METALS & NON-METALS

Class 10th

GUN SHOT

Learning Outcomes

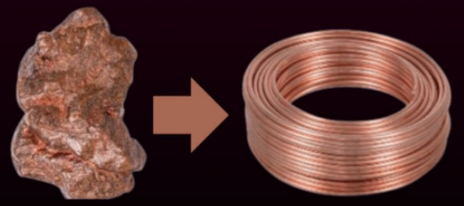
30+ PYQS

Physical & Chemical Properties Of Metals and Non Metals

How do Metals and Non Metals React Electrovalent Or Ionic Compound

Extraction Of Metals

Physical Properties

Metals	Non Metals
Lustrous: have shining surface (in pure state), Metallic Lustre 	Non-Lustrous
Generally Hard	Generally soft
Malleability: Property of substance that it can be beaten into thin sheets. [Gold & Silver Most Malleable] 	Non-malleable
Ductility: Ability of metals to be drawn into thin wires 1g of Gold metal → 2 km length of wire 	Non-ductile

Metals	Non Metals
Good conductor of Electricity. Best are silver, copper, gold. 	Poor conductor of Electricity
Good Conductor of Heat: Best are Silver Copper. 	Poor conductor of Heat
Have high Melting points	Low Melting point
Sonorous : Metals produce a sound on striking a hard surface. 	Non- sonorous
Physical state : All metals *except* *mercury* exist as solids at room temperature. → Liquid	Solid → Carbon, Sulphur Liquid → Bromine Gases → Nitrogen, Chlorine, Oxygen

Exceptions

METALS

1. Alkali metals - Li, Na, K are so soft that they can be cut with a knife. (also Ga & Cs)
2. Gallium (Ga) & Cesium (Cs) have low melting point. They melt if you keep them on your palm.
3. Lead & Mercury are poor conductors of Heat. (exist as liquid)
4. Lead (Pb) is a poor conductor of electricity.

NON-METALS

1. Iodine and Graphite are Lustrous
2. Diamond (form of Carbon) is the hardest natural substance. It has high melting & boiling point.
3. Graphite (form of Carbon) conducts electricity

Diamond

Iodine

Graphite

Q1. A metal and a non-metal that exists in liquid state at the room temperature are respectively

CBSE 2024 , CBSE 2020

A Bromine and Mercury

B Mercury and Iodine

C Mercury and Bromine

D Iodine and Mercury

Q2. Which one of the following metals is malleable and a poor conductor of electricity ?

CBSE 2023

A Copper

B Zinc

C Lead

D Silver

Copper and aluminium are used for making cooking vessels because -

1.They are good conductor of heat

2.They have high melting point (do not melt).

Gold and silver used for jewellery making because they are Lustrous, Malleable and Ductile & Corrosion resistant

Carbon is a non-metal that can exist in different forms. Each form is called an Allotrope.

Graphite

Coal

Diamond

Q3. (i)Write two properties of gold which make it the most suitable metal for ornaments.

(ii) Name two metals which are the best conductors of heat.

(iii) Name two metals which melts when you keep them on your palm.

(CBSE 2020)

(i) They are Malleable and Ductile

(ii) Silver and Copper

(iii) Gallium and Cesium

Chemical Properties

1) Metal + Oxygen ⟶ Metal Oxide

Generally basic in nature
(Turns Red Litimus Blue)

$4K + O_2 \longrightarrow 2K_2O$ + Heat

$4Na + O_2 \longrightarrow 2Na_2O$ + Heat

- K and Na react so vigorously with oxygen that *they catch fire (Burns in air)* even if kept in the open.
- They are kept inside kerosene oil to
  a. Protect them from burning in air
  b. Prevents accidental fires.

imp

$2Mg + O_2 \xrightarrow{Heat} 2MgO$
Ribbon → White powder

Mg ribbon burns with dazzling white light

$4Al + 3O_2 \xrightarrow{Heat} 2Al_2O_3$

Aluminium burns with a bright white flame.
Forms a protective oxide layer which prevents Aluminium from any further Oxidation.
(Zinc and Lead also)

$2Cu + O_2 \xrightarrow{Heat} 2CuO$
Red wire → Black Layer

Cu does not burn, (takes long time) & turns Black

NOTE : Gold and Silver DO NOT react with Oxygen even at high Temperature

Q4. Consider the following metals: **(CBSE 2025, 2020, 2016)**

K, Ca, Al, Cu, Ag, Fe

Select from the above metals, a metal which

I. does not react with oxygen even at high temperature. ⇒ Ag

II. reacts with oxygen at ordinary temperature and forms a protective oxide layer which prevents the metal from further oxidation. ⇒ Al

III. catches fire when kept in the open. ⇒ K

IV. does not burn in oxygen but the hot metal is coated with a black coloured oxide layer. ⇒ Cu

Q5. Why is potassium kept immersed in kerosene ? **(CBSE 2021)**

Ans - Potassium is highly reactive Metal. It react so vigorously with oxygen that they catch fire (Burns in air) even if kept in the open.
They are kept inside kerosene oil to
a. Protect them from burning in air
b. Prevents accidental fires.

$C + O_2 \rightarrow CO_2$ $S + O_2 \rightarrow SO_2$

Non Metal Generally gives Acidic Oxides when burnt in air

ex - Sulphur - SO_2

Carbon - CO_2

Flame Test

Element	Ion	Flame colour
Lithium	Li^+	Crimson
Sodium	Na^+	Yellow
Potassium	K^+	Lilac
Calcium	Ca^{2+}	Orange-red
Copper	Cu^{2+}	Green

- YELLOW SUN
- GREEN COP
- CAR ORANGE
- RED LIGHT
- PURPLE POTATO

Flame color for salts
- $CaCl_2$ → Orange-Red
- NaCl → Yellow

Amphoteric Oxide

Metal oxides are generally basic in nature.
Turns moist red litmus blue.
E.g; MgO, CuO, Na_2O, K_2O.

