

⇒ Atom & ions



SAFALTA CLASS<sup>TM</sup>

An Initiative by **अमरउजाला**

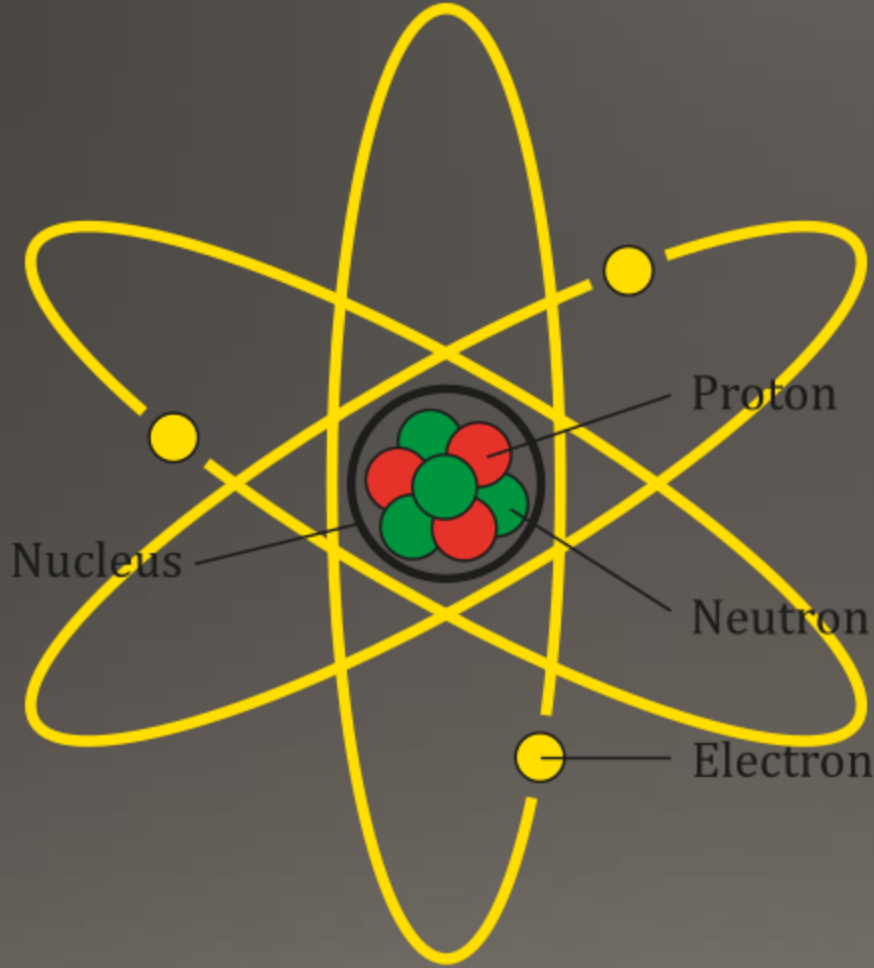
# ATOM

$$p^+ = e^-$$

$$\begin{matrix} \text{(+ve)} & \text{(-ve)} \\ \hline \end{matrix}$$

$$= 1.6 \times 10^{-19} \text{ C}$$

~~4.2 x 10<sup>-18</sup> J~~ ⇒ No charge



1-30

At. NO. =

At. Wt. =

**Table 4.1: Composition of Atoms of the First Eighteen Elements with Electron Distribution in Various Shells**

Name of Element	Symbol	Atomic Number	Number of Protons	Number of Neutrons	Number of Electrons	Distribution of Electrons				Valency
						K	L	M	N	
Hydrogen	H	1	1	-	1	-	-	-	1	
Helium	He	2	2	2	2	-	-	-	0	
Lithium	Li	3	3	4	3	2	1	-	1	
Beryllium	Be	4	4	5	4	2	2	-	2	
Boron	B	5	5	6	5	2	3	-	3	
Carbon	C	6	6	6	6	2	4	-	4	
Nitrogen	N	7	7	7	7	2	5	-	3	
Oxygen	O	8	8	8	8	2	6	-	2	
Fluorine	F	9	9	10	9	2	7	-	1	
Neon	Ne	10	10	10	10	2	8	-	0	
Sodium	Na	11	11	12	11	2	8	1	1	
Magnesium	Mg	12	12	12	12	2	8	2	2	
Aluminium	Al	13	13	14	13	2	8	3	3	
Silicon	Si	14	14	14	14	2	8	4	4	
Phosphorus	P	15	15	16	15	2	8	5	3.5	
Sulphur	S	16	16	16	16	2	8	6	2	
Chlorine	Cl	17	17	18	17	2	8	7	1	
Argon	Ar	18	18	22	18	2	8	8	0	

