$$\text{ZnSO}_4 \cdot 7\text{H}_2\text{O} \xrightarrow{100^\circ\text{C}} \text{ZnSO}_4 \cdot 6\text{H}_2\text{O} \xrightarrow{280^\circ\text{C}} \text{ZnSO}_4 \xrightarrow{800^\circ\text{C}} \text{ZnO} + \text{SO}_3$$

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Cupric Oxide, CuO

It is called black oxide of copper and is found in nature as tenorite.

Preparation : It is prepared

By heating Cu_2O in air or by heating copper for a long time in air (the temperature should not exceed above 1100°C)

$$2\text{Cu}_2\text{O} + \text{O}_2 \longrightarrow 4\text{CuO}$$

$$2\text{Cu} + \text{O}_2 \longrightarrow 2\text{CuO}$$

$$\text{Cu(OH)}_2 \xrightarrow{\Delta} \text{CuO} + \text{H}_2\text{O}$$

$$2\text{Cu(NO}_3)_2 \xrightarrow{\Delta} 2\text{CuO} + 4\text{NO}_2 + \text{O}_2$$

On a commercial scale, it is obtained by heating/calcination of malachite which is found in nature.

$$\text{CuCO}_3 \cdot \text{Cu(OH)}_2 \longrightarrow 2\text{CuO} + \text{CO}_2 + \text{H}_2\text{O}$$

Properties

The oxide dissolves in acids HCl , H_2SO_4 or HNO_3 forming corresponding salts.

$$\text{CuO} + 2\text{H}^+ \longrightarrow \text{Cu}^{2+} + \text{H}_2\text{O}$$

When heated to $1100 - 1200^\circ\text{C}$, it is converted into cuprous oxide with evolution of oxygen.

$$4\text{CuO} \longrightarrow 2\text{Cu}_2\text{O} + \text{O}_2$$

It is reduced to metallic copper by reducing agents like hydrogen, carbon and carbon monoxide.

$$\text{CuO} + \text{H}_2 \longrightarrow \text{Cu} + \text{H}_2\text{O}$$

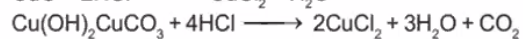
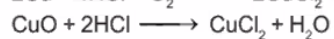
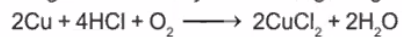
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Cupric Chloride, $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$

Preparation :

The metal or cupric oxide or cupric hydroxide or copper carbonate is dissolved in concentrated HCl.

The resulting solution on crystallisation gives green crystals of hydrated cupric chloride.



Silver Nitrate, AgNO_3 (Lunar caustic) :

It is prepared by heating silver with dilute nitric acid. The solution is concentrated and cooled when the crystals of silver nitrate separate out.

