



Class VIII

METALS and NON Metals

Metals are elements that have a tendency to lose electrons and form positive ions. (They are electropositive)

Metals generally show the following properties

- 1) They are hard. They are mostly solid at room temperature. Mercury is an exception-it is a metal and is liquid at room temperature
- 2) Malleability - Metals can be beaten into thin sheets. This property of being able to be beaten into thin sheets is known as malleability. Gold is the most malleable metal. Due to its malleability, we can obtain thin sheets of iron, or aluminium and also foils of aluminium or silver
- 3) Ductility – It is the property of metals to be able to be drawn into thin wires. Thus metals are ductile. Due to their ductility, we can use metals in making electrical wires or gold and silver in jewellery. Gold is the most ductile.
- 4) Conductivity: It is that property of metals which allows the current and heat to pass through them easily. Example- Metals like iron rod, nail, copper wire, etc. are good conductors of electricity.
- 5) Lustre – metals are lustrous. Metals have a shiny appearance. This shiny appearance can become dull when



a metal is exposed to air and moisture, due to deposit of oxide, carbonate or sulphide.

The lustrous property of gold makes it an attractive metal for jewellery

6) Sonorous- Metals produce a ringing sound when they are struck hard. This is known as sonorous property.

Non -Metals:

Those materials which do not possess the characteristics of metals are termed as non-metal.

- Materials like coal and sulphur are soft and dull in appearance.
- They break down into powdery mass on tapping with hammer.
- They are non-sonorous and are poor conductors of heat and electricity.

Few examples of non metals are sulphur, carbon, oxygen etc.

We can say that some materials are hard, lustrous, malleable, ductile, sonorous and good conductors of heat and electricity. The materials which generally possess these properties are called metals. The examples of metals are iron, copper, aluminium, calcium, magnesium, etc.

Materials like coal and sulphur are soft and dull in appearance. They break down into a powdery mass on tapping with a hammer. They are not sonorous and are poor conductors of heat and electricity. These materials are called



non-metals. The examples of non-metals are sulphur, carbon, oxygen, phosphorus, etc

Q) What are some common exception to the genral physical properties of metals

Ans:

- a) Metals like sodium and potassium are soft and can be cut with a knife.
- b) Mercury is the only metal which is found in liquid state at room temperature.
- c) Metals have high melting points but gallium and caesium have very low melting points. These two metals will melt if you keep them on your palm.

Q) What do you understand by rusting of iron?

Corrosion of iron is called **rusting**. **Rusting** is a process in which **iron** metal reacts with moist air (water + oxygen) present in the atmosphere to form **iron** oxide, Fe_2O_3 , which is reddish brown in colour. **Rusting of iron** leads to very heavy damage to the substance.

Q) Complete the following reactions of iron and magnesium with oxygen.

Iron (Fe) + Oxygen (O_2) + Water (H_2O) \rightarrow ?

Magnesium (Mg) + Oxygen (O_2) \rightarrow ?

Ans: In both the cases, oxides are formed Fe_2O_3 and MgO

To check the nature of rust formed as a result of the reaction between iron, oxygen and water.



Collect a spoonful of rust and dissolve it in a very little amount of water.

Shake the suspension well.

Test the solution with red and blue litmus papers

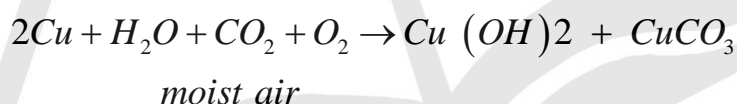
Observation: It turns red litmus blue

Conclusion: The rust – oxide of iron is basic in nature

Q) Why do we see a greenish deposit on the surface of copper vessels and a black deposit on the surface of silver articles

Ans: When articles of copper and silver are exposed to air and moisture, there is formation of carbonates and sulphides on their surfaces due to which we see greenish and black appearance

When a copper vessel is exposed to moist air for long, it acquires a dull green coating. The green material is a mixture of copper hydroxide ($\text{Cu}(\text{OH})_2$) and copper carbonate (CuCO_3). The following is the reaction



Q) How can we test the chemical nature of oxide of magnesium

Ans: The ash obtained on burning magnesium ribbon is dissolved in water and tested for its acidic/basic nature. We observe that it turns red litmus blue. Hence it is basic in nature

Q) What is the nature of oxide formed when a non metal reacts with oxygen?

Ans: Acidic



- We take a small amount of powdered sulphur in a deflagrating spoon and heat it.
- As soon as sulphur starts burning, introduce the spoon into a gas jar/ glass tumbler.
- Cover the tumbler with a lid to ensure that the gas produced does not escape.
- Remove the spoon after some time.
- Add a small quantity of water into the tumbler and quickly replace the lid. Shake the tumbler well.
- Check the solution with red and blue litmus papers

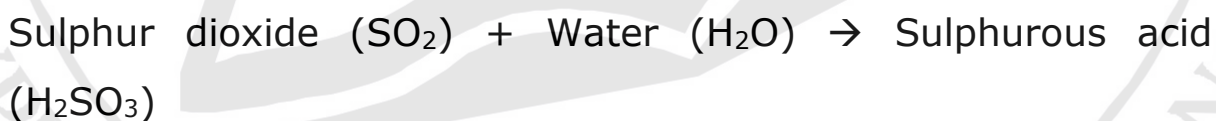
Observation : It turns blue litmus red

Conclusion: The oxide formed is acidic

Q) Name the product formed by the reaction of sulphur and oxygen.

Ans: The name of the product formed in the reaction of sulphur and oxygen is sulphur dioxide gas.

When sulphur dioxide is dissolved in water sulphurous acid is formed. The reaction can be given as follows:



The sulphurous acid turns blue litmus paper red.

Generally, oxides of non-metals are acidic in nature.