## Atomic Mass and Valency of First 30 Elements



ELEMENT	ATOMIC NUMBER	ATOMIC MASS	VALENCY
Hydrogen	1	1.0079	(-1), +1
Helium	2	4.0026	0
Lithium	3	6.941	+1
Beryllium	4	9.0122	+2
Boron	5	10.811	-3, +3
Carbon	6	12.0107	(+2), +4
Nitrogen	7	14.0067	-3, -2, -1, (+1), +2, +3, +4, +5
Oxygen	8	15.9994	-2
Fluorine	9	18.9984	-1, (+1)
Neon	10	20.1797	0
Sodium	11	22.9897	+1
Magnesium	12	24.305	+2
Aluminum	13	26.9815	+3
Silicon	14	28.0855	-4, (+2), +4
Phosphorus	15	30.9738	-3, +1, +3, +5
Sulfur	16	32.065	-2, +2, +4, +6
Chlorine	17	35.453	-1, +1, (+2), +3, (+4), +5, +7
Argon	18	39.948	0
Potassium	19	39.0983	+1
Calcium	20	40.078	+2
Scandium	21	44.9559	+3
Titanium	22	47.867	+2, +3, +4
Vanadium	23	50.9415	+2, +3, +4, +5
Chromium	24	51.9961	+2, +3, +6
Manganese	25	54.938	+2, (+3), +4, (+6), +7
Iron	26	55.845	+2, +3, (+4), (+6)
Nickel	27	58.6934	+2, +3, (+4)
Cobalt	28	58.9332	(+1), +2, (+3), (+4)
Copper	29	63.546	+1, +2, (+3)
Zinc	30	65.39	+2

# CHARGED PARTICLES

आवेशित कण  $\Rightarrow$  ions (आयन)

Na  $\rightarrow$  Atom

Na<sup>+</sup>  $\rightarrow$  ion

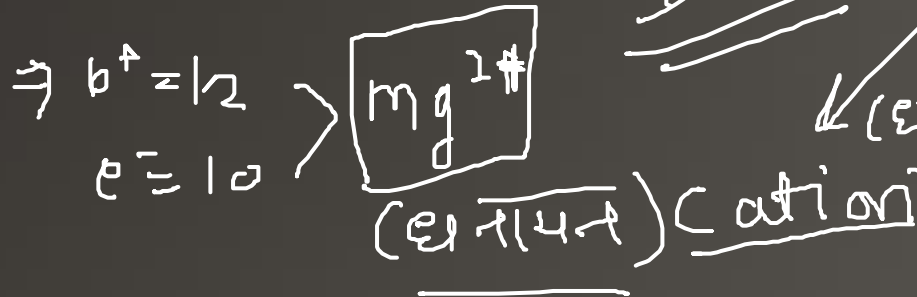
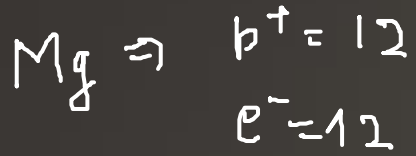
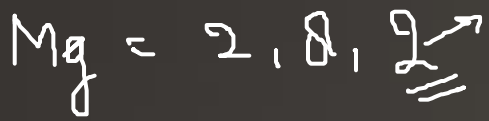
$\Rightarrow$  ionic compound: - Metal + Non-metal

आयनिक यौगिक

धातु + अधातु

e.g. - NaCl  $\Rightarrow$

Na + Cl



ions (आयन)

