



El Prof In Chemistry

1st session

- 1- Difference between matter , atoms , molecules , elements and compounds
- 2- Difference between metal ,non-metal and metalloid
- 3- Write chemical formula for any compound

2nd session

- 1- Type of compounds
- 2- Salts consist of
- 3-Important compounds
- 4- Balanced equation

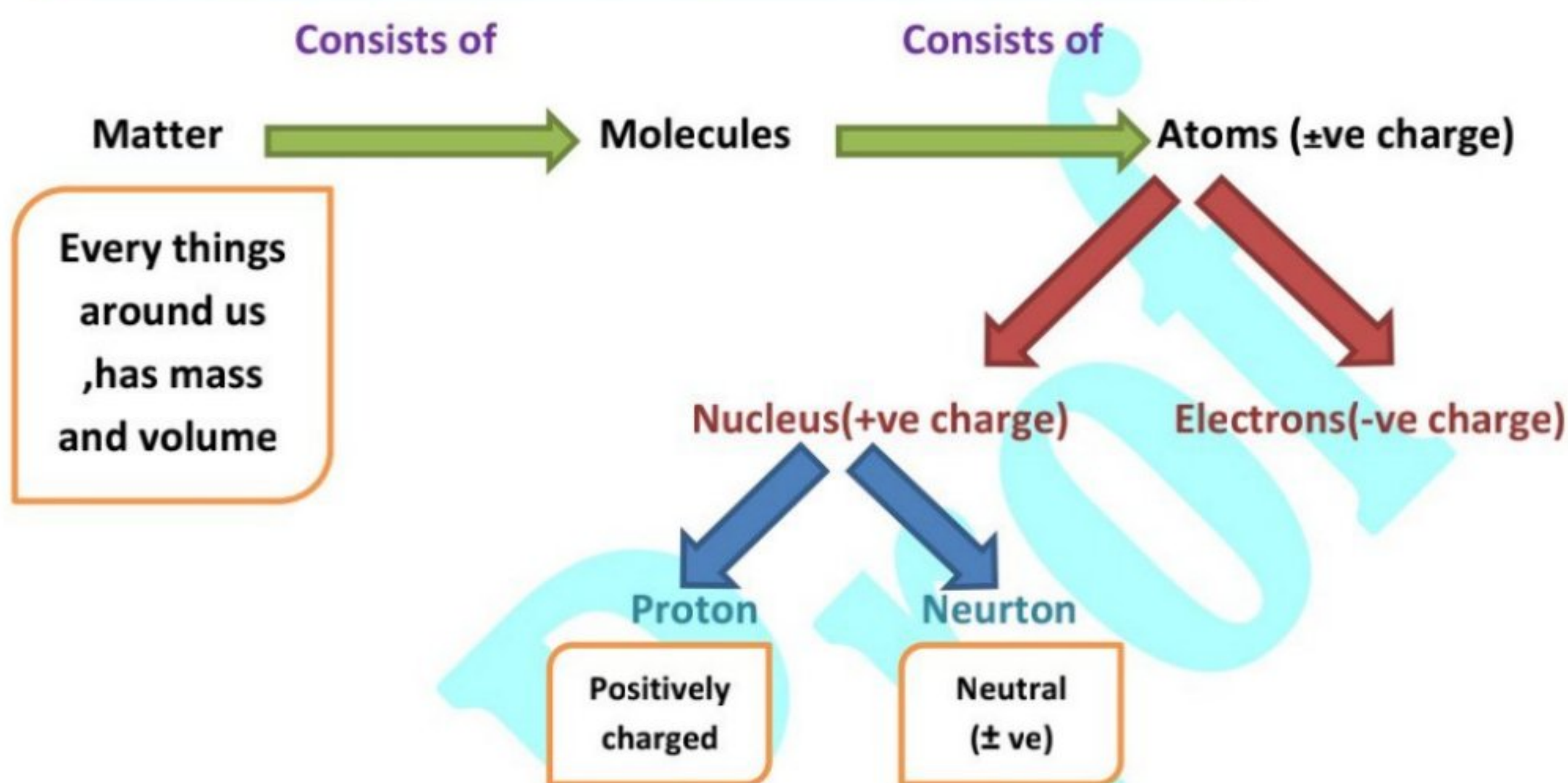
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1ST SESSION



1- Different between Matter , Molecules , Atoms , Elements and Compounds.



