

(Note down in science class work copy who have got their science copies/rough copy and study it by heart thoroughly)

Materials: Metals and Non-metals

(In-text Notes-3: In-text Question-Answer)

1. What is rusting?

Ans. Rusting is a process of chemical change on an iron surface exposed in contact with moist air which is observed as a reddish-brown layer called rust on the iron surface.

Chemically, it is the result of oxidation of iron i.e. the reaction of iron with oxygen in air in the presence of moisture to form a layer of Ferric Oxide or Iron Oxide or Red Oxide.

2. What is rust?

Ans. Chemically, rust is a chemical compound called Ferric Oxide which appears as a reddish brown layer on an iron surface exposed to moist air. It forms due to slow oxidation process of the iron in contact with moist air.

The chemical formula of rust is $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$

3. How is rust formed on an iron surface? OR How does rusting take place? Write the chemical reaction for rust formation.

Ans. Rusting takes place due to the reaction of iron with oxygen in contact with moist air.

The chemical reaction for rust formation is as followed:



4. What change of colour is observed when iron nails are dropped in a solution of Copper Sulphate and why?

Ans. Iron being more reactive than copper will displace copper from **Copper Sulphate solution (Blue Colour)** and form a subsequent solution of **Ferrous Sulphate (Green Colour)**. This is an example of a Displacement reaction.



5. Why are aluminium and copper used as electrical wires?

Ans. The reasons are as followed:

- i) Metals are good conductor of electricity.
- ii) Aluminium and copper are comparatively more ductile than iron and also bear accessible price.
- iii) Can tolerate high temperatures subjected to environment and electrical/mechanical/electronic devices.

6. Give examples of some non-metals which are commercially important and also write their special uses.

Ans. Uses of some commercially used non-metals:

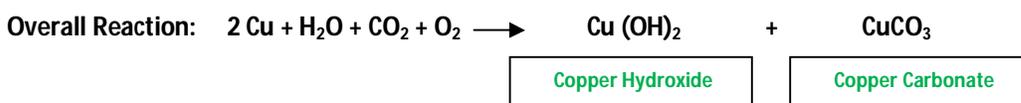
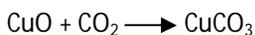
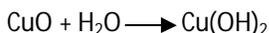
1. Woods and Thermosetting plastics (heat resisting plastics) are used to make furniture, inside doors, plates etc.
2. Thermoplastics (flexible plastics) are used to make bags and pouches. The thermoplastic called PVC (polyvinyl chloride) is used to cover the electrical wires as insulators.
3. Bakelite, a well known thermosetting plastic is used to make electric switches and electric boards.
4. Carbon is an electric-conducting non-metal which is used to make electric cells.
5. The Carbon in the form of graphite is used to make pencil leads and diamond is a form of carbon is a well-known precious stone in the field of jewellery.

7. Name a non-metal which –

- i) Is required for the respiration in living organisms. **Oxygen**
- ii) Is used as a disinfectant in water purification process. **Chlorine**
- iii) Is a purple-coloured solution which is applied on wounds as an antiseptic. **Iodine**
- iv) Is used as an important component of fertilizers. **Nitrogen/Phosphorous**
- v) Is used as an antioxidant inside the packets of chips, snacks and biscuits. **Nitrogen gas**
- vi) Is used inside the electric bulbs as filling gas. **Argon gas/Neon gas**

8. When a copper vessel is exposed to moist air for long, it acquires a dull green coating. Describe this as a chemical change with support of the respective chemical reaction.

Ans. Prolonged exposure of Copper to moist air, causes its corrosion i.e. oxidation of copper (similar as rusting of iron). Here the **greenish layer** is a mixture of copper hydroxide and copper carbonate forming in this oxidation process.



9. It is often advised by our elders not to keep curd, pickle, lemon juice or any other sour food item in copper containers. Justify the scientific reason behind.

Ans. The curd, pickle, lemon juice generally contains acid which make them a desirable sour in taste. If they are kept in copper container the acid will react with copper to form metallic salt by displacing the hydrogen present in the acid. This will cause undesirable chemical changes in both the food item and the vessel.