

Exercises

(A). Fill in the blanks: (Ans.)

- 1) platinum
- 2) Zinc
- 3) Sodium, Calcium, Aluminium & Magnesium metals
- 4) sodium
- 5) Hydrogen gas

(B). Pick the correct option:

- 1) malleability
- 2) Sodium
- 3) Iodine
- 4) Phosphorus pentoxide
- 5) Iron rod
- 6) Both acid and base

(C). True or false :

- 1) True
- 2) False
- 3) True
- 4) False
- 5) True

(D). Answer in detail :

1) Name of 3 Metals and their chief minerals are:

Name of Metals.	Name of Mineral
a) Iron	Haematite, Magnetite, Siderite,
b) Aluminium.	Bauxite, cryolite
c) Copper	Cuprite, Copper Pyrite, Copper Glance

2) Three properties of non-metals are :

- a) Malleability : Non- metals are non-malleable. As solids, they are brittle i.e. they break or shatter on hammering. For example: coal, sulphur, phosphorus are brittle.
- b) Lustre : Non-metals do not have lustre. They do not reflect light from their surface. They have dull appearance. sulphur phosphorus and carbon show this property.
- c) Hardness : They are usually not hard and soft. For example: coal, Sulphur and phosphorus are soft but diamond is an exception of this as it is the hardest substance known to us.

3) Physical state of metals : They are solid at room temperature. For example: sodium, aluminium potassium, magnesium, Mercury and Gallium metals are exception because they occur in liquid state at room temperature.

Physical state of non- metals : They can exist in solid liquid or gaseous state at room temperature. For example: carbon, sulphur, phosphorus, iodine are in solid state, bromine is in liquid state while oxygen nitrogen, chlorine are in gaseous state at room temperature.

4) Electrical conductivity : Property because of which an element can conduct electric current is known as electrical conductivity.

Electrical conductivity in metals : Generally, metals are good conductors of electricity because they have free electrons. Silver and copper are the two best conductor. Relatively, lead and Bismuth are poor conductors of electricity.

Electrical conductivity of non- metals : They are usually poor conductors of electricity. However, carbon

in the form of graphite is exception. This form of carbon is good conductors of electricity because it has one free electron which is involved in transfer of electric current.

5) The temperature at which substance begins melting is called melting point & the temperature at which substance starts boiling is called its boiling point.

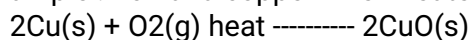
6) Density : The mass of a unit volume of a substance is called its density.

- Metals generally have high density and they are heavy. Iridium and osmium have the highest densities while lithium has the lowest density.
- Non-Metals which are gases have low density. Solid non-metals have low to moderate density. They are medium light. For example: sulphur phosphorus and boron. However, diamond has high density.

7) The reaction of the Metals with oxygen, dilute acid and water are :

a) Generally, metals react with oxygen to form oxides. Metal oxides are basic in nature.

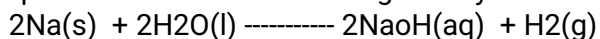
For example : iron and copper when heated at high temperature form oxides.



Copper. Oxygen. Copper oxide

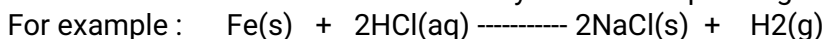
b) Metals generally react with water to form oxides or hydroxides and hydrogen gas is released.

For example : sodium metal reacts vigorously with water giving off a lot of heat.



Sodium Water Sodium hydroxide Hydrogen

c) When metals react with dilute acids they form corresponding salts and liberate hydrogen gas.

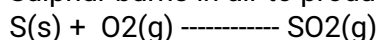


Iron. Hydrochloric acid. Sodium chloride. Hydrogen

The reaction of the non-metal with oxygen dilute acid and water are :

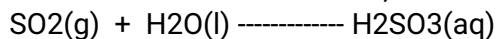
a) Non- metals react and combine with oxygen to form non metal oxides that are acidic in nature.

For example : Sulphur burns in air to produce Sulphur dioxide.



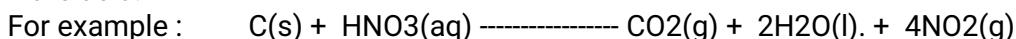
Sulphur Oxygen. Sulphur dioxide

b) When Sulphur dioxide is dissolved in water, it forms sulphurous acid.



Sulphur dioxide Water. Sulphurous acid

c) Non-metals usually do not react with dilute acids. Such as carbon, Sulphur and phosphorus reacts with nitric acid.

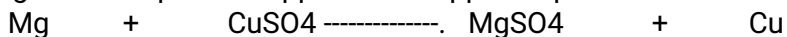


Carbon Nitric acid. (Carbon dioxide) (Water)(Nitrogen dioxide)

8) Displacement reaction : The reaction in which one metal replaces another from its salt solution is known as displacement reaction.

For example : A more reactive metal replaces a less reactive metal from its salt solution. This means a metal can replace only those metals which are placed below it in the reactivity series.

Magnesium replaces copper from copper sulphate solution to form magnesium sulphate and copper.



