

# SANJEEVANI PUBLIC SCHOOL

## SCIENCE ASSIGNMENT (III)

### CLASS VIII

#### CH: 4

#### MATERIALS : METALS AND NON-METALS

##### I.MCQ:

- Metals react with oxygen to form their oxides which are generally :  
(a) Neutral in nature (b) acidic in nature (c) basic in nature (d) none of these  
**Ans.** Basic in nature
- Which of the following statement is correct ?  
(a) All metals are ductile (b) all non metals are ductile (c) metals are generally ductile (d) Non-metals are generally ductile  
**Ans.** Metals are generally ductile
- Which of the following is malleable?  
(a) Carbon (b) Phosphorus (c) Sulphur (d) Aluminium  
**Ans.** Aluminium
- Phosphorus is a non metal .When burnt in air,it forms dense white fumes which dissolve in water to form an acid .The acid so formed is:  
(a) hydrophosphorus acid (b) phosphorus acid (c) phosphoric acid (d) none of these  
**Ans.** Phosphoric acid
- Gold, silver, copper zinc, etc., are placed in the category of:  
(a) Metals (b) Non-metals (c) Metalloids (d) None of these  
**Ans.** Metals
- Oxygen, hydrogen, carbon, sulphur, phosphorous acid etc., are placed in the category of:  
(a) Metals (b) Non-metals (c) Metalloids (d) All of these  
**Ans.** Non-metals
- Some elements neither fit with the metals nor with non –metals, they are called:  
(a) Metalloids (b) Mixtures (c) Compounds (d) All of these  
**Ans.** Metalloids
- Boron, silicon, germanium, etc., are the examples of:  
(a) Metals (b) Non-metals (c) Metalloids (d) None of these  
**Ans.** Metalloids
- The property of metals by which they can be beaten to sheets, is :  
(a) Density (b) Lustre (c) Ductility (d) Malleability  
**Ans.** Malleability
- Substances (metals) conduct heat and electricity because of the property of:  
(a) Ductility (b) Conductivity (c) Malleability (d) Tensile strength  
**Ans.** Conductivity

##### II. Fill in the blanks :

- Melting point of most of the metals are higher than non-metals.
- Generally non-metals have no lustre.
- Metals are generally harder than non-metals.
- The property which allows metals to be hammered into sheets is malleability.
- The property which allows metals to be drawn into wires is ductility.
- Phosphorus is a very reactive non-metal.
- Metals are good conductors of heat and electricity.
- Zinc is a more reactive metal than copper.
- Metals react with dilute acids to produce hydrogen gas.
- Copper displaces silver from silver nitrate solution.

##### III. Statements given below are incorrect. Write the correct statements:

1. During a chemical displacement reaction, a less reactive metal displaces a more reactive metal from its salt solution.

**Ans.** During a chemical displacement reaction, a **more** reactive metal displaces a **less** reactive metal from its salt solution.

2. Gallium metal is a solid state at room temperature.

**Ans.** Gallium metal is a liquid state at room temperature.

3. The oxide formed by the chemical reaction of hydrogen and oxygen is acidic in nature.

**Ans.** The oxide formed by the chemical reaction of hydrogen and oxygen is neutral in nature.

4. Copper metal is more reactive than zinc metal.

**Ans.** Copper metal is a **less** reactive than zinc metal.

5. Metals always form acidic oxides.

**Ans.** Metals always form basic oxides.

**IV. Write true or false against the statements given below:**

1. Zinc is highly ductile in nature. (False)
2. Gold is highly malleable in nature. (True)
3. Sodium metal is lighter than water. (True)
4. Water is an example of a basic oxide. (False)
5. The reaction between iron and copper sulphate is displacement reaction. (True)
6. Copper reacts with dilute sulphate acid to form copper sulphate solution and hydrogen gas. (False)

**V. Match the statements in column A with those in column B.**

Column A	Column B
1. An allotrope of carbon which is as tensile as steel	Graphite (2)
2. An allotrope of carbon which has lustre.	Carbon fibre (1)
3. A metal which is in the liquid state at room temperature.	Tungsten (4)
4. A metal which is a poor conductor of electricity.	Mercury (3)
5. An oxide of a non-metal which dissolves in water.	Basic oxide (6)
6. An oxide of a metal which reacts with acid to form salt and water.	Acidic oxide (5)

**VI. Answer the following question :**

1. State four differences between metals and non metals.

**Ans :**

Metals	Non metals
1. Metals are generally solid at room temperature except mercury and gallium which are liquid at room temperature	Non metals may be solids, liquids or gases
2. Metals are sonorous	Non metals are not sonorous
3. Metals are malleable	Non metals are not malleable
4. Metals are ductile in nature	Non metals are not ductile in nature

2. Wires cannot be drawn from materials such as stone or wood. Why ?

**Ans.** Wires cannot be drawn from materials such as stone or wood because stones or wood are not ductile in nature.

3. (a) What do you understand by the term metal activity series ?