♠♣♠ Cars made of iron , so car is **Matter** & iron is **Element**.

♠♣♠ **Compound** is consists of elements.

♠♣♠ Electron rotate around the nucleus in **fixed orbit** .

♠♣♠ Electronic configuration depend on **valence electron** in outer most energy level.

As : Na_{11} : 2 , 8 , 1

Al_{13} : 2 , 8 , 3

So we must know some of element from periodic table at least from **1** to **20**

Element	Electronic configuration	Element	Electronic configuration	Element	Electronic configuration	Element	Electronic configuration
1 H	1	6 C	2,4	11 Na	2,8,1	16 S	2,8,6
2 He	2	7 N	2,5	12 Mg	2,8,2	17 Cl	2,8,7
3 Li	2 , 1	8 O	2,6	13 Al	2,8,3	18 Ar	2,8,8
4 Be	2 , 2	9 F	2,7	14 Si	2,8,4	19 K	2,8,8,1
5 B	2 , 3	10 Ne	2,8	15 P	2,8,5	20 Ca	2,8,8,2

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2- Difference between metal ,non-metal and metalloid

♠Metal

→ element whose outer most energy level 1 or 2 or 3

→ lose 1 , 2 , 3 electron

¹ H	1
² He	2
³ Li	2,1
⁴ Be	2,2
¹² Mg	2,8,2

Li ⁺	Lithium ion
Na ⁺	Sodium ion
K ⁺	Potassium ion
Ag ⁺	Silver ion
Mg ²⁺	Magnesium ion
Ca ²⁺	Calcium ion
Zn ²⁺	Zinc ion
Ba ²⁺	Barium ion
Al ³⁺	Aluminum ion
Fe ²⁺	Iron (II)[ferrous]ion
Fe ³⁺	Iron (III) [ferric] ion
Cu ⁺	Copper (I)[cuprous]ion
Cu ²⁺	Copper (II)[cuproic]ion

♠Non- metal

→ element whose outer most energy level 5 or 6 or 7

→ gain 1 ,2, ,3electron

⁷ N	2,5
⁸ O	2,6
⁹ F	2,7
¹⁵ P	2,8,5
¹⁶ S	2,8,6

F ⁻	Fluoride	O ²⁻	Oxide
Cl ⁻	Chloride	S ²⁻	Sulphide
Br ⁻	Bromide	N ³⁻	Nitride
I ⁻	Iodide	P ³⁻	phosphide

♠Metalloid → elements take some properties from metal ,not from non- metal and vice versa as Si , Ge ,B, As ,Sb ,Te