दाता  $< 4e^-$

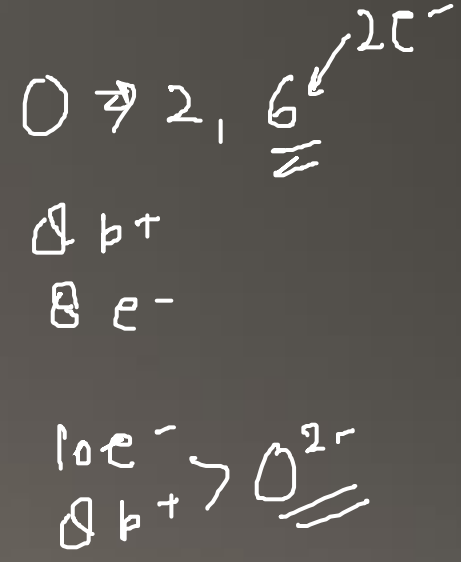
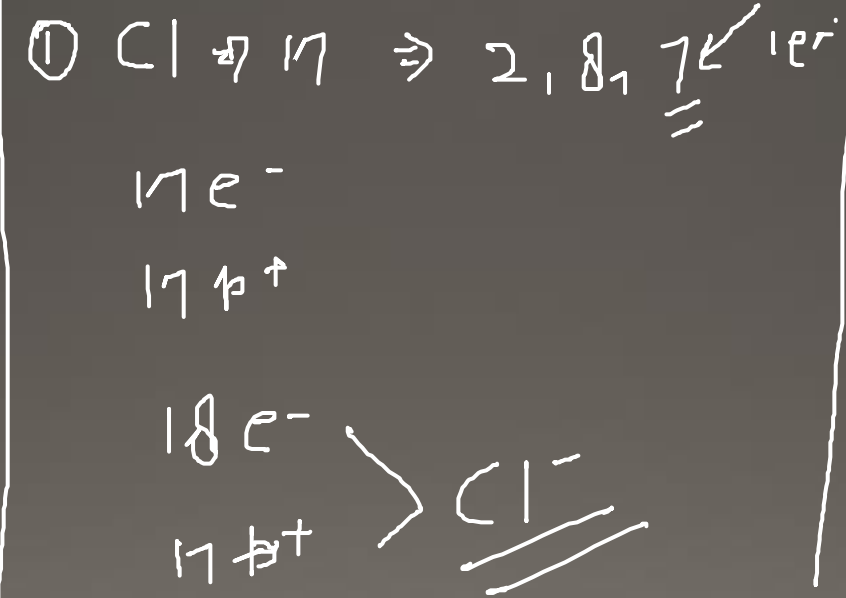
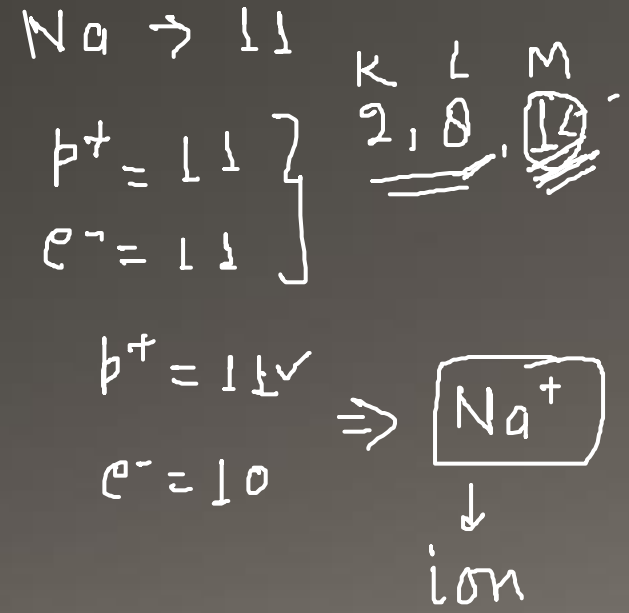
$4e^- <$  ग्राहक

(Donor)  
(दाता)

(ग्राहक) Acceptor

Anion (ग्राहक)

e.g:  
 $8e^-$   
valance electrons



Al  $\rightarrow$  13

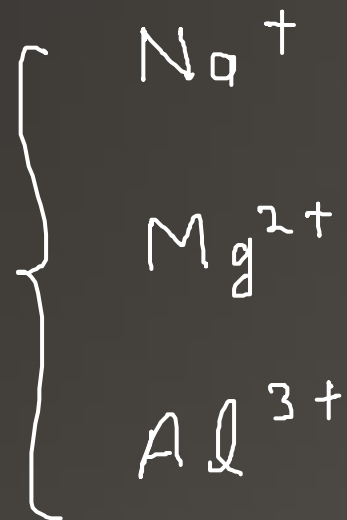
Al<sup>3+</sup>

N  $\rightarrow$  7

N<sup>-3</sup>



## Cation (एनायन)



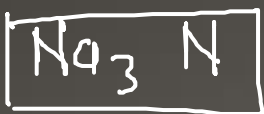
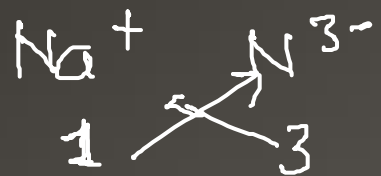
Sodium oxide



