Chapter 1

Basic Concept of Periodic

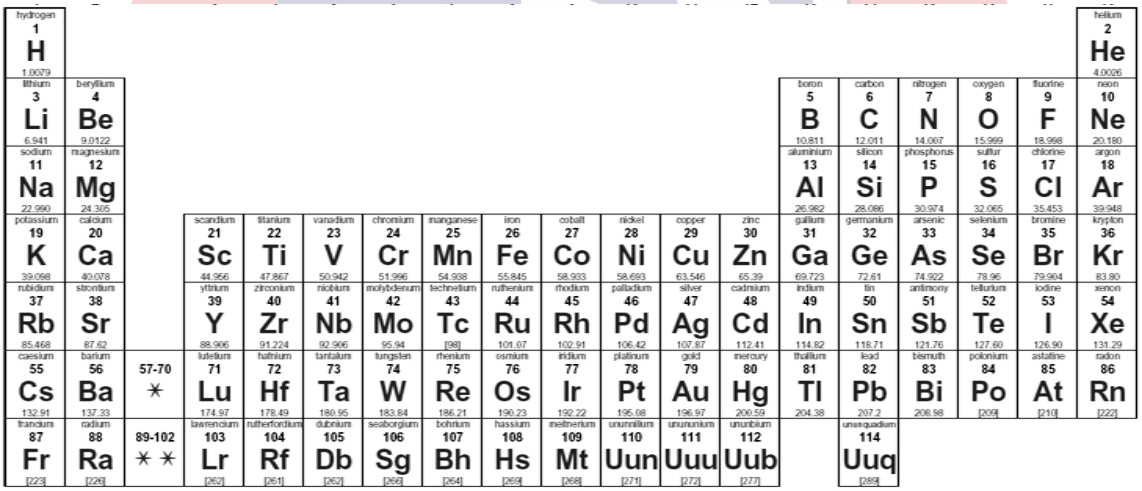
Day - 1

Periodic Table

1. Classification of Element and Periodicity in Properties

Periodic table may be defined as the table which classifies the entire known element in accordance with their properties in such a way that element with similar properties are grouped together in the same vertical columns and dissimilar element are separated from one another.

1.1 Periodic Table



1.2 Periodicity of Properties

As per ***modern periodic law,*** physical and chemical properties of the element are a periodic function of their atomic number i.e., if the element are arranged in order of their increasing atomic number the element with similar properties are repeated after certain regular intervals.

1.3 Cause of Periodicity

The main cause of periodicity in property is the repetition of similar outer electronic configuration after certain regular intervals.

1.4 Electronic Configuration of alkali Metals

SYMBOL	ATOMIC NUMBER	ELECTRONIC CONFIGURATION
Li	3	$1s^2 2s^1$ or $[He]2s^1$
Na	11	$1s^2 2s^2 2p^6 3s^1$ or $[Ne]3s^1$
K	19	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$ or $[Ar]4s^1$
Rb	37	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 5s^1$ or $[Kr]5s^1$
Cs	55	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2\ 5p^6 6s^1$ or $[Xe]6s^1$
Fr	87	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 4f^{14} 5s^2\ 5p^6 5d^{10} 6s^2 6p^6 7s^1$ or $[Rn]7s^1$

1.5 Electronic Configuration of Halogens

ELEMENT	ATOMIC NUMBER	ELECTRONIC CONFIGURATION
F	9	$1s^2 2s^2 2p^5$
Cl	17	$1s^2 2s^2 2p^6 3s^2 3p^5$
Br	35	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^5$
I	53	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^6 4d^{10} 5s^2 5p^5$
At	85	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^6 4d^{10} 4f^{14} 5s^2 5p^6 5d^{10} 6s^2 6p^5$

One most important point is that there is a repetition in the electronic configuration of noble gases i.e., regular intervals being 2,8,8,18,18,32 these number are termed as ***magic number***.

1.6 IUPAC Nomenclature Elements with at Number > 100

Roots for IUPAC nomenclature of elements.