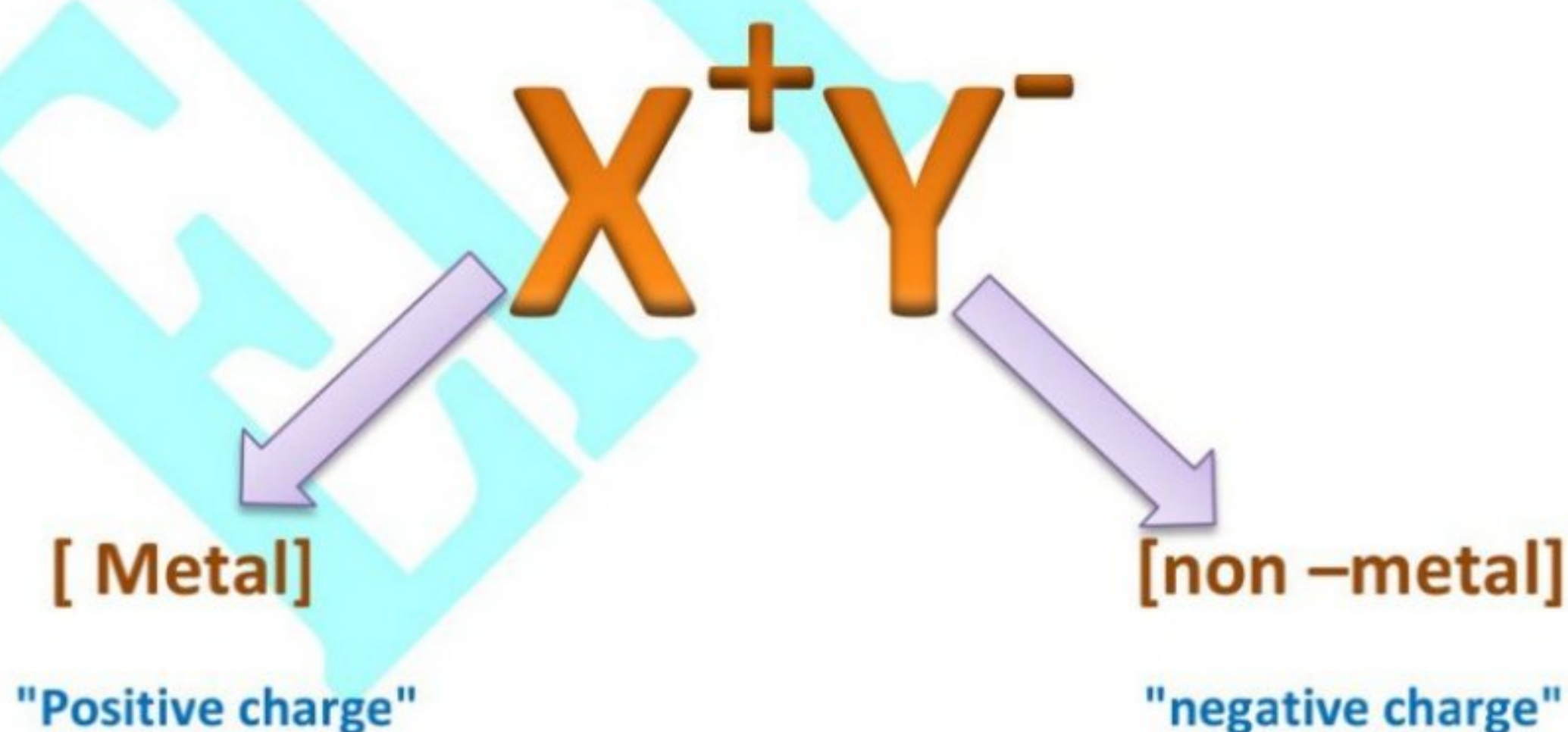
3- Write chemical formula for any compound



♠♣♠ we must know some atomic group to form chemical formula.

OH^-	Hydroxide	ClO_3^-	Chlorate
NO_3^-	Nitrate	SO_4^{2-}	Sulphate
CH_3COO^-	Acetate	CO_3^{2-}	Carbonate
HCO_3^-	Bicarbonate	CrO_4^{2-}	Chromate
HSO_4^-	Bisulphate	$\text{Cr}_2\text{O}_7^{2-}$	Dichromate
NO_2^-	Nitrite	SO_3^{2-}	Sulphite
MnO_4^-	Permanganate	PO_4^{3-}	Phosphate

So chemical reaction consists of



For example :

(1) Na Cl (2) Ca Cl (3) K O (4) Ag Cr_2O_7 (5) Be ClO_3

.....

.....