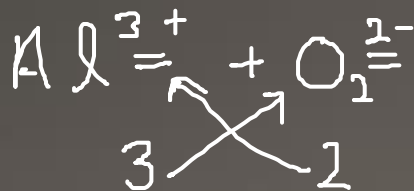
NaCl Sodium chloride

## Anion (ऋणायन)

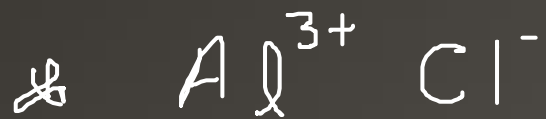
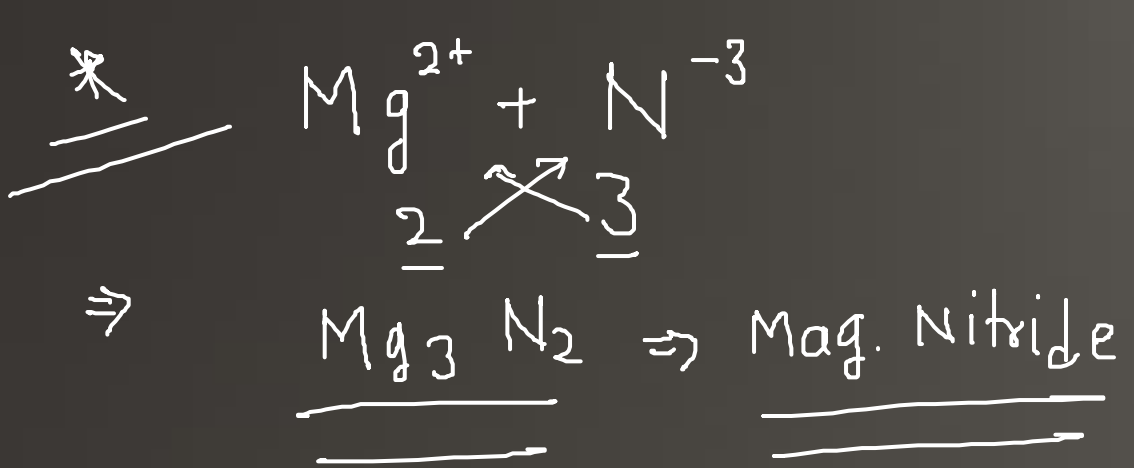
Cl



Sodium Nitride



Aluminum oxide



Aluminum chloride

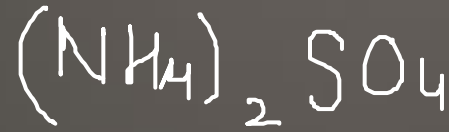
Single element

# Poly atomic Ions

( बहुपरमाण्वीय आयन )

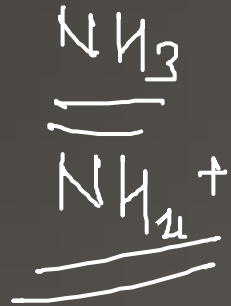
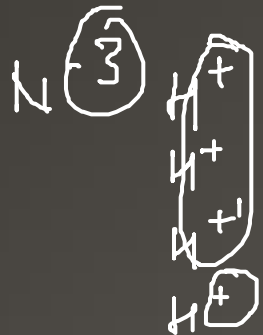


\* Ammonium ⇒



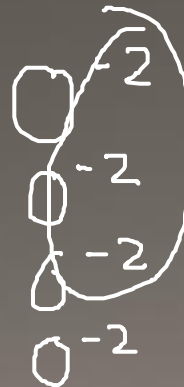
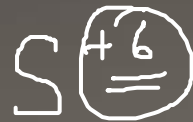
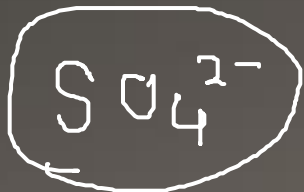
⇓

