



মহাশিক্ষা বিভাগ (সি)
DEPARTMENT OF EDUCATION (S)

Government of Manipur

Chapter -4.

METALS AND NON-METALS

SOLUTIONS:

EXERCISES:

1. Which of the following can be beaten into thin sheets?

- (a) Zinc (b) Phosphorus (c) Sulphur (d) Oxygen

Ans. (a) Zinc

2. Which of the following statements is correct?

- (a) All metals are ductile.
(b) All non-metals are ductile.
(c) Generally, metals are ductile.
(d) Some non-metals are ductile.

Ans. (c) Generally, metals are ductile.

3. Fill in the blanks.

- (a) Phosphorus is a very _____ non-metal.
(b) Metals are _____ conductors of heat and _____.
(c) Iron is _____ reactive than copper.
(d) Metals react with acids to produce _____ gas.

Ans: (a). reactive (b). good, electricity (c) more (d) hydrogen

4. Mark "T" if the statement is true and "F" if it is false.

- (a) Generally, non-metals react with acids. (F)
(b) Sodium is a very reactive metal. (T)
(c) Copper displaces zinc from zinc sulphate solution. (F)
(d) Coal can be drawn into wires. (F)

5. Some properties are listed in the following Table. Distinguish between metals and non-metals on the basis of these properties.

Sl. No.	Properties	Metals	Non-metals
1.	Appearance	Metals have a Luster (shiny) surface.	Non-metals are dull in appearance.
2.	Hardness	Generally hard except sodium & Potassium	Generally soft except diamond.
3.	Malleability	Metals are malleable except zinc, arsenic and antimony.	Non-metals are non-malleable.
4.	Ductility	Metals are generally ductile.	Non-metals are not ductile.
5.	Heat Conduction	Metals are generally good conductors of heat.	Non-metals are poor conductor of heat.
6.	Conduction of Electricity	Metals generally conduct electricity.	Non-metals do not conduct electricity.

6. Give reasons of the following.

(a) Aluminium foils are used to wrap food items.

Ans. Because aluminium being malleable metal, it can be beaten into thin wrapping sheet and does not react with food items.

(b) Immersion rods for heating liquids are made up of metallic substances.

Ans. Because metallic substances are good conductors of heat and electricity.

(c) Copper cannot displace zinc from its salt solution.

Ans. Because copper is less reactive than zinc so it cannot displace zinc from its salt solution.

(d) Sodium and potassium are stored in kerosene.

Ans. Because sodium and potassium are very reactive metals. They catch fire if exposed to air and water. So to prevent these metals from direct contact to any moisture in the air and water, both the metals are stored in kerosene.

7. Can you store lemon pickle in an aluminium utensil? Explain.

Ans. No, we cannot store lemon pickle in aluminium utensil because acids present in lemon pickle will react with aluminium (metal) utensil and liberate hydrogen gas which can spoil the pickle.

8. Match the substances given in column **A** with their uses given in Column **B**.

A	B
(i) Gold	(a) Thermometers
(ii) Iron	(b) Electric wire
(iii) Aluminium	(c) Wrapping food
(iv) Carbon	(d) Jewellery
(v) Copper	(e) Machinery
(vi) Mercury	(f) Fuel

Ans.

A	B
(i) Gold	(d) Jewellery
(ii) Iron	(e) Machinery
(iii) Aluminium	(c) Wrapping food
(iv) Carbon	(f) Fuel
(v) Copper	(b) Electric wire
(vi) Mercury	(a) Thermometers

9. What happens when

(a) Dilute sulphuric acid is poured on a copper plate?

(b) Iron nails are placed in copper sulphate solution?

Write word equations of the reactions involved.

(a) Ans. When dilute sulphuric acid is poured on a copper plate, copper will displace the hydrogen from the acid and form copper sulphate and hydrogen gas.



(b) Ans. When iron nails are placed in copper sulphate solution, the blue colour of copper sulphate solution fades and becomes light green colour, and iron nail becomes brownish in colour. As iron is more reactive than copper, it will displace copper and form iron sulphate.



10. Saloni took a piece of burning charcoal and collected the gas evolved in a test tube.

(a) How will she find the nature of the gas?

(b) Write down word equations of all the reactions taking place in this process.

Ans. (a) When charcoal (carbon) is burnt it produce carbon dioxide gas.

- When the collected gas is allowed to pass into lime water, it will turn milky.
- The evolved gas can be made into solution using water. The solution turns red when tested with litmus paper. Thus, the gas evolved is acidic in nature.

(b) (i) Carbon (C) + Oxygen (O₂) \longrightarrow Carbon dioxide (CO₂)
(from air)

(ii) Carbon dioxide (CO₂) + Lime water \longrightarrow Milky

(iii) Carbon dioxide reacts with water to form carbonic acid, which turns blue litmus paper to red.

Carbon dioxide (CO₂) + Water (H₂O) \longrightarrow Carbonic acid (H₂CO₃)

11. One day Reeta went to a jeweller's shop with her mother. Her mother gave an old jewellery to the goldsmith to polish. Next day when they brought the jewellery back, they found that there was a slight loss in its weight. Can you suggest a reason for the loss in weight?

Ans. As Gold is a metal, the goldsmith might have polished the gold in acidic solution. In this process certain amount of the gold will dissolve in acid to form gold oxide. This causes the loss of gold in the form of gold oxide.



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EXTRA QUESTION:

Q1. Define malleability. Give an example.

Ans. The property of metals by which they can be beaten into thin sheets is called malleability. Example aluminium.

Q2. Define ductility.

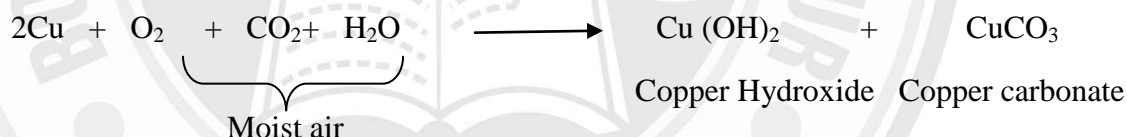
Ans. The property of metals by which it can be drawn into wires is called ductility.

Q3. Name a metal which is liquid at room temperature.

Ans. Mercury.

Q4. What happen when copper vessel is exposed to moist air for long? Give the reaction involved in it.

Ans. When copper vessel is exposed to moist air for long, it lose their luster and shine after some time and acquires a dull green coating on the surface. The green coating is formed due to the action of oxygen, carbon dioxide and water vapour present in the moist air on the surface of copper.



Q5. Why phosphorus is stored in water?

Ans. Phosphorus is a very reactive non-metal and it catches fire if exposed to air. So in order to prevent from direct contact with atmospheric oxygen it is stored in water.

Q6. Zinc can displace copper from copper sulphate solution but copper cannot displace zinc from zinc sulphate solution. Why?

Ans. Zinc metal is more reactive than copper, so it can displace copper from copper sulphate solution but copper being less reactive than zinc it cannot displace zinc from zinc sulphate solution.



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