DIGIT	ROOT	ABBREVIATION
0	nil	n
1	un	u
2	bi	b
3	tri	t
4	quad	q
5	pent	p
6	hex	h
7	sept	s
8	oct	o
9	enn	e

Z (At. No.)	Recommended Name	Symbol
101	Unnilunium (Un + nil + un + ium)	Unu
102	Unnilbium (Un + nil + bi + um)	Unb
103	Unniltrium	Unt
104	Unnilquadium	Unq
105	Unnilpentium	Unp

106	Unnilhexium	Unh
107	Unnilseptiun	Uns
108	Unniloctium	Uno
109	Unnilennium	Une
110	Ununnilium	Uun
111	Unununium	Uuu
112	Ununbium	Uub
113	Ununtrium	Uut
114	Ununquadium	Uuq
115	Ununpentium	Uup
116	Ununhexium	Uuh
117	Ununseptium	Uus
118	Ununoctium	Uuo
119	Ununenium	Uue
120	Unbinilium	Ubn

Self Efforts

1. The elements of group 1, 2, 13, 14, 15, 16, 17, 18 are collectively called
(A) Noble elements (B) Typical elements
(C) Transition elements (D) Representative elements

2. The 3rd period of the periodic table contains
(A) 8 elements (B) 32 elements
(C) 3 elements (D) 18 elements.

3. Which of the following element does not belong to the family indicated ?
(A) ${}_{24}Cu$ – Coinage metal (B) ${}_{36}Ba$ – Alkaline earth
(C) ${}_{30}Zn$ – Alkaline earth (D) ${}_{30}Xe$ – Noble gases.

4. Pd has exceptional configuration $4d^{10}\,5s^{0}$. It belongs to
(A) 4th period (B) 6th period
(C) 7th period (D) 5th period.

5. The tenth element in the periodic table resembles the element with atomic number
(A) 2 as well as 30 (B) 2 as well as 54
(C) 8 as well as 18 (D) 8 only.

6. Which of the following sequence contain atomic number of only representative elements?
(A) 3, 53, 33, 87 (B) 13, 33, 54, 83
(C) 22, 23, 66, 54 (D) 3, 13, 48, 53.

7. Which of the following set of species contains elements which have been named in honour of some countries?
(A) Ge, Bk, Cf (B) Cf, Am, In
(C) Na, Hg, Cf (D) Ru, Am, Ge.

8. According to IUPAC norms a newly discovered element has been named as Uum. The atomic number of the element is
(A) 111 (B) 112
(C) 109 (D) 110.

ANSWERS

1. D	**2.** A	**3.** C	**4.** D
5. B	**6.** A	**7.** D	**8.** D

Day - 2

1. Main Characteristics of Periodic Table

(I) Periods

7 periods.

Ist Period ⟶ 2 Elements H, He (Noble gas) shortest period

IInd Period ⟶ 8 Elements, Be, C, N, O, F, Ne, (Noble gas)

IIIrd Period ⟶ 8 Elements, Na, Mg, Al, Si, P, S, Cl, Ar, (Noble gas)

IVth Period ⟶ 18 Elements, (First long period) (Z = 19 to 36)
K Kr

Vth Period ⟶ 18 Elements, (Z = 37 – 54) Rb = 37 and Xe = 54 Z = 39 – 48 = Transition Elements

VIth Period ⟶ 32 Elements, (Z = 55 – 86) (55, 56, and 81 – 86) 8 = Normal/representative Element

(Z = 57, 72 – 80) 10 = Transition Element

Inner transition/Lanthanides (Z = 58 – 71) 14 = Rare Earth Element (Longest period)

VIIth Period ⟶ Expected 32 elements but incomplete. (Z = 86 – 62), elements after Ac, i.e., from Thorium (90) ⟶ Lawrencium (103) = actinides/rare Earth Elements.

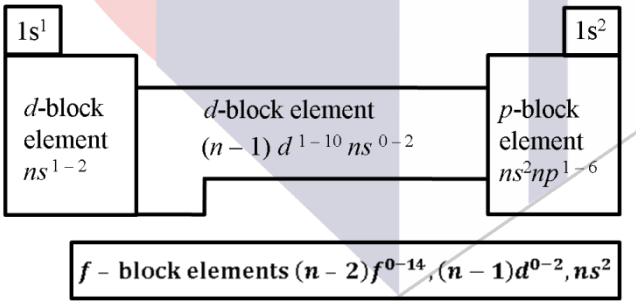
Rare Earth Elements ⟶ are also termed as f – block elements.

Elements beyond Uranium which have been prepared artificially by nuclear reaction called ***Transuranic Elements***.

