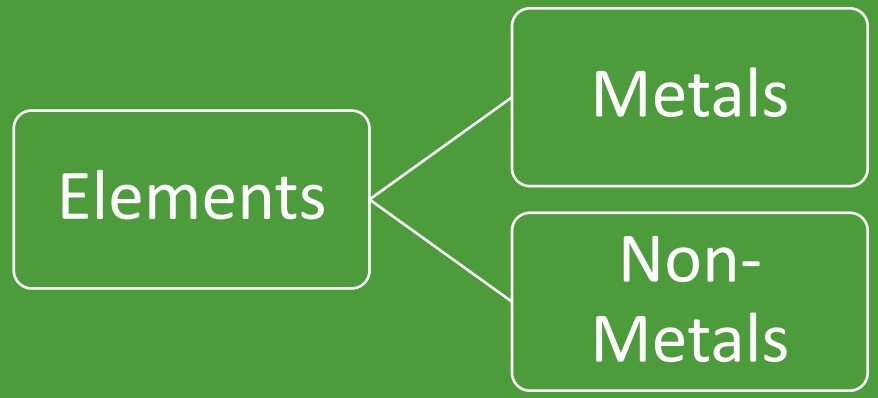
CLASS 10- SCIENCE

CHAPTER 3- METALS AND NON-METALS

PART 1- PHYSICAL PROPERTIES OF METALS

INTRODUCTION

There are 118 elements known to us, out of which many are used in our day to day life. These elements can be classified into two main groups depending upon their physical and chemical properties.



Generally, all the metals exhibit similar properties and all the non-metals show similar properties, but this is not always true, as there are many exceptions in almost all the properties of metals and non-metals.

INTRODUCTION (cont.)

Metals-

- Most abundant metal in the earth's crust- Aluminium
- Second most abundant metal in the earth's crust- Iron
- Other important metals available- Calcium, Sodium, Potassium, Magnesium, Gold, Silver, Tin, Lead etc.

Non-metals

- Most abundant non-metal in the earth's crust- Oxygen
- Second most abundant non-metal in the earth's crust- Silicon
- Other important non-metals available- Phosphorus, Sulphur, Nitrogen, Hydrogen, Carbon, Chlorine, Helium, Neon, Argon etc.

PHYSICAL PROPERTIES OF METALS

1) Metals are malleable i.e. they can be beaten into thin sheets.

Examples- gold, silver, iron, aluminium, copper

Exceptions- zinc, arsenic, mercury, antimony

2) Metals are ductile i.e. they can be drawn into thin wires.

Examples- gold, silver, copper, aluminium, iron, magnesium and tungsten

Exceptions- zinc, arsenic, mercury, antimony

PHYSICAL PROPERTIES OF METALS (cont.)

3) Metals are good conductors of heat i.e. they allow heat to pass through them easily.

Examples- silver, copper, aluminium

Exceptions- lead, mercury

4) Metals are good conductors of electricity i.e. they allow electricity or electric current to pass through them easily.

Examples- silver, copper, gold, aluminium and tungsten

Exceptions- iron, lead, mercury, bismuth, tungsten

PHYSICAL PROPERTIES OF METALS (cont.)

5) Metals are solid at room temperature.

Examples- iron, copper, aluminium, gold, silver

Exceptions- mercury is the only metal which is in liquid state at room temperature

6) Metals are strong. They have high tensile strength and can hold large weights without getting damaged.

Examples- iron, copper etc.

Exceptions- sodium and potassium are soft metals

PHYSICAL PROPERTIES OF METALS (cont.)

7) Metals are hard, but are not equally hard as the hardness varies from metal to metal.

Examples- iron, copper, aluminium etc. are very hard

Exceptions- alkali metals like lithium, sodium and potassium are soft and can be cut with a knife

8) Metals are sonorous i.e. they make sound when hit with an object.

Examples- iron, copper, aluminium, silver, tin

Exceptions- mercury

PHYSICAL PROPERTIES OF METALS (cont.)

9) Metals are lustrous i.e. they have a shining surface.

Examples- gold, silver, copper are shiny metals and can be polished

Exceptions- sodium, lead

10) Metals have high melting and boiling points i.e. the solid metals are turned into their liquid state by heating to a very high temperature.

Examples- iron, copper etc.

Exceptions- metals like sodium, potassium, gallium and cesium have low melting points

PHYSICAL PROPERTIES OF METALS (cont.)

11) Metals have high density i.e. they are heavy substances.

Examples- Iron

Exceptions- Alkali metals like lithium, sodium and potassium have low densities.

12) Metals are usually silver or grey in colour.

Exceptions- Copper with reddish brown colour and gold with yellow colour are exceptions.

THANK YOU