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(6) $\text{NH}_4 \text{ PO}_4$ (7) Mg PO_4 (8) Na SO_4 (9) Ca NO_3
(10) $\text{NH}_4 \text{ SO}_4$



Write chemical formula for each of the following :

1- sodium aluminate

2- sodium carbonate

3- aluminium sulphate

2- calcium nitrite

5- ferric hydroxide

6- potassium chromate

7- copper sulphate

8- iron (II) bicarbonate

9- carbon dioxide

10- calcium oxide

11- iron (II) hydroxide

12- lead (II) phosphate

13- potassium bicarbonate

14- carbon tetrachloride

15- sulphur dioxide

16- sodium phosphate

17- hydrogen sulphide

18- zinc carbonate

19- ammonium nitrate

20- potassium sulphite

21- manganese dioxide

22- aluminium hydroxide

23- copper (II) chloride

24- carbon tetra fluoride

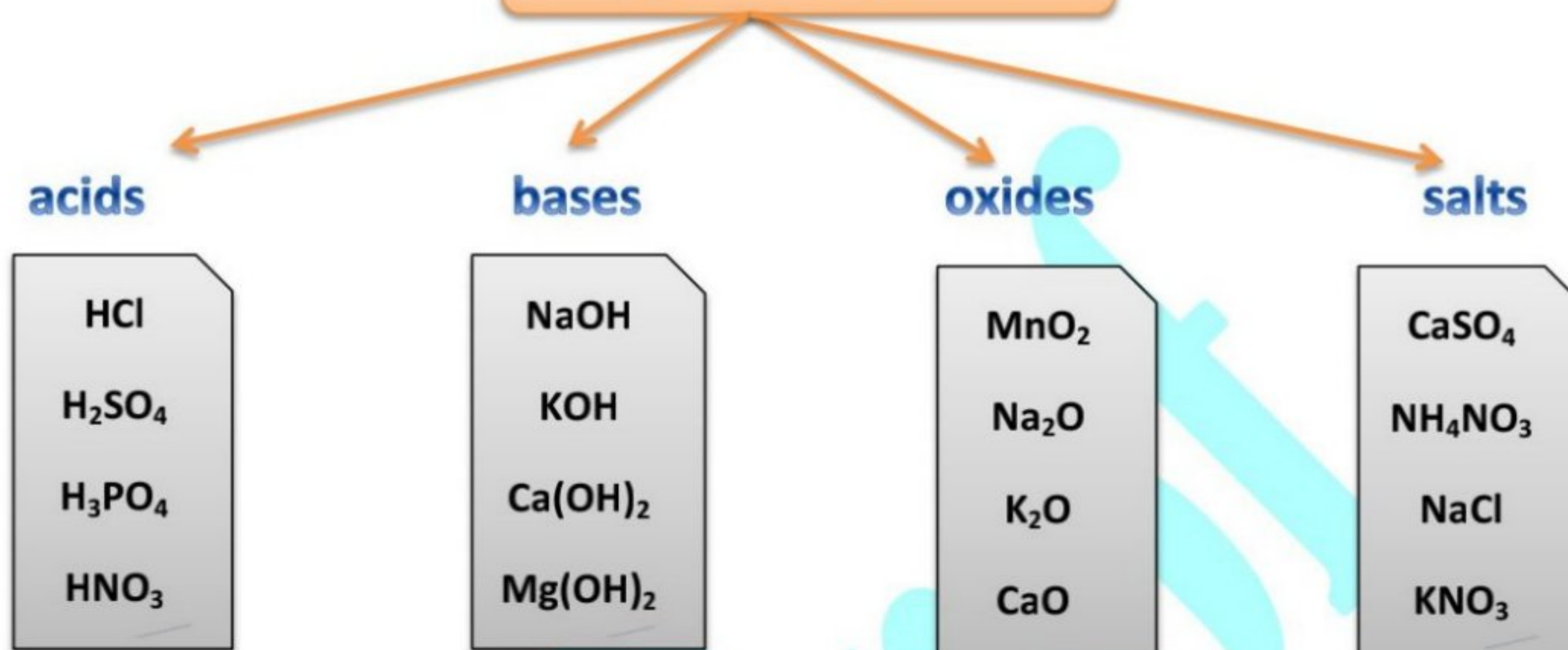
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2ND SESSION



1- Type of compounds



2- Salts consist of

Cation (**positive part**) → Metal → For Example Na⁺, K⁺, NH₄⁺, Al³⁺, Mg²⁺

Anion (**negative part**) → Non-Metal → For Example Cl⁻, O²⁻, N³⁻, OH⁻, SO₄²⁻, PO₄³⁻