(Magnesium)(Copper sulphate). (Magnesium sulphate) (Copper)

9) The most common methods for prevention of corrosion are :

- Applying paint or oil
- Covering with another metal
- Galvanising
- Electroplating
- Anodising
- Alloying

.Applying paint or oil : Applying Paint on the surface after cleaning it thoroughly is the most common method used to prevent corrosion of metals. Paints have oil base in their composition. Thus, applied paint does not allow the moisture and their to come in contact with the metal surface.

For example : In homes, metal doors and windows are painted to prevent corrosion. Applying grease or oil will also have the similar effect.

10). Uses of metals :

a) Aluminium :

- 1) It is widely used for making aeroplanes and automobile engines.
- 2) It is also used in packaging like cans, foil etc.
- 3) Powdered aluminium is used in Paint to prevent rusting of iron.

b) Copper :

- 1) It is used in making heating utensils, car radiators and calorimeters.
- 2) It is used in construction of cars, trains, lorries, etc.
- 3) It is used in making some medicines as it has antimicrobial activity.

Uses of Non-Metals :

a) Graphite :

- 1) The major use of graphite is in making lead of pencils.
- 2) It is also used as a dry lubricant in heavy machinery.
- 3) It is also used as an electrode.

b) Hydrogen :

- 1) It is widely used for the manufacture of the ammonia gas and fertilizers such as urea.
- 2) It is used for extraction of metals such as copper, lead and tin.
- 3) It is used for welding metals.

11). Physical properties of the Metals and Non-Metals are :

Metals :

- 1) Good conductors of heat and electricity.
- 2) Malleable- can be beaten into thin sheets.
- 3) Ductile- can be stretched into wires.

Non-Metals :

- 1) poor conductors of heat and electricity except graphite. Brittle- if it is a solid non- ductile. Do not possess metallic lustre.
- 2) Neither malleable nor ductile even solid state.
- 3) solids, liquids or gases at room temperature.

Chemical properties of the Metals and Non-Metals are :

Metals :

- 1) Form oxides that are basic.
- 2) React with water to form oxides or hydroxides and release hydrogen gas.
- 3) Usually react with acid to give metal salt and hydrogen gas.

Non-Metals :

- 1) Form oxides that are acidic.
- 2) Compounds of non metals such as chlorine Sulphur and nitrogen are used to make mineral acids like hydrochloric acid and sulphuric acid.
- 3) Non- metals usually do not react with acids.

Hots : (Ans.)

- 1) The bell is generally made out of brass. The reason that bells are made of metals is that metals are sonorous. Hence, metals can make the deep ringing sound.
- 2) Because when aluminium is expose to air frequently, it reacts with the oxygen present in the air and forms aluminium oxide. Due to the formation of aluminium oxide the lustre and shine of the vessel diminishes.
- 3) This is because when silver is exposed to air, it reacts with sulphur compounds in the air. This reaction with sulphur compounds in the air that cause the silver to tarnish and not the reaction with

oxygen.

- 4) Metals get corrode because they when in contact with the atmosphere, they start reaction with free oxygen in presence of moisture..... It's simply mean that oxidation of metal.

(Questions from NCERT for practice)(Ans.)

(A). Zinc

(B). Generally, metals are ductile.

(C) Fill in the blanks :

- 1) reactive
- 2) good and electricity
- 3) more
- 4) hydrogen gas

(D). Write true or false :

- 1) false
- 2) true
- 3) false
- 4) false

(E). Give reasons for the following :

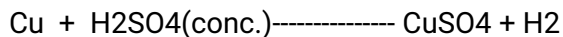
- 1) Aluminium is malleable and can be drawn into thin sheets. Hence, aluminium foils are used to wrap food items.
- 2) Immersion rods for heating liquids are made up of metallic substances because metals are good conductors of heat and electricity.
- 3) Copper cannot displace zinc from its salt solution because zinc is more reactive than copper.
- 4) Sodium and potassium are highly reactive metals which readily reacts with atmosphere oxygen to catch fire. Hence,sodium and potassium are stored in kerosene.

(F). Pickle consists of acids react with aluminium metal to produce salt and hydrogen. Hence, pickle is not stored in aluminium utensil.

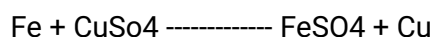
(G). What happens when :

- 1) No reaction occurs when dilute sulphuric acid is poured on a copper plate. However, when concentrated sulphuric acid is poured on a copper plate, hydrogen gas evolves along with the formation of blue coloured copper sulphate crystals.

The chemical reaction for the the reaction between concentrated sulphuric acid and copper is :

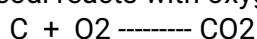


- 2) Iron being more reactive displaces copper from copper sulphate. In this reaction, the blue colour of copper sulphate fades and there is a deposition of copper on the iron nail.



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

- 1) In a test tube containing gas, add a few drops of water. Now cover the test tube and shake well. After shaking, test the solution with blue litmus. It will change from blue to red. Thus, gas is acidic in nature.
- 2) Charcoal reacts with oxygen to form carbon dioxide gas.



Carbon Oxygen Carbon dioxide