But, Some metal oxides show both acidic and basic nature like those of Aluminium & Zinc

$$\underset{\text{Base}}{Al_2O_3} + \underset{\text{Acid}}{6HCl} \longrightarrow \underset{\text{Salt}}{2AlCl_3} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\text{Acid}}{Al_2O_3} + \underset{\text{Base}}{2NaOH} \longrightarrow \underset{\text{Salt}}{2NaAlO_2} + \underset{\text{Water}}{H_2O}$$

Such metal oxides which react with both acids as well as bases to produce salts and water are known as Amphoteric oxides

Q6. What are amphoteric oxides? With the help of balanced chemical equations show that aluminium oxide is an amphoteric oxide.

(CBSE 2025,2024 ,2023,2020, 2016,)

ANS -Some metal oxides show both acidic and basic nature like Aluminium oxide and Zinc Oxide. Such metal oxides which react with both acids as well as bases to produce salts and water are known as Amphoteric oxides

$$\underset{\text{Base}}{Al_2O_3} + \underset{\text{Acid}}{6HCl} \longrightarrow \underset{\text{Salt}}{2AlCl_3} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\text{Acid}}{Al_2O_3} + \underset{\text{Base}}{2NaOH} \longrightarrow \underset{\text{Salt}}{2NaAlO_2} + \underset{\text{Water}}{H_2O}$$

Reactivity Series

K	Potassium	Kudi
Na	Sodium	Naal
Ca	Calcium	Car
Mg	Magneisum	Mango
Al	Aluminium	Alto
Zn	Zinc	Zisko
Fe	Iron	Fir
Pb	Lead	Lekar
H	Hydrogen	Hum
Cu	Copper	Chale
Hg	Mercury	Mathura
Ag	Silver	Saath
Au	Gold	Ghumne