3-Important compounds

H₂O → water molecule

PH₃ → phosphine

CH₄ → methane

NH₃ → ammonia gas

NH₄⁺ → ammonium ion

4- Balanced equation

We must know some information before balanced equation

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A- any compound may be ionic or covalent

♠ **Ionic compound.**

► Metal + non-metal

OR

► metal + atomic group

♠ **Covalent compound.**

► non-metal + non-metal

► **By naming covalent compound, We must count number of atoms sharing in forming compound.**

CO → carbon mono oxide

CO₂ → carbon dioxide

PBr₃ → phosphorous tri bromide

CF₄ → carbon tetra fluoride

P₂O₅ → phosphorous penta oxide

SF₆ → sulphur hexa fluoride

B- We must know physical properties of element

Metals → all of them solid except Hg (liquid)

Non-metal → **solid** ► [S, P, C]

liquid ► [Br only]

gas ► [O₂, H₂, Cl₂, F₂, N₂, I₂]

C- by naming acids from its ions

► **ate** convert to **ic**

for example

PO₄³⁻ (phosph**ate**) → H₃PO₄ (phosphor**ic** acid)

CH₃COO⁻ (acet**ate**) → CH₃COOH (acetic acid)

SO₄²⁻ (sulph**ate**) → H₂SO₄ (sulphur**ic** acid)

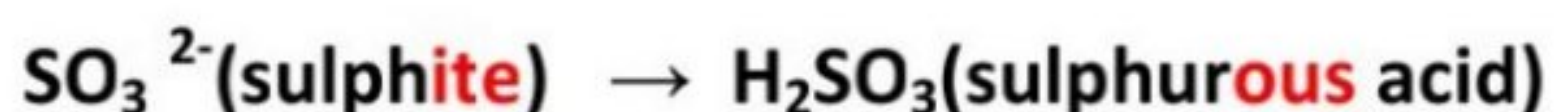
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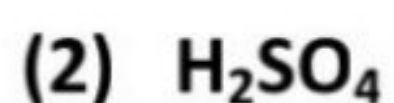
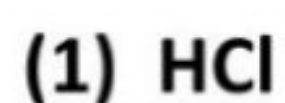
► **ite** convert to **ous**

For example

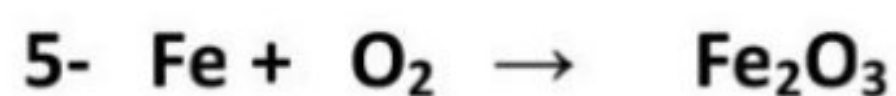
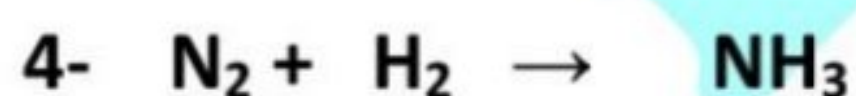


Work sheet

Naming these chemical formula

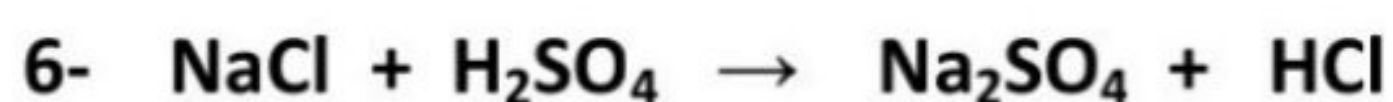


Balance the following equation :



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♠ Complete the following equation with balance:

1- sodium sulphate + silver nitrate

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.....

2- hydrochloric acid + sodium carbonate

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.....

3- nitric acid + calcium hydroxide

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4- sodium phosphate + silver nitrate

.....
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Worksheet

1- hydrochloric acid + calcium hydroxide

2- sodium nitrite + hydrochloric acid

3- sodium bicarbonate + sulphuric acid

4- silver nitrate + calcium sulphate

5- magnesium hydroxide + nitric acid

6- aluminium sulphate + sodium hydroxide