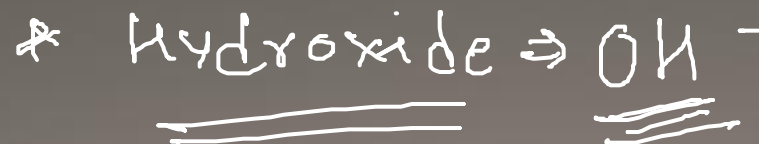
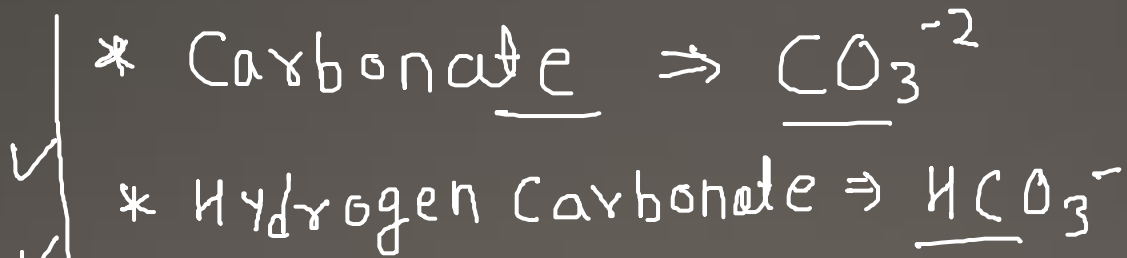
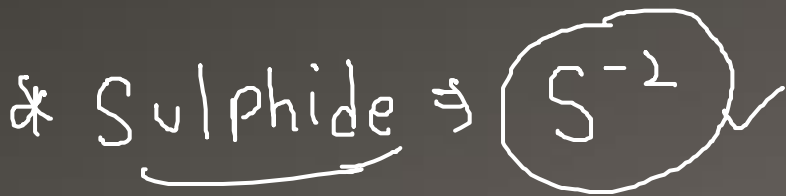
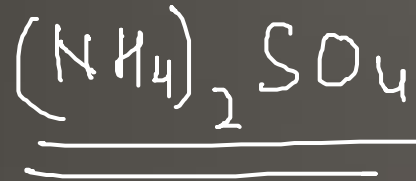
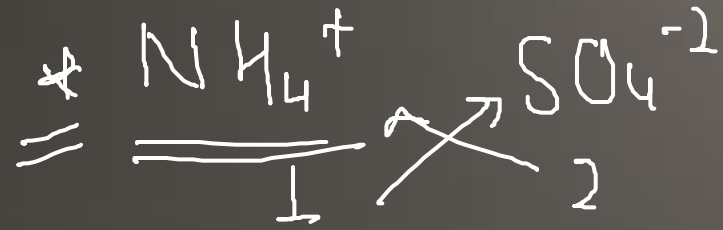
Ammonium sulphate



\*

Sulphate ⇒





\*  $Fe(II)$   $Fe(III)$

$\Rightarrow Fe^{2+} \rightarrow Iron(II)$

$Fe^{3+} \Rightarrow Iron(III)$

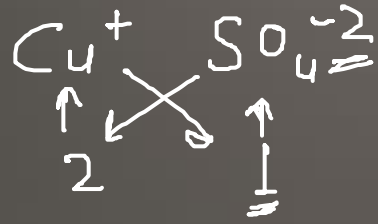
$\Rightarrow Cu^+ \Rightarrow Copper(I)$

$Cu^{++} \Rightarrow Copper(II)$

$\Rightarrow Copper(II) Sulphate \Rightarrow Cu^{2+} SO_4^{-2}$

(Blue Vitriol)  $\Rightarrow CuSO_4 \Rightarrow$  (आला सोडा)  
 $Cupric Sulphate$

