

Metals & Non-Metals

Quick Study Guide

HOW TO USE THIS GUIDE

HIGHLIGHTED TEXT SHOWS IMPORTANT POINTS

★ MARKS HIGH-FOCUS TOPICS

📝 INDICATES EXAM TIPS

⚠️ SHOWS COMMON ERRORS

💡 GIVES QUICK TIPS

PHYSICAL PROPERTIES

Mnemonic: "MEDAL WINNER"

M Malleable (metal ko peeto)
E Electrical conductivity
D Ductile (wire banao)
A Appearance shiny
L Lustrous surface

Daily Examples:

- Metals: Copper wire, aluminum foil
- Non-metals: Coal, Sulphur
- Exceptions: Mercury (liquid metal)

Common Errors:

- Forgetting exceptions
- Missing comparisons
- Incomplete properties

W Wire and sheets
I Impact resistant
N Non-metals opposite
N No malleability
E Easy to break
R Remember exceptions

CHEMICAL EQUATIONS & BALANCING

Mnemonic: "PAPA KA MOBILE"

P Potassium (sabse reactive)
A Aluminum (middle mai)
P Proper order
A Activity series

M Magnesium
O Order important
B Before iron
I Iron ka place
L Less reactive copper
E End at gold

K Kalciun (Calcium)
A After sodium

Must Remember:

- K > Na > Ca > Mg > Al > Zn > Fe > Cu > Ag > Au
- Top = Most reactive
- Bottom = Least reactive
- H = Middle (reference point)

REACTION WITH OXYGEN

Mnemonic: "OXYGEN DOST"

O Oxide formation
X Xylem like spread
Y Yellow flame sometimes
G Garam karke dekho
E Electrons transfer
N Note color change

D Different colors
O Oxide types
S Surface changes
T Temperature effect

Key Reactions:

- $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$ (white)
- $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$
- $2\text{Cu} + \text{O}_2 \rightarrow 2\text{CuO}$ (black)
- $4\text{P} + 5\text{O}_2 \rightarrow 2\text{P}_2\text{O}_5$

METAL REACTIONS

Mnemonic: "REACTION KING"

R Rust formation
E Electron loss
A Action with water
C Combination reactions
T Temperature rise
I Ion formation
O Ion formation
N Ion formation

K Keep reactivity in mind
I Important products
N Note conditions
G Gas evolution

Important Reactions

Metal + Water:

- $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2$ (fizz!)
- $\text{Ca} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{H}_2$
- $\text{Fe} + \text{Steam} \rightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$

Metal + Acid:

- $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$
- $\text{Mg} + \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$

PRACTICAL ACTIVITIES

Mnemonic: "TEST MASTER"

T Test with flame
E Effect of heat
S Surface study
T Temperature change

M Metal testing
A Action observation
S Sound check
T Time noting
E Evidence collection
R Record changes

Lab Activities:

- Burning Mg ribbon
- Iron nail in CuSO_4
- Cu wire heating
- Na reaction with water

EXTRACTION OF METALS

Mnemonic: "DHATU NIKALO"

D Dig from earth
H Heat the ore
A Add reducing agent
T Temperature control
U Use carbon/heat

N Note the steps
I Important ores
K Keep pure metal
A Away from air
L Less reactive = easy
O Oxide reduction

Remember Steps:

- Concentration of ore
- Conversion to oxide
- Reduction to metal
- Purification



CORROSION & PREVENTION

Mnemonic: "ROKO TOKO"

- R Rust ko roko
- O Oxygen se bachao
- K Keep metal safe
- O Oil coating

- T Treatment needed
- O Observe surface
- K Keep painting
- O Oiling regular

Prevention Methods:

1. Painting
2. Oiling/Greasing
3. Galvanization
4. Alloying
5. Anodization

QUICK REVISION CHECKLIST

Before Exam:

- ✓ Physical properties comparison
- ✓ Reactivity series
- ✓ Important reactions
- ✓ Extraction methods
- ✓ Prevention of corrosion
- ✓ Practical observations

Scoring Tips:

1. Draw neat diagrams
2. Write balanced equations
3. Show color changes
4. Include observations
5. Compare properties in table

HIGH FOCUS AREAS

1. Chemical reactivity (5 marks)
2. Physical properties (4 marks)
3. Metal extraction (4 marks)
4. Practical based (4 marks)
5. Corrosion (3 marks)