Most reactive

Less reactive

2) Metal + Water → Metal Hydroxide / Oxide + H_2

Ca^{+2} OH^{-1}

K, Na, Ca — Cold water

$2K(s) + 2H_2O(l) \rightarrow 2KOH(aq) + H_2(g)$ → Heat

$2Na(s) + 2H_2O(l) \rightarrow 2NaOH(aq) + H_2(g)$ → FIRE

Mg — Hot Water

$Ca(s) + 2H_2O(l) \rightarrow Ca(OH)_2(aq) + H_2(g)$

$Mg(s) + 2H_2O(l) \rightarrow Mg(OH)_2(aq) + H_2(g)$ → Float

Al, Zn, Fe — Steam

$2Al(s) + 3H_2O(g) \rightarrow Al_2O_3(s) + 3H_2(g)$

$3Fe(s) + 4H_2O(g) \rightarrow Fe_3O_4(s) + 4H_2(g)$

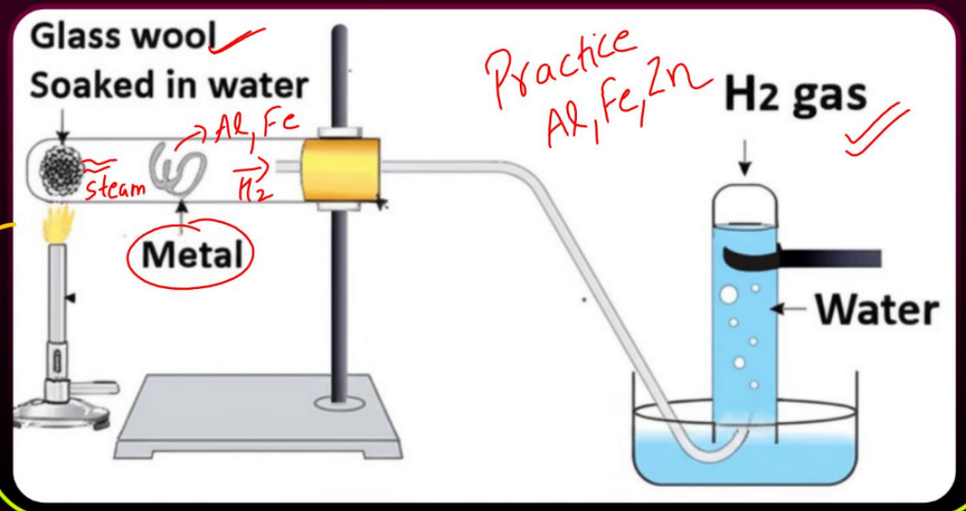
→ Steam

Pb, H, Cu, Hg, Ag, Au, Pt — Do not react with water

1. K,Na reacts violently with cold water. Reaction is highly exothermic. $H_2(g)$ evolved catches fire.

2. Ca has Less violent reaction .Do not catch fire.

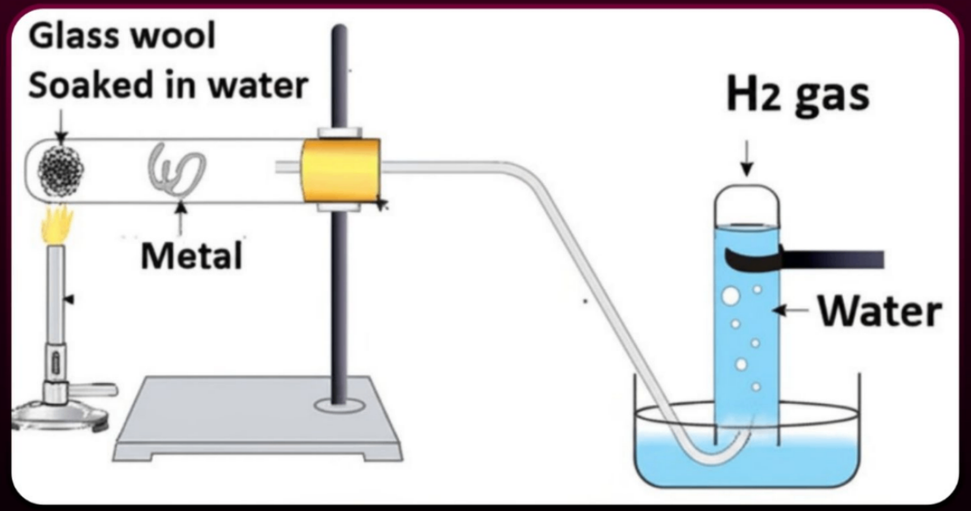
3. Ca and Mg float in water as bubbles of $H_2(g)$ stick to the surface of the metal.



Q7. A metal 'A' reacts violently with cold water and the gas evolved catches fire. Another metal 'B' when dipped in water starts floating. The metal 'C' does not react with cold or hot water, but reacts with steam. The metal 'D' does not react with water at all. Identify the metals 'A', 'B', 'C' and 'D'.

(CBSE 2023)

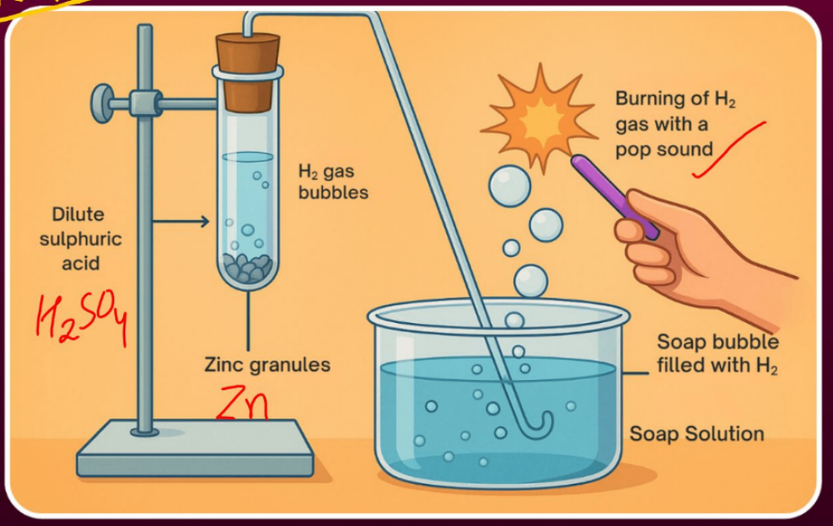
Q8. With the help of a labelled diagram show the experimental set up of action of steam on a metal.



(CBSE 2020)

3) Metal + Dil. Acid ⟶ Salt + H_2 (Reaction with Acids)

Displacement



$$Mg + 2HCl \rightarrow MgCl_2 + H_2(g)$$
Acid

$$2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2(g)$$
Acid

$$Zn + 2HCl \rightarrow ZnCl_2 + H_2(g)$$

+ Heat
Exothermic

$$Fe + 2HCl \rightarrow FeCl_2 + H_2(g)$$

$$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2(g)$$
Acid

K
Na
Ca
Mg
Al
Zn
Fe
Pb
H
Cu
Hg
Ag
Au

CH_3COOH ✓ HNO_3 X

$Cu + H_2SO_4 \longrightarrow$ X H_2

(CBSE 2024)

1. H_2 Gas Test -
   - Colorless gas
   - Burns with a pop sound
   - Extinguishes a burning candle
2. Exothermic reaction - More reactive metal → higher temperature
   Mg > Al > Zn > Fe
3. More reactive metal → higher rate of formation of H_2 (g) Bubble.
   Mg > Al > Zn > Fe

Special Case of Nitric Acid HNO_3

1. H_2 (g) is not evolved when a metal reacts with HNO_3 (nitric acid).
2. HNO_3 is strong oxidising agent. It oxidises the H_2 gas produced to water And Itself gets reduced to Nitrogen Oxides (NO, NO_2, N_2O)
3. Only Magnesium (Mg) & Manganese (Mn) reacts with very dil. HNO_3 to give H_2 (g).

imp

$$H_2 \xrightarrow[[O]]{HNO_3} H_2O \text{ (water)}$$

$HNO_3 \rightarrow NO / NO_2$

(CBSE 2024)

Aqua Regia

Freshly prepared mixture of concentrated Hydrochloric acid and concentrated Nitric acid in the ratio of 3:1.

(conc) HCl + (conc) HNO_3

3 : 1

- Dissolves Gold & Platinum
- Highly corrosive and fuming liquid

Q9. Assertion (A): Hydrogen gas is not evolved when a metal reacts with nitric acid.
Reason (R): Nitric acid is a strong reducing agent and reduces the hydrogen produced in the reaction to water.