**Ans.** Metals arranged in the form of table in the order of their decreasing chemical activity is called metal activity series.

- (b) Which metal amongst the following can displace hydrogen from acids ?

(i) Copper (ii) zinc (iii) magnesium (iv) silver

**Ans.** Zinc and magnesium can displace hydrogen from acids.

**4.** Describe all that you observe when a piece of sodium is dropped in water.

**Ans.** When a piece of sodium dropped in water, following observation can be seen.

(i) Sodium floats on the surface on water.

(ii) Sodium darts about in the various directions on the surface of water giving out tiny bubbles of a colourless gas

(iii) Sodium metal gradually decreases in size and finally disappears.

(iv) The water becomes warm and is soapy to touch.

**5. (a)** What kind of oxide is formed when carbon is burnt in air or oxygen?

**Ans.** It forms acid oxide, i.e., carbon dioxide gas.

(b) What product is formed when the above oxide is dissolved in water?

**Ans.** Carbon dioxide on dissolving water forms carbon acid.

**6. (a)** Describe all that you observe when a piece of iron is placed in copper sulphate solution for a few minutes.

**Ans. (i)** A reddish brown layer of copper deposits on iron.

(ii) The colour of copper sulphate solution fades.

(iii) The reaction mixture gets slightly warm.

(b) Chemical displacement reaction takes place.

**7.** Write equations for the following reactions.

(a) Aluminium and dilute hydrochloric acid.

(b) Zinc and sodium hydroxide solution.

(c) Sulphur and concentrated nitric acid.

(d) Sulphur dioxide gas and water.

(e) Heated iron and steam.

**Ans. (a)**  $2\text{Al} + 6\text{HCl (dil)} \rightarrow 2\text{AlCl}_3 + 3\text{H}_2(\text{g})$

(b)  $\text{Zn} + 2\text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2(\text{g})$

(c)  $\text{S} + 6\text{HNO}_3 \rightarrow 6\text{NO}_2 + \text{H}_2\text{SO}_4 + 2\text{H}_2\text{O}$

(d)  $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$

(e)  $3\text{Fe} + 4\text{H}_2\text{O} \leftrightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$

**8.** Why are sodium and petrol stored under kerosene oil?

**Ans.** It is because they are highly reactive metals. They catch fire in air or water. So They are kept under kerosene oil.

**9.** Why can copper not displace iron from iron sulphate solution?

**Ans.** It is because the position of copper is lower in metal activity series compared to iron in iron sulphate. Thus, no chemical displacement reaction is possible.

**10.** Why is the coil of heating element of heater made from a metal?

**Ans.** The heating coil of heater is made of an alloy of chromium, nickel and iron. This alloy conducts electricity, yet offers good amount of resistance to the electric current. Due to these properties the coil of heating element gets red hot on the passage of electric current.

**11.** Why are aluminium foils used for packaging?

**Ans.** Aluminium is highly ductile metal, which is not very expensive and does not react easily with organic acids present in the food material. Thus, its foil is ideal for food packaging.

**12.** Why are pickles not stored in an aluminium can?

**Ans.** On p

**13.** Iron nails are placed in copper sulphate solution for two hours. State your observations and write word equation in support of your answer.

**Ans. (i)** The iron nails are covered with reddish brown deposit.

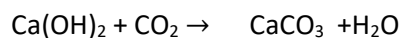
(ii) The colour of copper sulphate fades and changes to greenish blue colour.

(iii) The reaction mixture becomes warm

$\text{CuSO}_4 + \text{Fe} \rightarrow \text{FeSO}_4 + \text{Cu}.$

**14.** A boy introduced a red hot charcoal into a gas jar and covered it with a glass lid so as to collect the gas evolved. Explain:

**Ans.** (a) To the above gas the boy will add lime water (a few drops) and shake well. If the lime water turns milky the gas is Carbon dioxide and is acidic in nature.



**15.** When the gold ornaments are sent to a jeweller for polishing, they always lose small amount of weight. Explain how does this happen.

**Ans.** Gold ornaments are not made of the pure gold but contain 8 % to 16% of copper. During polishing the first step is to immerse ornaments in acid solution. The acid solution dissolves some amount of copper. This results in the loss weight.