www.amkresourceinfo.com

AMK Resource World





CLASS 10 – SCIENCE SOLUTIONS

CHPATER 3: METALS AND NON-METALS

1. Which of the following pairs will give displacement reactions?

Answer: (d) AgNO₃ solution and copper metal

Copper is more reactive than silver, hence it displaces silver from AgNO₃.

2. Which of the following methods is suitable for preventing an iron frying pan from rusting?

Answer: (d) All of the above All listed methods – applying grease, paint, or a coating of zinc – can prevent rusting.

3. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be:

Answer: (a) calcium

Calcium forms calcium oxide, which has a high melting point and is soluble in water forming calcium hydroxide.

4. Food cans are coated with tin and not with zinc because:

Answer: (c) zinc is more reactive than tin Zinc would react with acids present in food more readily than tin.

5. (a) Use of a hammer, battery, bulb, wires and switch to distinguish between metals and non-metals:

• Hammer: Metals are malleable, so they can be beaten into sheets. Non-metals break.

• Electric circuit: Metals conduct electricity and light up the bulb. Non-metals do not.

(b) These tests are effective in distinguishing metals (malleable and conductive) from non-metals (brittle and non-conductive).

6. What are amphoteric oxides? Give two examples.

Answer: Oxides that react with both acids and bases to form salt and water. Examples: Aluminium oxide (Al₂O₃), Zinc oxide (ZnO)

7. Two metals that displace hydrogen from dilute acids:

Answer: Zinc, Iron Two metals that do not displace hydrogen: Copper, Silver

8. Electrolytic refining of metal M:

Anode: Impure metal M Cathode: Pure metal M Electrolyte: Salt solution of metal M (e.g., CuSO₄ for copper)

9. Sulphur powder heated (Pratyush's experiment):

(a)

(i) Dry litmus pape<mark>r</mark> – No change

(ii) Moist litmus paper – Turns red (acidic gas SO₂ formed)

(b) Equation:

 $S + O_2 \rightarrow SO_2$

10. Two ways to prevent rusting of iron:

- Galvanisation (coating with zinc)
- Applying paint or grease

11. Type of oxides formed when non-metals combine with oxygen:

Answer: Acidic or neutral oxides

12. Give reasons:

(a) Platinum, gold, and silver are used in jewellery because they are lustrous and do not corrode.

(b) Sodium, potassium, lithium are stored under oil as they react vigorously with air and moisture.

(c) Aluminium forms a protective oxide layer, hence does not corrode and is used for cooking.

(d) Carbonate and sulphide ores are converted to oxides because it is easier to reduce oxides to extract metal.

13. Why lemon/tamarind cleans copper vessels:

Answer: Acids in lemon/tamarind react with basic copper carbonate (green layer) and remove it.

14. Difference between metals and non-metals (Chemical properties):

- Metals form basic oxides; non-metals form acidic/neutral oxides
- Metals displace hydrogen from acids; non-metals do not
- Metals form cations; non-metals form anions
- Metals react with oxygen to form metal oxides; non-metals form non-metal oxides

15. Detective clue (reduced weight of gold bangles):

Answer: The man likely used Aqua Regia (mixture of HCl and HNO₃ in 3:1 ratio) – it dissolves gold.

16. Why copper is used in hot water tanks and not steel:

Answer: Copper does not react with water and resists corrosion, unlike steel (iron alloy) which rusts.