(CBSE 2025, 2016)

A Both (A) and (R) are true and (R) is the correct explanation of (A)

B Both (A) and (R) are true but (R) is the not the correct explanation of (A)

C (A) is true, but (R) is false

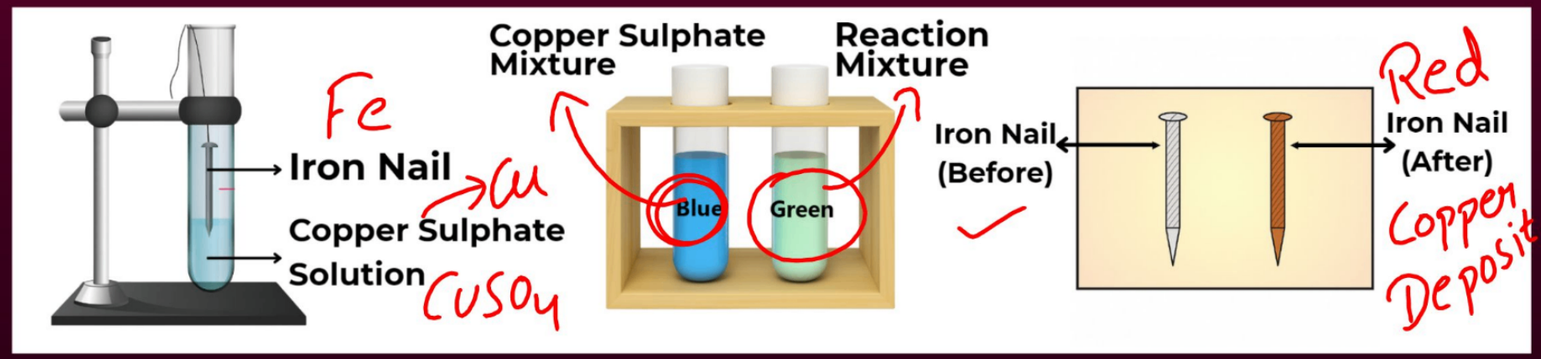
D (A) is false, but (R) is true

4) Displacement Reaction A + BC ⟶ AC + B

A is more reactive than B

K
Na
Ca
Mg
Al
Zn
Fe
Pb
H
Cu
Hg
Ag
Au

$Fe + CuSO_4 \longrightarrow FeSO_4 + Cu$
Blue → Green, Red/Brown



$Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$
Blue → Colourless, Red/Brown

$Zn + FeSO_4 \longrightarrow ZnSO_4 + Fe$
Green → Colourless, Grey

$Cu + ZnSO_4 \longrightarrow ?$ $CuSO_4 + Zn$ ✗

Best Method to check which metal is more reactive.

Q10. The colour of the solution observed after about 1 hour of placing iron nails in copper sulphate solution is

CBSE 2025, 2019

A Blue

B Pale green

C Yellow

D Reddish brown

Q11. A metal, M, displaces iron from aqueous solution of ferrous sulphate but fails to do so in case of aqueous solution of aluminium sulphate. The metal M is

CBSE 2025, 2018

A Magnesium

B Copper

C Lead

D Zinc

Thermit Reaction / Welding → Displacement

$$Fe_2O_3 + 2Al(s) \rightarrow Al_2O_3 + 2Fe(l) + Heat$$

The above reaction is so highly exothermic, that heat given out produces Iron Metal in Molten state.
This molten metal is used to join railway tracks or cracked machine parts.
This reaction is known as Thermit Reaction.

$$X \rightarrow Al + O_2 \longrightarrow Al_2O_3(Y)$$

K
Na
Ca
Mg
Al
Zn
Fe
Pb
H
Cu
Hg
Ag
Au
Pt

Q12. A metal 'X' is used in thermit process. When 'X' is heated with oxygen, it gives an oxide 'Y', which is amphoteric in nature. 'X' and 'Y' respectively are:

(CBSE 2025 ,2024,2023)

A. Mn, MnO_2
B. Al, Al_2O_3
C. Fe, Fe_2O_3
D. Mg, MgO

Q13. Aluminium powder is used in thermit welding because :

(CBSE 2025, 2024, 2023)

Fe X $Fe_2O_3 + Al$ → Fe(l)

A Its reaction with iron is highly exothermic.

B When it is heated with iron (III) oxide, molten iron is obtained.

C When it is heated with iron (III) oxide, molten aluminium oxide is obtained to join railway tracks.

D Its melting point is low as compared to iron and a molten alloy of iron and aluminium is formed on heating which is used to join railway tracks.

5) Electronic Configuration - Metals & Non Metals

Element	Atmoic no.	Electronic Configuration
Sodium (Na)	11	2, 8, 1 → Lose
Magnesium (Mg)	12	2, 8, 2 →
Calcium (Ca)	20	2, 8, 8, 2 →
Chlorine (Cl)	17	2, 8, 7 ← 1 Again
Oxygen (O)	8	2, 6 ← 2

Last Shell → 8e⁻ Complete octet

1/2/3 electron in Valence / Last shell

Metal lose electron to Complete Octet -Stable configuration

4/5/6/7 electron in Valence / Last shell

Non-Metal gain electron to Complete Octet -Stable configuration

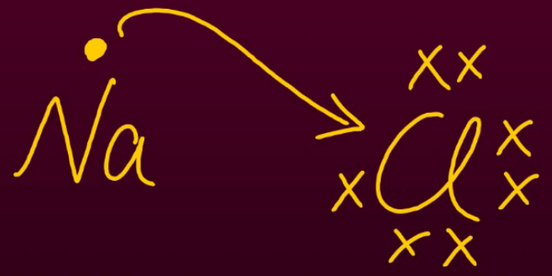
Formation of Sodium Chloride (NaCl)

M ↓ NM

$Na^+ \equiv Cl^-$

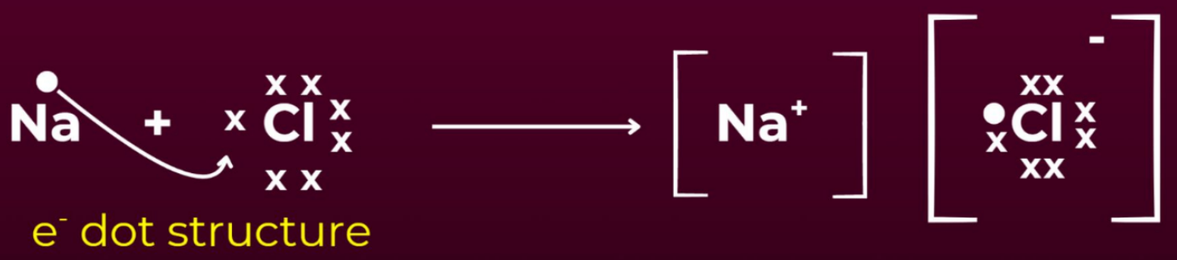
Na (11) ⟶ 2, 8, 1

Cl (17) ⟶ 2, 8, 7



$Na \longrightarrow Na^+ + e^-$ (Sodium cation)