(II) Groups

18 Groups,

1.1 Division of Elements into *s, p, d,* and *f* block elements



(i) *s* – block elements

Element in which last electrons enter into *s* – orbital are termed as s-block elements.

$$ns^{1-2} \quad (n = 2 - 7) \qquad [\mathrm{I}, 2^{\mathrm{nd}} \text{ group}]$$

1.2 General Properties

Soft metal with low m. p., low ionization enthalpies, highly electropositive, so reactive

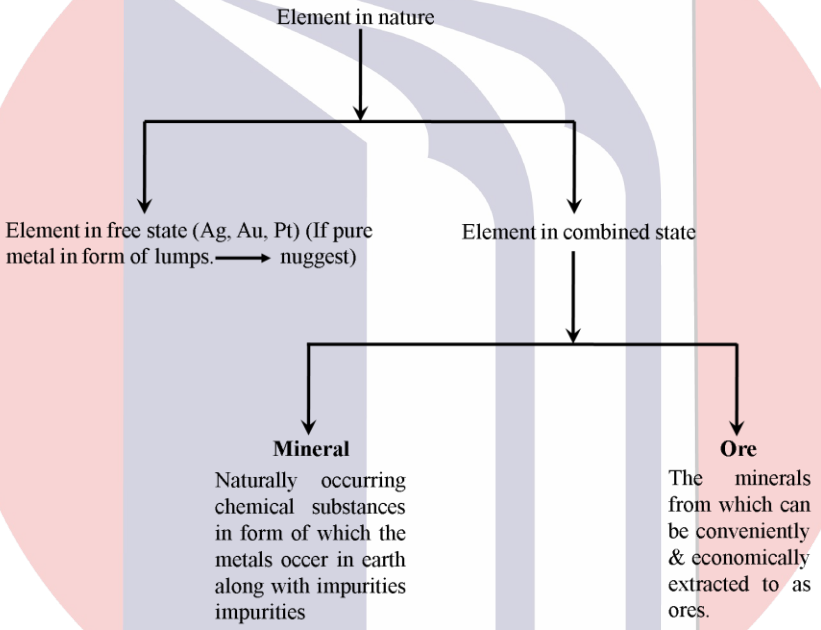
Chapter 2

Metallurgy

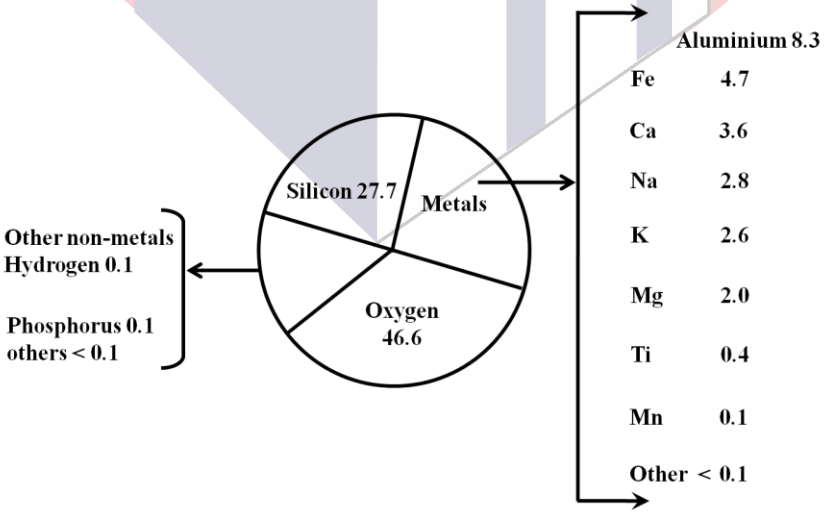
Day - 1

1. Ores and minerals

Elements are basic units of all types of matter in this universe. Elements are found to occur in nature either in the free state (native state) or in combined state (ores & minerals).



Important:- All ores are minerals but all minerals are not ores.



Percentage distribution (by weight) of the most elements in the earth's crust.

