

C-8 SCIENCE WK-6

CHAPTER-4

METALS AND NON-METALS

On the basis of their general properties, elements are divided into METALS AND NONMETALS.

METALS (physical properties)

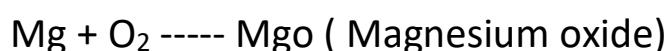
- They are generally strong, hard solids. For e.g., aluminium, iron, zinc, tin, copper etc.
- They are lustrous. E.g., silver, gold etc.
- Metals are sonorous.
- Metals are malleable and ductile i.e. they can be beaten into thin sheets and drawn into wires. E.g., silver foil used to decorate sweets and aluminium foil used to pack foodstuff
- They are good conductors of heat and electricity. Silver (Ag) is the best conductor of electricity; the next is Cu (copper) and then Aluminium (Al).

CHEMICAL PROPERTIES

- Reaction of metals with oxygen

Metals like potassium (K) and sodium (Na) placed high up in the reactivity series, are so active that they react very fast with air forming oxides. So K and Na are stored under kerosene.

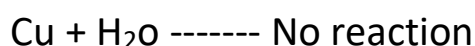
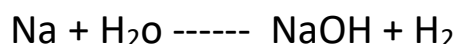
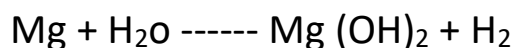
All metals react with oxygen to form metal oxides.



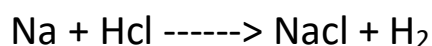
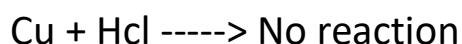
Metals are basic in nature, they turn red litmus blue. Some are amphoteric i.e. acidic as well as basic.

- Reaction of metals with water

Metals react with water to form metal hydroxide.

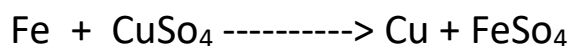


Reaction of metals with dilute acids



Displacement of one metal by another

A more active metal displaces a less active metal from compounds of the latter in solution. For e.g., aluminium and iron displace copper from a solution of copper sulphate.



PHYSICAL PROPERTIES OF NONMETALS

Nonmetals are bad conductors of heat and electricity.

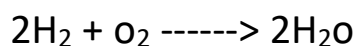
They are brittle, nonsonorous.

They are lustreless, except graphite and iodine.

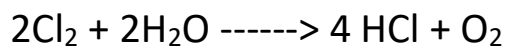
Of the 24 nonmetals known, 12 are solids, 1 is a liquid (bromine) and 11 are gases (H_2 , N_2 , O_2) etc.

CHEMICAL PROPERTIES OF NONMETALS

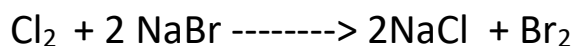
ACTION OF AIR



ACTION OF WATER



DISPLACEMENT OF ONE NONMETAL BY ANOTHER FROM A SALT SOLUTION



Sodium bromide Sodium chloride bromine

Generally, acids and bases do not act on nonmetals under ordinary conditions.

NOTE- SCA- 1) FLOW CHART OF BASIC AGRICULTURAL PRACTICES.

2) CHEMICAL PROPERTIES OF METALS AND NON METALS ALONG WITH REACTIONS.

HOMEWORK- PREPARE FOR ASSESMENT.COMPLETE THE COPY ALONG WITH THE DIAGRAMS.

STAY HOME,STAY BLESSED.

Exercises

Question 1:

Which of the following can be beaten into thin sheets?

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

Answer 1:

- (a) Zinc

As Zinc is a metal and metal has property of malleability (Can be converted in sheet by beating). Rest of these are non-metals.

Question 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.

Answer 2:

- (c) Generally, metals are ductile.

Mercury (metal) is liquid at room temperature and cannot be drawn into wires. Therefore, it is non-ductile. So the option (a) is incorrect. Not a single non-metal is ductile, so option (b) and (d) are incorrect.

Question 3:

Fill in the blanks:

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

Answer 3:

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

Question 4:

Mark 'T' if the statement is true and 'F' if it is false

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

Answer 4:

- (a) Generally, non-metals react with acids. (F)
Generally, metals react with acids and release H₂ gas.
- (b) Sodium is a very reactive metal. (T)
Sodium, Potassium, Calcium etc., are very reactive metals.
- (c) Copper displaces zinc from zinc sulphate solution. (F)
*The reactivity of zinc is higher than copper.
So, copper cannot displace zinc from zinc sulphate solution.*
- (d) Coal can be drawn into wires. (F)
Coal is a non-metal, so it is non ductile.

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