$Cl + e^- \longrightarrow Cl^-$ (Chloride anion)



e^- dot structure

1. Na^+ & Cl^- ions (oppositely charged) attract each other.
2. Na^+ & Cl^- are held together by strong Electrostatic Forces of attraction.
3. Sodium chloride (NaCl) does not exist as a molecule but as a combination of oppositely charged ions → Na^+ and Cl^-
4. **The compounds formed in this manner by the transfer of electrons from a metal to a non-metal are known as Ionic Compound or Electrovalent Compound**

Formation of Magnesium Oxide (MgO)

$Mg\ (12) \longrightarrow 2, 8, 2$

$Mg \longrightarrow Mg^{2+} + 2e^-$

(Magnesium cation)

$O\ (8) \longrightarrow 2, 6$

$O + 2e^- \longrightarrow O^{2-}$

(Oxide anion)

(CBSE 2020)

Formation of Magnesium chloride ($MgCl_2$)

$Mg\ (12) \longrightarrow 2, 8, 2$

$Mg \longrightarrow Mg^{2+} + 2e^-$

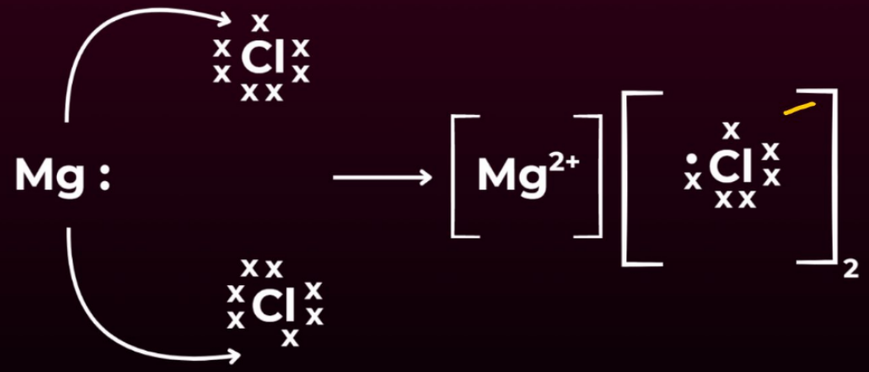
(Magnesium cation)

$Cl\ (17) \longrightarrow 2, 8, 7$

$Cl + e^- \longrightarrow Cl^-$

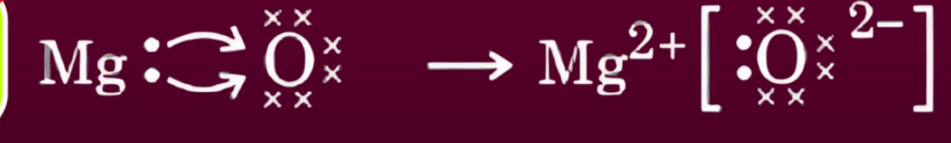
(Chloride anion)

(CBSE 2020)



Q15. The formation of magnesium oxide is correctly shown in option:

CBSE 2025, 2020,2015

A 

B 

C 

D 

Q16. Select ionic compounds from the following:

(a) CCl_4
(b) KCl
(c) HCl
(d) NaCl

CBSE 2025, 2020,2016

A (b) and (c)

B (c) and (d)

C (a) and (c)

D (b) and (d)

Q17. The atomic number of an element is 20. Write its electronic configuration. State whether this element is a metal or a non-metal. What is its valency? Write the name and formula of the compound which this element forms with chlorine.

(CBSE 2021, 2019)

Ca (20) → 2, 8, 8, (2) → Lose

1/2/3 → Metal

Ca^{2+} valency

$Ca^{2+} \times Cl^{-}$

$CaCl_2$

Ionic / Electrovalent Compounds Properties

1. Hard, solid compounds because of strong force of attraction between +ve and –ve ions. Brittle in nature, Breaks into pieces if pressure is applied

2. Have High Melting & Boiling points because large amount of energy is required to break strong inter-ionic attraction.

(CBSE 2023)

3. Generally soluble in water but insoluble in solvents like kerosene, petrol, alcohol etc.

4. In Solid State do not conduct electricity as ions cannot move because of strong electrostatic forces of attraction. (CBSE 2023)

In Molten State, Heat Energy weakens the strong electrostatic forces of attraction and ions can move freely, hence in molten state, it conducts electricity.

In aqueous solution, conducts electricity as solution of ionic compound in water contains ions. Ions move to opposite electrodes. (Water weakens the strong electrostatic forces of attraction between ions).

