S-Block

Or electronic Configration if last electron enter in s-subshall it will be the member of s-block element.

s-block element classifiding two group :-

Group - I Group - II

The genratal electronic Configration for s-block element is ns^2

Group - I

H - 1
Li - 3
Na - 11
K - 19
Rb - 37
Cs - 55
Fr - 87

Group - II

Be - 4
Mg - 12
Ca - 20
Sr - 38
Ba - 56
Ra - 88

Study of Group - I

H → 1s¹
Li → [He] 2s¹
Na → [Ne] 3s¹
K → [Ar] 4s¹
Rb → [Kr] 5s¹
Cs → [Xe] 6s¹
Fr → [Ra] 7s¹

The genernal electronic Configration for Group - I element is ns¹.

Oxidation state :⇒

The oxidation state of Group-I always +1.

NOTE

Group-I element are know as allkelly metal because there metal Oxisides are basic in nature.

Physical state :-

accept Li all other alkely metal's are soft esilly cut with the help of nike.

The softness increase down the group.

Fr is a radio active element.

Atomic Radius :-

when we go down the group in Group-I element atomic size continously increased with increas the no. of shall.

atomic sized m

Ionization enthelpy :-

when we move up to down in group-I, Ionization enthelpy continoully decrease because atomic size increase due to which attraction b/w outermost electron and nucleus decrease.

Melting Point and boiling Point :-

The melting Point and boiling Point alkely metal dicrease when we move down the group from Li to Cs because of increase of size.

Flame Colour :-

Li : Crissom Red
Na : golden yellow
K : fel voylet
Rb : voylet
Cs : vylet

Hydration Energy :-

The order of hydration energy decrease when we move Li^{+1} to Cs so hydration energy down.

Chemical properties of Alkelly metal :-

1⇒ Reactivity towards air :-

$$M \xrightarrow{O_2} MO_2 \xrightarrow{H_2O} MOH$$

where M = Na, K, Rb, Cs

2⇒ Reactivity towards water.

$$2M + 2H_2O \longrightarrow MOH + H_2O$$

Here M = Li to Cs

Li react with water very very showly wile other alkely metal React with water vigorously.

Reactivity of Hydrogen :-

$$2M + H_2 \longrightarrow 2MH$$

(metal hydride)

i. $2Na + H_2 \longrightarrow 2NaH$ (sodium hydride)

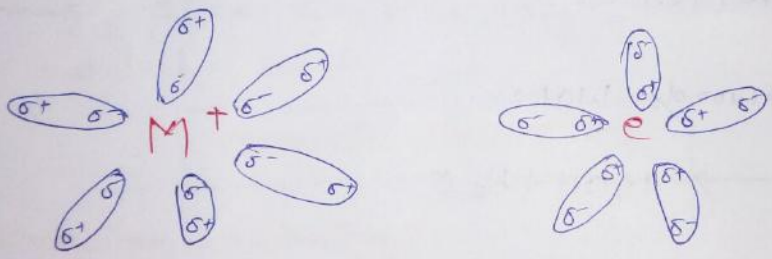
= Reaction with Helogen ⇒

$$2M + X_2 \longrightarrow 2MX$$

imp Solubility of Alkely metal with leqed Amonia:-
When Alkely metal add into liq amonia it will dessociate into ion and free electron.

$$M + \text{liq } NH_3 \longrightarrow M^+ + e^-$$
$$(\text{liq } NH_3) \quad (\text{liq } NH_3)$$

due to electron dipole force of attraction both M^+ and electron do not join again.
Know this Amoniated electron absorbed the energy from wite light source.



Ammoniate e^-
By absorbing energy this e^- transmetal blue Colour. Coressponding wave lenght there for the Solution become apaired blue.

M.Mg. Imp

Biological important of Na and K ⇒

Both Na and K ions are essential for living things (leaving organic) the daily requarment of Na and K is about 2gm each. both ion are in same in chemical activies. but biological activies there are difference.

K ion are present inside the higher consentration shall while Na+ ions are present in out side the higher consentration shall. my name

Na ion Partisipet in transmision of Nerve singnal in Regulating follow of water opeross the cell memreence.

Na ion all show isponsible for the transpotetion of ameno acid and sugar into difference cells,

K+ ions are reesponsible to increase the activies of the anzymes. K+ is all show reesponsible for the oxidation of glucose into ATP.
(Adinoseen try Phosphete.)

Na & K both are Responsible for mentaining Na & K pumb.

K & Cs are use in Photo electric cell.

Group - II

Be, Mg, Ca, Sr, Ba, Ra

The general electronic configration of Group - II is ns^2 all the metals of Group - II are non-as alkely earth metals because there oxside are basic in nature and essily availebal in earth crust.

⇒ Properties of Group - II element ⇒

1 - Occurence ⇒

all the alkeline metals are octent in earth surface in the form of oxside.

eg:- Magnesiole $MgCO_3$

esp epsom salt $MgSO_4 \cdot 7H_2O$

Calcite $CaCO_3$

Zypusum $CaSO_4 \cdot 2H_2O$

Celasilite $SrSO_4$

Heaby Spar $BaSO_4$.

Ra is Radio active.

(ii) Electronic Configration :-

Be (4) He $2s^2$

Mg (12) Ne $3s^2$

Ca (20) Ar $4s^2$

Sr (38) Kr $5s^2$

Ba (56) Xe $6s^2$

Ra (88) Rn $7s^2$

Oxidation State :-

The Oxidation state of Group-II element always +2

Atomic an ionic Radii :-

When be move Be to Ba the no. of Cell increase Continuously due to which size will alshow increase.