1.1 Principal Minerals/Ores of some important metals

S. No.	Metal	Minerals	Chemical formula
1.	Aluminium	Bauxite Kaolinite (a form of clay)	$AlO_x(OH)_{3-2x}$ $[0 < x < 1]$ (sometimes)$\{Al_2O_3.2H_2O\}$ $[Al_2(OH)_4Si_2O_5]$ or $[Al_2O_3.SiO_2.2H_2O]$
2.	Iron	Haemetite Magnetite Siderite Irom pyrite	Fe_2O_3 Fe_3O_4 $FeCO_3$ FeS
3.	Copper	Copper pyrites Malachite Cuprite Copper glance / Chalcocite	$CuFeS_2$ $CuCO_3.Cu(OH)_2$ Cu_2O Cu_2S
4.	Zinc	Zinc blend or Sphalerite Calamine Zincite	ZnS $ZnCO_3$ ZnO
5.	Lead	Galena Cerrusite Anglessite	PbS $PbCO_3$ $PbSO_4$
6.	Tin	Tinstone or Cassiterite	SnO_2
7.	Silver	Argentite (Silver glance) Horn Silver Pyrargyrite (Ruby Silver)	Ag_2S $AgCl$ $Ag_2S.Sb_2S_3$
8.	Magnesium	Carnalite Epsomite Small amount in sea water Magnesite Ollvine Asbestos Serpentine In minerals springs	$KCl.Mgcl_2.6H_2O$ (in sea water) $MgSO_4.7H_2O$ $MgBr_2, MgI_2$ $MgCO_3$ $MgSiO_3$ $CaMg(SiO_3)_4$ $Mg_3Si_2O_7$ $MgSO_4$

1.2 Extractive Metallurgy

The process of extracting metals from their ores is called Metallurgy. The metallurgy involves following processes

1. Crushing & grinding of ore → Just to broken the lumps of ores.

2. Concentration or benefaction of ore → The removal of unwanted earthy and siliceous impurities (gangue / matrix) from the ore is ore-dressing or concentration of ore. The process used to concentrate the ore → benefaction process.

3. Extraction of crude metal from concentrated ore.

4. Refining of ore.

1.3 Concentration of ore

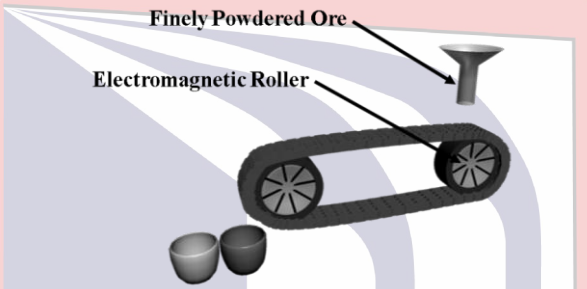
1. Hydraulic washing / Levigation / Gravity Saperation

Method is used when the ore particles are heavier than the earthy or racky particle. The process is carried out in specially designed tables called Wilgley tables.

Ex:- Oxide ore of Iron (haemelite), tin nature ore of Ag, Au etc.

2. Electromagnetic Saperation

Method is employed when either ore or impurities associated with it are magnetic in nature.



Chromite [$FeO.Cr_2O_3 = FeCr_2O_4 =$ ore of Cr], Magnetite $[Fe_3O_4]$ and pyrolusite [MnO_2 = ore of Mn] being separated from non-magnetic silicious gangue.

Tinestone / cassiterite (SnO_2) an ore of tin being non-magnetic separated from magnetic impurities like tungstates of iron and Mn.

3. Froth Floatation Method

Used for sulphide ores → ZnS, $CuFeS_2$, PbS.

Principle

Surface of sulphide ores is preferentially wetted by oil while that of gangue is preferentially wetted by water.

Working

The crushed ore mixed with water (in form of suspension) in a tank added collectors (pire oil, xanthats and fatty acids) which enhance the non-wettability of the ore particles and froth-stabilizers (Ex. Cresol & aniline) which stabilize the froth. The suspension is violently agitated by the rotating paddle which draws in air causing frothing. During this process, the ore particle becomes lighter and thus rise to the surface along with froth while gangue particles becomes heavier (wetted by water) & thus settle down at the bottom of tank. The froth is skimmed off, allowed to collapse and finally dried to the concentrated ore.

If the minerals to be concentrated consists of sulphides of two metals, then by adjusting the proportion of oil: water, it is often possible to separate ore sulphide from the other.

Depressants are used to prevent one type of sulphide ore particle from forming froth c̄ air bubble.

NaCN (d) ⇒ PbS & ZnS

Depressant On surface of ZnS

$$NaCN + ZnS \rightarrow Na_2[Zn(CN)_4].$$

On surface of ZnS $\Rightarrow$ prevent the ZnS for the froth floatation. Only PbS form froth.