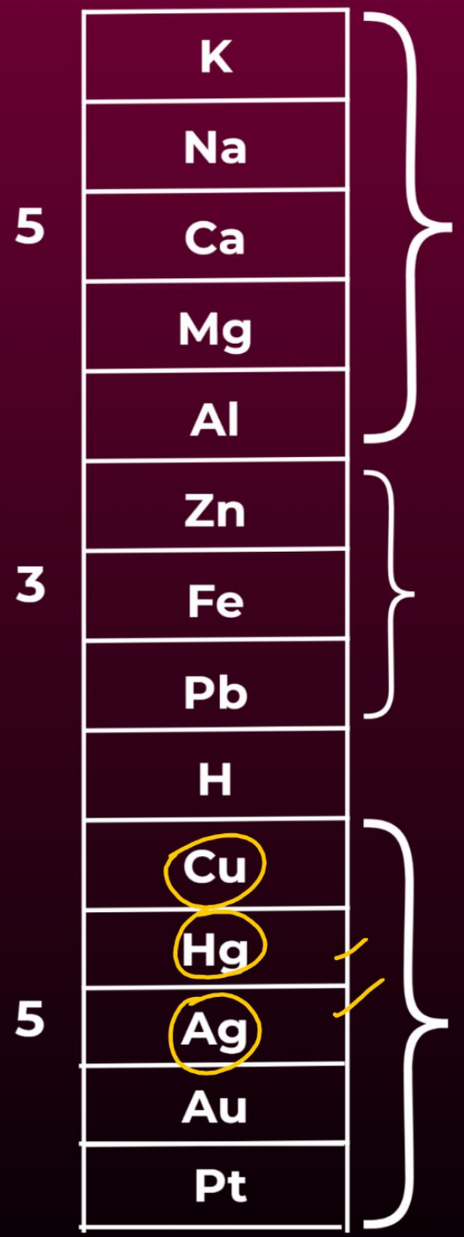
Extraction of Metals

1. **Minerals →** Elements or Compounds which occur Naturally in Earth's crust.

2. **Ores →** Those minerals which contain a very high % of a particular metal & metal can be profitably extracted from it, are called ores.

3 . **Gangue →** Impurities like soil, sand, etc present in metal Ore.

4. **Enrichment Of Ore / Concentration Of Ore →** The process of removing unwanted gangue, from an ore to increase the concentration of the metal



5 3 5

Top in Activity Series

very reactive, so never found in free state as free metal.

C O S

Middle in Activity Series

moderately reactive. Found in Earth's crust in form of Oxides, sulphides & Carbonates

Low in Activity Series

Least reactive, hence found in free state as free metals

Note: Copper, Silver, Mercury are found in free state as well as in combined state as oxides & sulphides.

(CBSE 2024)

The ores of many metals are oxides. This is because oxygen is a very reactive element and is very abundant on the earth.

(CBSE 2023)

Extracting Metals - Middle of Activity Series

ZnS $ZnCO_3 \rightarrow ZnO$

K
Na
Ca
Mg
Al
Zn
Fe
Pb
H
Cu
Hg
Ag
Au
Pt

COS S

1. Present as COS - Carbonates ,Oxides or Sulphides in nature.
2. Sulphides/Carbonates converted to oxide, as it's easy to extract metal from oxide.

- Roasting: Heating sulphide ores strongly in presence of excess air.

$$2ZnS + 3O_2 \xrightarrow{\text{Heat}} 2ZnO + 2SO_2$$

- Calcination: Heating carbonate ores strongly in limited air.

$$ZnCO_3 \xrightarrow{\text{Heat}} ZnO + CO_2$$

- Now, metal oxide is reduced (removal of oxygen) with help of Reducing Agent Carbon. (Coke) → Most common Method

$$ZnO + C \longrightarrow Zn + CO$$

Q19. Assertion (A) : The extraction of metals from their sulphide ores cannot take place without roasting of the ore.
Reason (R) : Roasting converts sulphide ores directly into metals.

(CBSE 2024)

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) is the not the correct explanation of (A)

C. (A) is true, but (R) is false

D. (A) is false, but (R) is true

Q20. Differentiate between roasting and calcination giving chemical equation for each.

(CBSE 2023)

Roasting

Heating sulphide ores strongly in presence of excess air.

$$2ZnS + 3O_2 \xrightarrow{\text{Heat}} 2ZnO + 2SO_2$$

Calcination

Heating carbonate ores strongly in limited air.

$$ZnCO_3 \xrightarrow{\text{Heat}} ZnO + CO_2$$

Extracting Metals Low in Activity Series

K
Na
Ca
Mg
Al
Zn
Fe
Pb
H
Cu
Hg
Ag
Au
Pt

- Their sulphides ore converted to oxides by heating in excess of air - Roasting
- Their oxides on heating converts to metal , without any Reducing Agent

Cinnabar (HgS) - Mercuric (II)Sulphide

$$2HgS + 3O_2 \xrightarrow{\text{Heat}} 2HgO + 2SO_2$$

$$2HgO \xrightarrow{\text{Heat}} 2Hg + O_2$$

$HgS + O_2 \rightarrow$
$Hg \xleftarrow{\Delta} HgO$

Cu_2S

$$2Cu_2S + 3O_2 \xrightarrow{\text{Heat}} 2Cu_2O + 2SO_2$$

$$2Cu_2O + Cu_2S \xrightarrow{\text{Heat}} 6Cu + SO_2$$

Q21. Name the ore of mercury and state the form in which it is found in nature. Write the chemical equations along with the condition required for the reactions involved in the extraction of mercury from its ore.

(CBSE 2024)

$$Cu_2S + O_2 \xrightarrow[\text{Roasting}]{\text{Heat}} SO_2\uparrow + \underline{Cu_2O}$$

R.M. $Cu_2O + Cu_2S$

$$Cu_2O + Cu_2S \xrightarrow{\text{Heat}} SO_2 + Cu$$

Extracting Metals - Top of Activity Series

Na_2O CaO MgO $+C \longrightarrow$

K
Na
Ca
Mg
Al

Zn
Fe
Pb
H
Cu
Hg
Ag
Au
Pt

1. Carbon cannot reduce their oxides, these metals are very reactive & have More affinity (likeness) for oxygen than carbon.

