2017 Topic - Metal and Non Metal

Properties of Metals -

1. Hard and have high tensile strength. (Except → Na, K are soft)
2. Solid at room temprature. (Except Mercury (Hg) is liquid)
3. Good Conductor of heat and Electricity. Ag is best
4. Malleable i.e Can be beaten into thin sheets. Gold is highly malleable.
5. Ductile ie Can be drawn into thin wires. Gold is most ductile
6. High Melting and boiling point. (Except Cesium (Cs) and Galium (Ga))
7. They are lusturous
8. Sonorus (Ringing Sound)

Properties of Non-metal -

1. Non metals are solid, liquid and gas. Br is only Non metal found in liquid state.
2. Non metals are brittle ie Can be broken into thin pieces.
3. Non metals are non-malleable and non-ductile.
4. Non lusturous. (Except Iodine → Lusturous non Metal)
5. Bad Conductor of heat and electricity (Except Graphite)
6. Soft (Except - Diamond → Hardest natural)
7. Non Sonorus.

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Some Imp Chemical Properties of Metals -

1. Metal react with water and produce H_2 gas.

Metal + Water → Metal hydroxide + H_2

Ex $2Na + 2H_2O \rightarrow 2NaOH + H_2$

Note - Cu, Ag, Au never react with water or steam
↓ Silver ↘ Gold

2. Metal react with oxygen and form metal oxide.
Metal Oxide are basic.

Metal + O_2 ⟶ Metal oxide (~~Basic~~)

Ex- $2Mg + O_2 \longrightarrow 2MgO$ (Basic) MCQ
(Magnesium Oxide

2016

Amphoteric Oxide- Those oxide which show both acidic as well as Basic behaviour known as Amphoteric oxide.

Ex- Al_2O_3, ZnO

Note- Non metal oxides are acidic.

Reactivity Series -

A high reactive Metal displace least reactive metal from its Salt

K
Na
Ba
Mg
Al
Zn
Fe
Ni
Pb
H
Cu
Ag → Au → Pt

High Reactive
Decreasing Reactivity

Ex- ① $Fe + CuSO_4 \longrightarrow FeSO_4 + Cu$

② $Cu + FeSO_4 \rightarrow$ No Reaction

Displacement Rxn

Thermite Reaction- In this reaction Aluminium is reacted with Iron Oxide and Molten Iron is obtained. This reaction is used in welding of railway track, cracked machine parts.

Rxn $Al + Fe_2O_3 \longrightarrow Al_2O_3 + Fe$ (Molten)

Iron Oxide — Iron

Occurrence of Metals- Most of the elements (metals) occur in nature in the compound state. Some found in free state.

Minerals- All the compound in earth crust in which metal present are known as minerals.

Ores- The minerals from which metal can be extracted profitably and easily are known as ores.

Some Imp Metals and their Ores-

	Metal	Ores	Chemical formula
1.	Na	Common Salt	NaCl
2.	Al (Aluminium)	Bauxite	$Al_2O_3 \cdot 2H_2O$
3.	Fe (Iron)	Haematite	Fe_2O_3
		Iron Pyrite	FeS_2
		Magnetite	Fe_3O_4
4.	Cu (Copper)	Cuprite	Cu_2O
		Copper glance	Cu_2S

5. Ca (Calcium) — Limestone — $CaCO_3$

6. Zn (Zinc) — Zinc blende — ZnS; Calamine — $ZnCO_3$

7. Hg (Mercury) — Cinabar — HgS

Note- Gold (Au), Platinum (Pt) are the metals which found in free State.

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Some Imp process-

2015 **Roasting** - The process in which Sulphide Ore is heating strongly in the presence of air.

Ex- $2ZnS + 3O_2 \xrightarrow{Heat} 2ZnO + 2SO_2$
Zinc Sulphide

2014 **Calcination** - The process in which Carbonate Ore is heated in the absence of air.

Ex- $ZnCO_3 \xrightarrow{Heat} ZnO + CO_2$
(Zinc Carbonate)

2020 **Ques-** Why is Na (Sodium) kept immersed in kerosene oil?

Ans- Sodium is highly reactive metal and react with oxygen at room temprature so it kept immersed in kerosine oil.