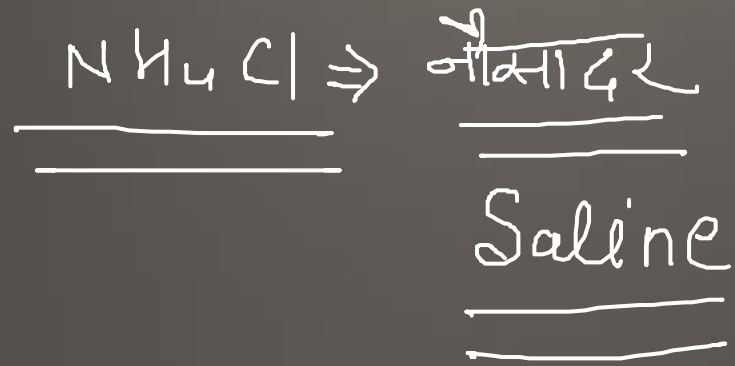
Copper(I) Sulphate



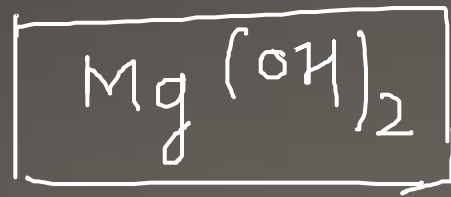
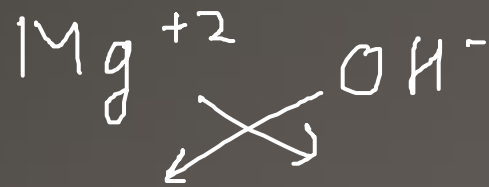
$Cu_2SO_4 \Rightarrow Cuprous$

$\Rightarrow Sulphate$

\* Ammonium Chloride: -  $\text{NH}_4^+$   $\text{Cl}^-$



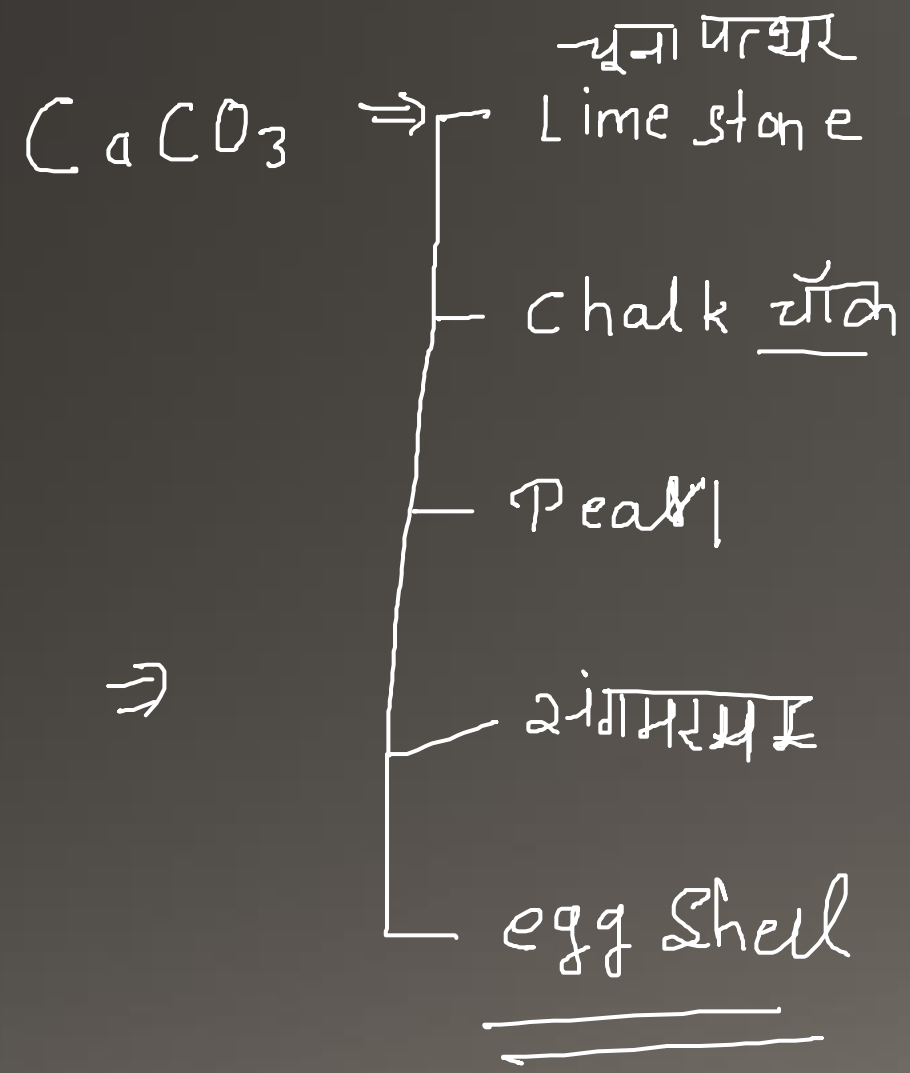
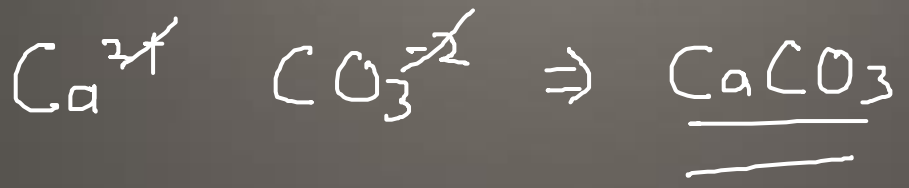
\* mag. Hydroxide: -

