

## 04. METALS AND NON-METALS

### Questions and Answers

#### 1. Explain the physical properties of metals with suitable examples?

##### A. Physical properties of metals:

(i) **Appearance** : Generally metals are lustrous. Most of the metals appear shining.

**Ex:** Gold, silver, copper

(ii) **Sonority**: When metals dropped on a hard surface produce a particular sound.

**Ex:** School bells, coins produce sound.

(iii) **Malleability** : Metals can be beaten and made into thin sheets.

**Ex:** Silver foils used in sweets.

(iv) **Ductility**: Metals can be drawn into fine wires.

**Ex:** Copper wires used in electric wires.

Iron mesh have iron strings.

(v) **Electrical conductivity**: Metals are good conductors of electricity.

**Ex:** Copper is used in electric wires.

(vi) **Heat conductivity**: Metals are good conductors of heat.

**Ex:** Aluminium, copper are is used in utensils.

(vii) **Physical state** : Generally metals are in solid state except like mercury, gallium.

(viii) **Hardness** : Generally metals are hard except like sodium, lithium.

#### 2. You are given two samples. How do you distinguish which one is metal and which is non-metal?

A. Let two samples were given. One is metal and the other is non-metal. Connect the samples in an electric circuit with a

battery, bulb and wires. From which material does the electricity pass, it is metal. And the other substance is non-metal.

#### 3. Which metals are used in making jewellery ? Why?

A. The metals that are used in jewellery are gold, platinum and silver. They do not react with air. They do not fade. So the jewellery made up of gold, platinum and silver. Silver tarnishes after a long time. So use of silver in jewellery is restricted.

#### 4. Which substance liberates hydrogen gas when reacts with metals?

A. Generally acids react with metals and liberate hydrogen gas.

#### 5. In a chemical reaction iron is unable to displace zinc from zinc sulphate. Why?

A. A less reactive metal can not displace a high reactive metal from its compound. Iron is less reactive metal than zinc. So Iron can not displace Zinc from Zinc sulphate.

#### 6. Why cooking pans don't have metal handles?

A. Metals are good conductors of heat. If handles of cooking pans made with metals, they also get heat along with the pans. Then it is difficult to handle pans. So the handles of cooking pans are not made of metals. They were made up of insulators of heat.

7. Sulphur dioxide is ..... [ b ]

- (a) basic oxide
- (b) acidic oxide
- (c) neutral oxide
- (d) amphoteric oxide

8. Match the following.

- (i) Making into thin sheets [        ] (a) ductility
- (ii) Shining materials [        ] (b) conductivity
- (iii) Making into wires [        ] (c) sonority
- (iv) Transmission of heat [        ] (d) lustrous
- (v) Making ringing sound [        ] (e) malleability

A.

- (i) Making into thin sheets [ e ] (a) ductility
- (ii) Shining materials [ d ] (b) conductivity
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- (iv) Transmission of heat [ b ] (d) lustrous
- (v) Making ringing sound [ c ] (e) malleability

9. Which gas makes 'pop' sound if exposed to lighted match stick?

A. Hydrogen gas makes 'pop' sound if exposed to lighted match stick.

10. Why are bells made up of metals instead of wood?

A. Metals when dropped on the hard surface or beaten with hard materials produce a particular sound. This property is called Sonority. Bells should produce ringing sound. Wood does not have sonority property. So bells made up of metals instead of wood.

11. Imagine the human life without metals, write briefly about the consequences.

A. We can not imagine the life of man without metals. Without metals

- (i) We can not use utensils to cook food.
- (ii) We can not use agricultural instruments to cultivation.
- (iii) We can not manufacture cars, trains and other vehicles.

(iv) We can not have electricity as the wires made up of copper, aluminium.

(v) No almirahs, No sewing machines, No scissors, No blades, No knives, No other materials which we are using in our daily life.

(vi) Simply if there is no metals, the stone age repeats.

12. After completion of metals and non metals chapter. Raheem understood that metals are hard and non-metals are soft. During the discussion with his brother he came to know that Diamond is a hardest material and it is a non-metal. Similarly mercury is a soft material and it is a metal. These findings from the discussion raised some questions in Raheem's mind. Can you guess those questions? Write them.

A. The following questions may be asked to Raheem.

- (i) Non-metals do not shine. But why diamond shines?
- (ii) Diamond shines. Why it is not treated as metal ?
- (iii) Generally metals are hard. Why mercury is in liquid state ?
- (iv) What is the content present in a diamond ?



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### 13. Discuss the acidic and basic nature of the metals and non-metals with suitable experiments.

A. Metals are neither acids nor bases.

Similarly non metals are also neither acids nor bases.

In general metallic oxides or their aqueous solutions are bases and non metallic oxides or their aqueous solutions are acids.

(i) Burn a magnesium ribbon. A white coloured ash that is magnesium oxide will form. Make the ash to be dissolved in water. Magnesium hydroxide will form. Put a red litmus paper in that solution. It turns in to blue. So we know that it is a base.

(ii) Burn a small amount of sulphur on fire. Collect the smoke in a test tube. It is sulphur dioxide. Make the gas to be dissolved in water. Sulphur dioxide will form. Put a blue litmus paper in that solution. It turns in to red. So we know that it is an acid.

### 14. How do you appreciate wide range utility of aluminium right from utensils to space craft?

A. The physical properties of aluminium made it a very important material used in various situations.

(i) As aluminium is a cheap metal, the utensils are made with aluminium.

(ii) As it a good malleable metal, used to make thin foils to pack chocolates, food items.

(iii) As it is a good conductor of heat and electricity, used in electrical wires, cables.

(iv) As it has luster, used in silvery white paints.

(iv) As it is light weight and strong, used in manufacturing of spare parts of aeroplane, space crafts.

So I appreciate the role of aluminium for its wide range of utility.

### 15. How is malleability of metals used in our daily life?

A. Malleability of metals used in our daily life:

(i) A thin foil of silver used to decorate sweets.

(ii) A thin foils of aluminium are used to pack food packets.

(iii) A black smith beats an hot iron rod and make agricultural instruments like chisel

(iv) A gold smith beats gold or silver and make ornaments.

### 16. Dumping of waste material made up of metals and non-metals leads to environment pollution. Do you support the statement? Give your justification with suitable examples.

A. All materials made up of either metals or non metals. So the waste material of metals and non metals leads to environment pollution.

(i) The oxides of carbon, sulphur (non metals) causes air pollution.

(ii) The oxides of lead, cadmium, mercury (metals) causes air pollution and water pollution.

(iii) Excess of nitrates, sulphides (non metals) causes earth pollution.

(iv) Excess of calcium, zinc (metals) in soil may effect the crops.