Physical state →

all the alkline earth metal are metalic Solid in nature they are harder then alkely metal but in its Group the Softness increase from Be to Ba. Because Be to Ba metallic Bond Strenght will decrease with increase the size.

Melting and Boiling Point :-

The MP and BP alkely of earth metal is greater then the MP and BP of alkelly metal. But in its group the MP and BP decrease from Be to Ba. Becuase of decrease of Strenght of metatic Bond.

Colour frame :-

Be

Mg

Ca Brick Red

Sr dee bred

Ba green

Ra- crimsom reed.

due to very small size of Be or Mg, it is very difficult to square the excitetation state due to which no colour is absorb.

⇒ Hydration Energy :-

Alkeline earth metal have greater hydration energy then Alkely metal because of greater charge in Alkyne earth metal family hydration energy will dicrease Be to Ba due to increase the size.

$$Be^{+2}_{aq} > Mg^{+}_{aq} > Ca^{+2}_{aq} > Sr^{+2}_{aq} > Ba^{+2}_{aq}$$

Dicreasing order of hydration Energy.

Chemical properties of Group - II ⇒

(i) Reaction with AiR

$$M + AiR\ (O_2 + N_2) \longrightarrow MO + M_3N_2$$

(Mg, Ca, Sr, Ba)

Due to large amount of ionogetion enthelpy of Be it do not react with air.

(ii) Reaction with Water :-

$$M + 2H_2O \longrightarrow M(OH)_2 + H_2\uparrow$$

Ca, Sr, Ba, React with Cold water.

Mg react with hot water.

Be do not react with water.

(iii) Reaction with Hydrogen :-

$M + H_2 \longrightarrow MH_2$

where M is Be to Ba.

(iv) Reaction with O_2 ⇒

$M + O_2 \longrightarrow MO$

M is Be to Ba.

where M is Be to Ba.

Imp Biological importants of Ca or Mg :-

An alernate body contain 25 gm Mg and 1200 gm Ca.

Mg in present in the green Ringment chlorofil which is nesesary for captary the energy from sun light.

Mg is more useful in the function of metabolic Proceses.

Ca is more useful for living orgenism it is more helpful mentainting the theeth and bones.

1% Ca is alshow responsible for Poting the blood stop. due to which the problem of hard degeat (beat) and nearu system - short out.

Diagonal Relationship :-

Diagonal Relationship is difine as the similer chemical and physical Properties of two element which are present in different Group Supcated by one Percod.

only s & p

Group - I	Group - II
Li	Be
Na	Mg
K	Ca
Rb	Sr
Cs	Ba
Fr	Ra

Li and Mg is both are Diagonally related which can we proof by the help of following point.

1- Both have almost same electro negetivity.

Li - 1 , Mg = 1.2

2- Both have almost similer size.

Li = 152 pm , Mg = 158 pm.

3- Li and Mg Both are hard metal.

4- Li and Mg Both react with water and formed

5- Hydrogen gas but the reaction is very very slow.

$$2Li + 2H_2O \longrightarrow 2LiOH + H_2$$

$$Mg + 2H_2O \longrightarrow Mg(OH)_2 + H_2$$

Both Li and Mg React with N.

$Li + N_2 \longrightarrow Li_3N$ (Litheum nitrate)

$Mg + N_2 \longrightarrow Mg_3N_2$ (magnisium nitride)

Both Li & Mg do not from double salt.

Both Li bicarbonate and Mg bicarbonate not occure in nature in stable from, they are present in solution from only.

Both Li and Mg salt are deliquescent nature

The hydro oxside of Li and Mg are less basic in nature.

Imp Diagonal Relashonship between Be and Al.

Both Be and Al metal are chemicaly and physicaly same which can be proofed by the help of following point.

1- Both Be and Al are not effected by atm.

2- both are not decompose by water.

3- Both metal oxside are emphoteric in nature.

$BeO + 2NaOH \longrightarrow BeSO_4 + H_2O$

$BeO + 2NaOH \longrightarrow Na_2BeO_2 + H_2\uparrow$

$Al_2O_3 + 6HCl \longrightarrow 2AlCl_3 + 3H_2O$

$Al_2O_3 + 3NaOH \longrightarrow 2NaAlO_2 + H_2\uparrow$

4- Both metal hydroxide are insolivle in water and on direct de-composition it will Convert into Oxicli's and water.

$$Al(OH)_3 \xrightarrow{\Delta} Al_2O_3 + H_2O$$

$$Be(OH)_2 \xrightarrow{\Delta} BeO + H_2O$$

5- Be and Al donote impart any Colour flame

6- Both metal React with N_2 with air

$$3Be + N_2 \longrightarrow Be_3N_2$$

(air) (Beryulu nyoute)

$$2Al + N_2 \longrightarrow 2AlN$$

(Alluminum nytride)

(7) Both metal nytride libsated ammoniya gas when dessolove in water.

$$Be_3N_2 + H_2O \longrightarrow NH_3\uparrow + Be(OH)_2$$

$$AlN + H_2O \longrightarrow NH_3\uparrow + Al(OH)_3$$

8- Both metal Carbonates are unstable at room temperature and Cibrated CO_2 gas.

$$BeCO_3 \xrightarrow{\text{room temp}} BeO + CO_2\uparrow$$

$$Al_2(CO_3)_3 \xrightarrow{\Delta} Al_2O_2 + CO_2\uparrow$$

9- Both Be and Al ion can Posible to make chelating Complex.

10- The compound Be and Al have a tendency to from Polymer.