$Na_2O + C \longrightarrow CO_2 \times$

imp

2. Such Metals are obtained by Electrolytic Reduction (Reduction with help of electric current)

Na, Ca, Mg ⟶ Electrolysis of Molten chlorides ; Al from Oxide

$$\underset{\text{(Molten)}}{Na^+Cl^-} \xrightarrow[\text{current}]{\text{electric}} \underset{\text{(Cation)}}{Na^+} + \underset{\text{(Anion)}}{Cl^-}$$

At Cathode : $2Na^+ + 2e^- \longrightarrow 2Na$

At Anode : $2Cl^- \rightarrow 2e^- + Cl_2$

Q22. The most common method of extraction of metals from their oxide ores is:

(CBSE 2025,2023, 2016, 2018)

A Reduction with carbon

B Reduction with hydrogen

C Reduction with aluminium

D Electrolytic reduction

MO

$ZnO + C \rightarrow CO + Zn$

Q23. Why can metals high up in the reactivity series not be obtained by reduction of their oxides by carbon?

CBSE 2025, 2018,2016

Ans- Metals high in the reactivity series cannot be extracted by Carbon Reduction because they have a much Stronger Affinity for oxygen than carbon . Carbon is not a strong enough reducing agent to remove oxygen from these stable, highly reactive metal oxides. Therefore, a more powerful process like electrolytic reduction is required .

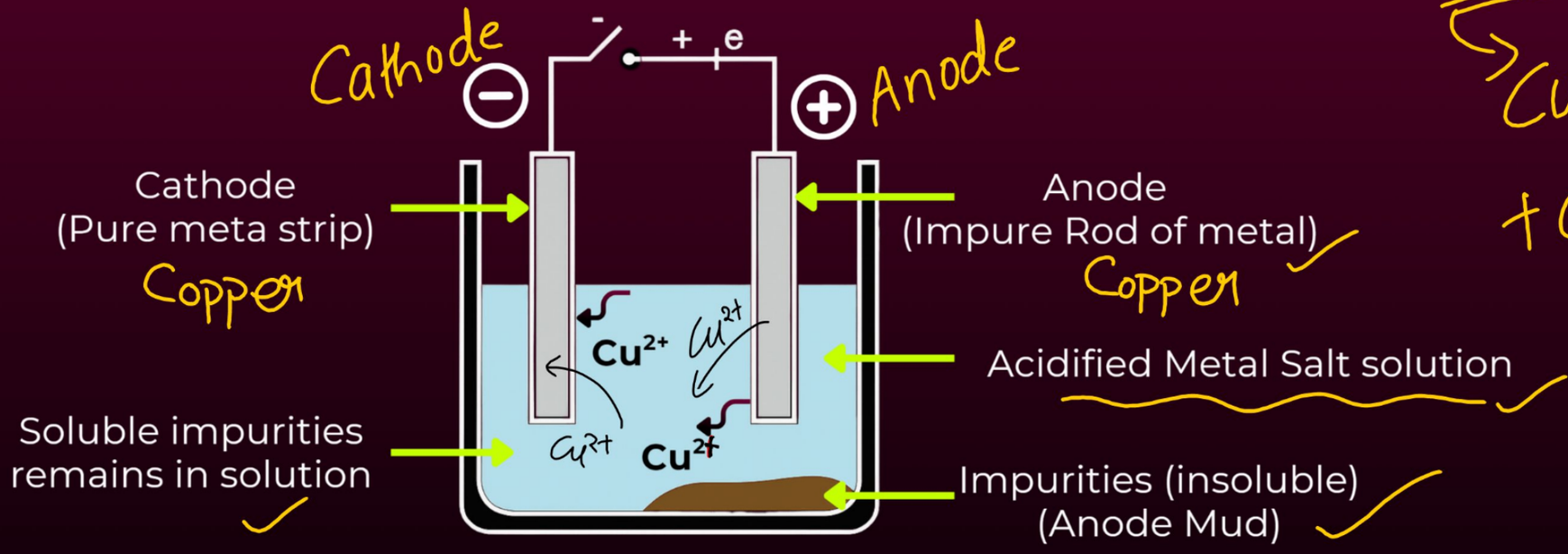
Refining of Metals

Top Middle Bottom

1. Metal obtained after Carbon Reduction or Electrolytic Reduction is not very pure.
2. The most common method for refining metal is Electrolytic Refining.

Example : Electrolytic Refining of Copper using $CuSO_4$ Solution

Copper → $CuSO_4(aq)$ + acid



At Anode : Pure copper enters solution

At Cathode : Equivalent amount of Pure Copper from solution deposits at Cathode.

Q24. The metals produced by various reduction processes are not very pure. They contain impurities which must be removed to obtain pure metals. The most widely used process for refining impure metals is electrolytic refining. In this process, the chemical effect of electric current is used.

(a) Name the materials used to make anode and cathode in the refining of copper by this process.
(b) Name the salt of copper used as an electrolyte in this process and write its molecular formula.
(c) What happens when a steady current is passed through the electrolyte? Name the part of the electrolytic cell where (1) pure copper is obtained and (2) impurities settle.

(CBSE 2025,2021,2018)

ANS-

a) Anode - Impure Rod of Copper Cathode - Thin Sheet Of Pure Copper

b) Aqueous Copper Sulphate -

c) When Steady current is passed , Electrolysis occurs and Pure copper Metal Ions from Anode Rod enters solution and an Equivalent amount of Pure Copper from solution deposits at Cathode.
Pure copper is obtained at Cathode . Impurities settle below anode as Anode Mud

Displacement Reactions in Extraction Of Metals

COS

1) $Fe_2O_3 + 2Al(s) \rightarrow Al_2O_3 + 2Fe(l) + Heat$

Learn

Thermit Reaction

2) $3MnO_2(s) + 4Al(s) \rightarrow 3Mn(l) + 2Al_2O_3(s) + Heat$

Q25. Displacement reactions also play a key role in extracting metals in the middle of the reactivity series." Justify this statement with two examples.

