

Materials: Metals and Non-metals

Class 8 Notes

Introduction:

Each thing around us was categorized as **metal or nonmetal**. Hence, it is necessary to notice metals, and nonmetals, and how to transform them. In this lesson, we will learn the several physical and chemical properties of metals and non-metals.

Notes for Chapter 4 Materials: Metals and Non-metals Class 8 NCERT

Physical Properties of Metals:

Metals are materials that were

- **hard**
- **malleable**
- **sonorous**
- **lustrous**
- **good conductors of electricity and heat**

And also similar to **potassium** and **sodium** were soft and also can be cut with the help of a knife. **Mercury** is the only metal that is found in a liquid state.

Examples of Metals are:

- **Aluminum**

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- **Magnesium**
 - **Iron**
 - **Copper**
 - **Calcium**
 - **Gold, etc**

Physical Properties of Non-metals:

- They are low-paid conductors of **heat and electricity**.
- Take place as **liquids, solids, and gasses** at place temperature.
- Non-metals are soft (**For example coal**)
- They are **Non-sonorous**
- They are **Non-malleable**
- They are **Non-ductile**
- **Brittle** (the metal which breaks in the hammer)

Examples of Non-Metals are:

- **Chlorine**
- **Nitrogen**
- **Phosphorus**
- **Hydrogen**
- **Fluorine**
- **Carbon**
- **Selenium**

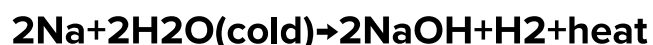
Chemical Properties of Metals and Non-metals:

Reaction Metal with Water:

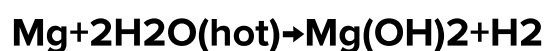
The metals will form **metal hydroxides** and **hydrogen gas** when it reacts with water.

Metal + Water → Metal hydroxide or Metal oxide + Hydrogen

i) Sodium is the high reactive metal sodium will react vigorously with cold water.



ii) Magnesium is the least reactive metal therefore it will react slowly with cold water but it will react vigorously with hot water.



iii) Metals such as zinc and iron were less reactive even with the steam water.



Reaction of Non-Metal with water :

Non- Metal + Water → No Reaction

Reaction with oxygen:

Metal Reaction with oxygen:

Both Metals and Non -Metals react with oxygen to form oxides.

Metal + Oxygen = Metal Oxide

Non- Metal + Oxygen = Non-Metal Oxide

Example for Metal: Magnesium + Oxygen = Magnesium Oxide

Example for Non Metal: Sulphur + Oxygen = Sulphur dioxide

Reaction with Bases:

To produce the **Hydrogen gas** Metal will react to the bases.

For Example: $Al + NaOH \rightarrow NaAlO_2 + H_2$

To produce the **salt** Non-metal will react to the bases.

For Example: $Cl_2 + 2NaOH \rightarrow NaCl + NaOCl + H_2O$

Reactivity Series:

Metals from high order to low order.

Symbol	Element
K	Potassium
Ba	Barium
Ca	Calcium
Na	Sodium
Mg	Magnesium

Al	Aluminum
Zn	Zinc
Fe	Iron
Ni	Nickel
Sn	Tin
Pb	Lead
H	Hydrogen
Cu	Copper
Hg	Mercury
Ag	Silver
Au	Gold
Pt	Platinum

Definitions:

Luster: The property of the metal by it shines.

Hardness: The property of the materials which makes it hard.

Malleability: The property of the materials which can be beaten into sheets.

Ductility: The property of the materials which can be drawn into wires.

Sonority: The property of the materials which produces a ringing sound when struck with a hard object.

Conduction of electricity: The property of the materials which allow the electricity to pass through it.

Conduction of heat: The property of the materials which allows it to transfer heat.