4. Leaching/Hydrometallurgy

Treating the powdered ore with a suitable reagent (eg. Acids bases or other chemicals) which selectivety dissolve ore form soluble complexes but not impurity.

For:- Ag

$$4Ag + 8NaCN + O_2 + 2H_2O \longrightarrow 4Na[Ag(CN)_2] + 4NaOH$$

or $Ag_2S + 4NaCN \longrightarrow 2Na[Ag(CN)_2] + Na_2S$

Sod. Dicyanoargentate (I)

For:- Gold

$$4Au + 8KCN + O_2 + 2H_2O \longrightarrow 4K[Au(CN)_2] + 4KOH$$

Pot. Dicyanoargentate (I)

Self Efforts

1. In the floatation process for the purification of minerals the particles float because
(A) they are light
(B) they are insoluble
(C) their surface is preferentially wetted by oil
(D) they bear an electrostatic charge.

2. Froth floatation process for the concentration of ores is an illustration of the practical application of
(A) Adsorption (B) Absorption
(C) Coagulation (D) Sedimentation.

3. Which method is used for the purification of Bauxite ore ?
(A) Levigation (B) Leaching
(C) Electrolysis (D) Magnetic separation.

4. The process by which lighter earthly particles are freed from the heavier particles by washing with water is called
(A) Benefication (B) Levigation
(C) Leaching (D) None of these.

5. The most abundant element on earth crust is
(A) H_2 (B) O_2
(C) Si (D) C.

6. Which of the following is not an ore of magnesium ?
(A) Carnalite (B) Dolomite
(C) Gypsum (D) Magnesite.

7. Which of the following metals is obtained by leaching its ore with dilute cyanide solution ?
(A) Silver (B) Titanium
(C) Vanadium (D) Zinc.

8. The natural materials from which an element can be extracted economically are called
(A) Ores (B) Minerals
(C) Gangue (D) None of the above.

9. Malachite is an ore of
(A) Iron (B) Zinc
(C) Copper (D) Mercury

10. Among the following statements the incorrect one is
(A) Calamine and siderite are carbonates
(B) Argentite and cuprite are oxides
(C) Zinc blende and iron pyrites are sulphides
(D) Malachite and azurite are ores of copper.

ANSWERS

1. C	**2.** A	**3.** B	**4.** B
5. B	**6.** C	**7.** A	**8.** A
9. C	**10.** B		

Chapter 3

s-block elements

Day – 1

1. 1st group ⇒ Alkali metals

Elements	Atomic Number	Electronic Configuration	
		Complete gas core	With inert
Lithium (Li)	3	$1s^2 2s^1$	$[He]2s^1$
Sodium (Na)	11	$1s^2 2s^2 2p^6 3s^1$	$[Ne]3s^1$
Potassium (K)	19	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$	$[Ar]4s^1$
Rubidium (Rb)	37	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 5s^1$	$[Kr]5s^1$
Caesium (Cs)	55	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2 5p^6 6s^1$	$[Xe]6s^1$
Francium (Fr)	87	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 4f^{14} 5s^2 5p^6 5d^{10} 6s^2 6p^6 7s^1$	$[Rn]7s^1$

1. These elements are termed as alkali metals because they all are highly reactive which form strongly alkaline oxides and hydroxides.

2. Do not occur free in nature - because of their reactivity generally occur in combined state.

3. Alkali metals are good reducing agents - because of their low IE.

4. K & Cs are used in photo electric cells - because of their Low IE, they can eject e^- when exposed to light. Li – has highest IE, cannot be used in photo electric cell because does not release e^- when exposed to light.

1.1 Chemical Properties

1. Reactivity and electrode potential

All alkali metals are highly reactive because they have a strong tendency to lose the singly valence e^- to form unipositive ion → inert gas configuration. It is the main reason that alkali metals act as a good reducing agent.

Reducing character in gaseous state - Li < Na < K < Rb < Cs.

Reducing character in aqueous solution - Na < K < Rb < Cs < Li (due to higher –tive value of E^0)

Reason

(i) $Li(s) \longrightarrow Li(g)$ (sublimation energy)

(ii) $Li(g) \longrightarrow Li^+(g)$

(iii) $Li^+(g) + aq. \longrightarrow Li^+(aq.)$ + enthalpy of hydration

The overall tendency for the charge depends upon the net effect of all the three steps.