CBSE 2025, 2018,2016

Corrosion

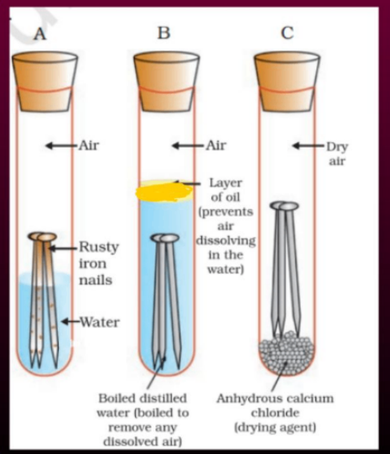
When a metal is attacked by substances around it such as moisture (water vapour + oxygen), acid etc., it is said to corrode and this process is called corrosion.

Example -

1) Rusting of Iron

Iron oxygen Water

Hydrated ron oxide
(RUST -Reddish Brown)
Brown - Flaky



Conditions Necessary For Rusting -

1. Water 2. Oxygen ----> MOIST AIR

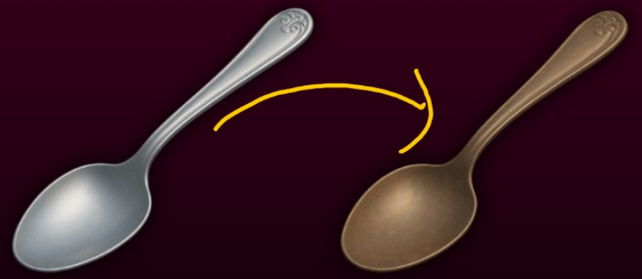
Which Tube will show Rusting Of Iron? A

2) Tarnishing of copper

Copper (Red) $\xrightarrow[H_2O + CO_2]{\text{Moist Carbon Dioxide}}$ Basic Copper carbonate (green)

3) Tarnishing of silver

Silver $\xrightarrow{\text{Sulphur in Air}}$ Silver sulphide (Black)



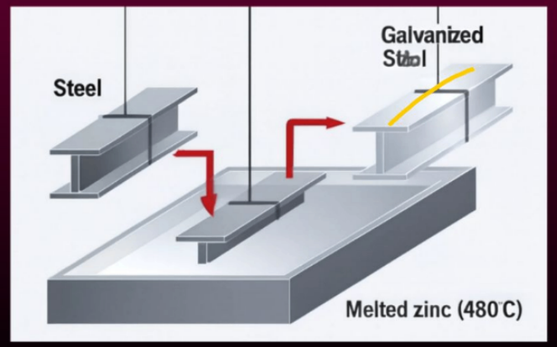
Note : Corrosion is an example of Oxidation

Prevention of Corrosion

Painting , Oiling , Greasing, Anodising, Galvanising

Galvanisation

Steel & Iron are coated with thin layer of Zinc to protect from Rusting. Even when the zinc coating is broken, Zinc corrodes first because zinc is more reactive than iron, thus preventing iron.



Ca
Mg
Al
Zn
Fe
Pb

Anodising

Process of forming a thick oxide layer of Aluminium. This layer prevents corrosion of metal. The oxide layer also give articles attractive finish.

Q26. (a) Define corrosion.
(b) What is corrosion of iron called?
(c) How will you recognise the corrosion of silver?
(d) Why corrosion of iron is a serious problem?
(e) How can we prevent corrosion of iron?

(CBSE 2023 2019, 2017,2016)

a) When a metal is attacked by substances around it such as moisture (water vapour + oxygen), acid etc., it is said to corrode and this process is called corrosion.

b) Rusting

c) It will turn black from silver colour

d) corrosion of iron is a serious problem as it -
i) **Weakens the metal** -Rust eats the iron and makes it weak and breakable. Bridges, buildings, and vehicles can get damaged.
ii)**Economic loss** -Repairing or replacing rusted iron needs a lot of money.

e) By Painting , Oiling , Greasing, Anodising, Galvanising

Alloy

A homogeneous mixture of two or more metals, or a metal & non metal.

1. Steel - Pure Iron + Carbon (0.05%) → Hard & Strong Iron Carbon Alloy
2. Stainless steel → Iron + Nickel + Chromium - Hard & do not rust
3. Amalgam → Alloy in which one metal is mercury
4. Brass (BCoZ) → Alloy of Zn + Cu
5. Bronze (CoaT) → Alloy of Copper & Tin (Cu + Sn)

Poor conductor of Electricity

6. Solder (SoTeLa) → Alloy of Lead & Tin (Pb + Sn)

Melts very easily - Low Melting Point

The properties of an alloy is different from the metals from which it is obtained.

@divyasharma123a 3 days ago
22:02 option (D)

@numankhan8061 2 weeks ago
22:00 (D) retina.

@NaitikSharma-gs5re 1 day ago
22:00 ,D)Retina

@Naman-he7xp 9 days ago
22:00 option d) retina

@priyvrattripathi351 • 4 days ago
22:40 D option hai sir

@sadiq_md 10 days ago
22:00 Option (D) Retina

@Aryanartist489 2 days ago
22:00 Retina

@PratapSinghar-h7f 1 day ago
22:00 option d = RETINA

@rajshreechaudhary6155 1 day ago
22:00 .
d) retina.

@AdityaStudySpace 1 day ago
sir option D.retina

@pranjal3061 4 days ago
22:01 retina

@pranagashe6833 14 hours ago
22:06 Ans is option (D) Retina

@AyushDeshmukh-sl8xb 11 hours ago
Option [D] Retina