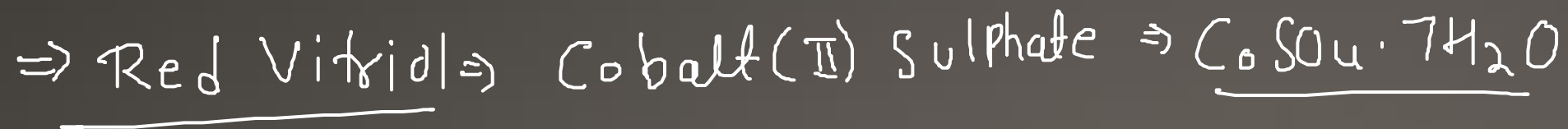
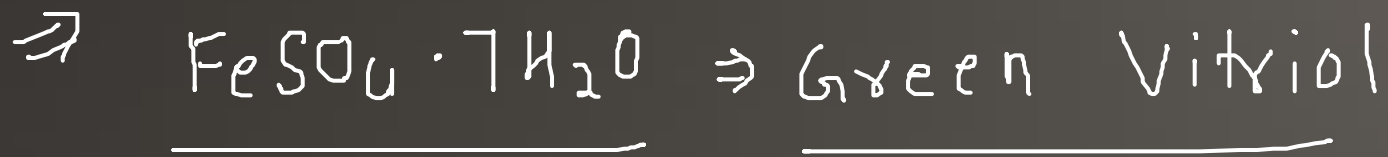
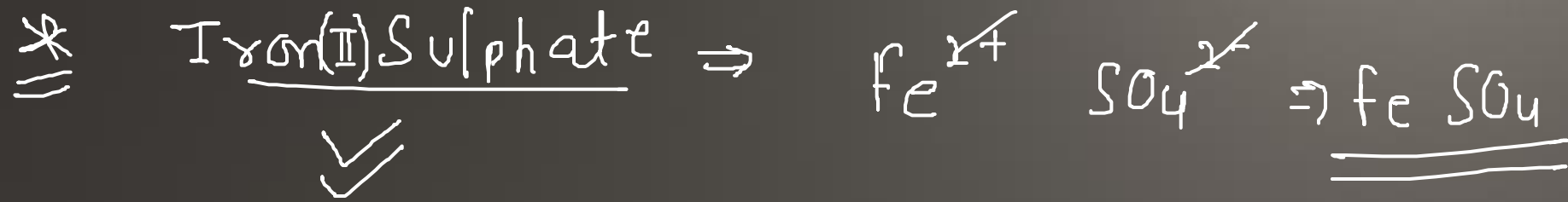


$\Rightarrow$  Milk of magnesia  
 $\Downarrow$   
Base

used as Antacid

\* Calcium Carbonate:-







\* Atomic mass

परमाणु भार / द्रव्यमान

molecular mass

अणु का द्रव्यमान

molar mass

मोल द्रव्यमान



O → आक्सीजन का परमाणु

O<sub>2</sub> → अणु

O का परमाणु = 8 <sup>016</sup> ⇒ 16 unit → Atomic mass

O<sub>2</sub> का अणु = 32 unit ⇒ molecular mass

O → 16 gm

O<sub>2</sub> → 32 gm } molar mass

$N \rightarrow \underline{14 \text{ unit}} \rightarrow \text{Atom}$

$N_2 \rightarrow \underline{28 \text{ unit}} \rightarrow \text{molecule}$

$(14 \text{ \& } 28) \text{ gm} \rightarrow$

$\Rightarrow$

**Don't Forget to Like /  
Comment & Share this  
video**



[www.Youtube.com/safaltaclass](http://www.Youtube.com/safaltaclass)



[www.Facebook.com/safaltaclass](http://www.Facebook.com/safaltaclass)



[www.Instagram.com/safaltaclass](http://www.Instagram.com/safaltaclass)



Google Play  
Store



SAFALTA CLASS