Li^+ has smallest size and is hydrated maximum therefore large amount of hydration energy released in third step. The amount is so large (in third step) that it compensates the higher energy needed to remove e^- (in second step).

So net effect is

$$Li(s) \longrightarrow Li^+(aq.) + e^- \text{ occure easily.}$$

2. Reactivity with water

$$2Li + 2H_2O \longrightarrow 2LiOH + \mathbf{H_2} \uparrow$$
$$2Na + 2H_2O \longrightarrow 2NaOH + \mathbf{H_2} \uparrow$$
$$2K + 2H_2O \longrightarrow 2KOH + \mathbf{H_2} \uparrow$$
$$2Rb + 2H_2O \longrightarrow 2RbOH + \mathbf{H_2} \uparrow$$
$$2Cs + 2H_2O \longrightarrow 2CsOH + \mathbf{H_2} \uparrow$$

Here H_2 catch fire. Because of large reduction potential and Li is least reactive.

$$2M + 2H_2O \longrightarrow 2MOH$$
$$2M + 2C_2H_5OH \longrightarrow 2C_2H_5OM + H_2$$
$$2M + HC \equiv CH \longrightarrow M^+ - C^- \equiv C^- - M^+ + H_2$$

Alkali metal acetylic

Imp.:- Not found in any other group because of presence of acidic hydrogen in compounds.

3. Reactivity towards oxygen

$$M \xrightarrow{O_2} \underset{\text{Oxide } (Li_2O)}{M_2O} \xrightarrow{O_2} \underset{\text{Peroxide } (Na_2O_2)}{M_2O_2} \xrightarrow{O_2} \underset{\text{Super oxide (K, Rb, Cs)}}{MO_2}$$

Li^+ ion being a small ion has a strong positive field around it can stabilize only a small anion O^{2-} where as Na^+ being large cation stabilize a large anion.

Large K^+, Rb^+ and Cs^+ ions have still weaker +tive field around them which cannot prevent even peroxide ion O_2^{2-} to combine e^- another oxygen atom to form superoxide O_2^-

$$\underset{\text{Oxide}}{O_2^-} \xrightarrow{V_2O_2} \underset{\text{Peroxid}}{O_2^{2-}} \xrightarrow{O_2} \underset{\text{Superoxid}}{2O_2^-}$$

$Na_2O_2 \rightarrow$ widely used as an oxidizing agent in Inorganic Chemistry.

$LiO_2, NaO_2 \Rightarrow$ yellow
$KO_2 \Rightarrow$ Orange
$RbO_2 \Rightarrow$ Brown
$CsO_2 \Rightarrow$ Orange

→ Coloured & paramagnetic
→ Superoxide

4. Alkali metals get tarnished when exposed to air & moisture

Because they converted themselves into oxides, hydroxides & finally into carbonates

$$4M + O_2 \longrightarrow 2M_2O$$
$$M_2O + H_2O \longrightarrow 2MOH$$
$$MOH + CO_2 \longrightarrow MCO_3 + H_2O$$

Because of it alkali metals stored in inert hydrocarbon solvents/petroleum ether/kerosene oil.

5. Reactivity with H_2

Forms hydrides. When react with H_2 at 673K (1023K) ⇒ Ionic hydrides $[M^+H^-]$.

1. Order of reactivity of alkali metal with H_2 ↓ decreases (due to lattice energy).

2. Ionic character of MH ↓ decreases, covalent character increases. Because the size of cation increases, the anion hydride ion can polarize the more easily.

3. Hydrides act as a strong reducing agent liberate H_2 at anode.

4. Hydrides act with proton donor such as water, alcohols, gaseous ammonia & alkynes liberate H_2 gas.

LiH:- Used as a source of H_2 for millitory purpose and for filling metrological balloons since it has low molecular weight.

6. Reactivity with halogens

$$2M + X_2 \longrightarrow 2M^+X^-$$
$$M = Li \longrightarrow Cs$$
$$X = F, Cl, Br \ \& \ I$$

Reactivity increases ↓due to low IE

$$F_2 > Cl_2 > Br_2 > I_2$$

7. Solubility in liquid Ammonia

$$M^+ + (x+y)NH_3 \longrightarrow M^+(NH_3)_x + e^-(NH_3)_y$$

When ordinary light falls in the solution of alkali metal in ammonia, these ammoniated electron get excited to higher level by absorbing energy of red region. The transmitted light is blue which imparts blue colour to the solution.

1. When concentration increases above 3M colour change ⟶ Copper bronz ⟶ solution acquire metallic luster ⟶ due to formation of metal ion cluster.

2. Blue solution ⟶ paramagnetic ⟶ presence of unpaired electrons bronze solution ⟶ diamagnetic due to formation of electron cluster.

$$2e^-(NH_3)_y \longrightarrow [\uparrow e^-(NH_3)_y][\downarrow e^-(NH_3)_y]$$

3. The solution is good conductor of electricity due to presence of ammoniated electron & cations. After increase in conc ⟶ conductivity ↓ decrease because M^+- bound free unpaired electrons.

4. 2n positiveness of impurities (Fe) or catalyst.

$$2M^+(NH_3)_x + 2e^-(NH_3)_y \longrightarrow \underset{\text{Metal Amide}}{M^+NH_2^-} + H_2^- \uparrow + (x+y-2)NH_3$$

8. Oxides & hydroxides

$$2Na + 2H_2O \longrightarrow 2NaOH + H_2$$
$$Na_2O + H_2O \longrightarrow 2NaOH$$
$$K_2O + H_2O \longrightarrow 2KOH$$
$$Na_2O_2 + 2H_2O \longrightarrow 2NaOH + H_2O_2$$
$$2K_2O_2 + 2H_2O \longrightarrow 4KOH + O_2$$
$$2KO_2 + 2H_2O \longrightarrow 2KOH + H_2O_2 + O_2$$
$$Na_2O_2 + 2HCl \longrightarrow 2NaCl + H_2O_2$$
$$Na_2O_2 + H_2SO_4 \longrightarrow Na_2SO_4 + H_2O_2$$

Basic character of oxide

Increases due to low IE

1.2 Anomalous behaviour of Li

1. Very small size of atom/ion.

2. Higher polarizing power (due to high charge/size ratio) resulting in increased covalent character of their compound responsible for their solubility in organic solvents.

3. Comparatively high I.E. & low electropositive character.

4. Non availability of d-orbital.

5. Strong intermetallic bonding.

Resemblance of Li with Mg (Diagonal relationship)

Mainly due to the similarity in sizes of their atoms (Li = 152 pm, Mg = 160 pm) & their ions (Li^+ = 76 pm & Mg^{2+} =72 pm). (Similar changes radius ratio.)

1.3 Similarities

1. Similar electronegativity (Li = 0.98 & Mg = 1.2).

2. Both are very hard.

3. $Li(OH)$ & $Mg(OH)_2$ $\Longrightarrow$ weak bases.

4. Form Nitrides $3Mg + N_2 \longrightarrow Mg_3N_2$

$6Li + N_2 \longrightarrow 2Li_3N$

5. Hydroxides & carbonates decompose on heating.

$$2Li(OH) \xrightarrow{\Delta} LiO + H_2O$$
$$Mg(OH_2) \longrightarrow MgO + H_2O$$
$$2LiCO_3 \longrightarrow Li_2O + 2CO_2$$
$$2MgCO_3 \longrightarrow 2MgO + 2CO_2$$

6. Can form only oxides not peroxide or superoxides.

$$4Li + O_2 \longrightarrow 2Li_2O$$
$$2Mg + O_2 \longrightarrow 2MgO$$

7. Nitrates decompose on heating and give NO_2.

$$4Li(NO_3) \longrightarrow 2Li_2O + 4NO_2 + O_2$$
$$Mg(NO_3)_2 \longrightarrow MgO + NO_2 + O_2$$

8. Hydroxides, carbonates, oxalates, phosphates, fluoride $\longrightarrow$ sparingly soluble in water.

9. Do not form solid bicarbonates (due to large size of bicarbonates).

10. Covalent character of LiCl & $MgCl_2$ $\longrightarrow$ soluble in ethanol, deliquescent & crystalline from aq. Solution as hydrates $LiCl.2H_2O$ & $MgCl_2.6H_2O$.

1.4 Imp. Points

1. Except Cs_2O $\Longrightarrow$ anti $CdCl_2$ layer structure, all other monoxides- LiO_2, Na_2O, K_2O & RbO_2 $\Longrightarrow$ Anti – fluorite structure.

2 KO_2, used as a source of oxygen in submarine, space shuttle & in emergency breathing apparatuses i.e., oxygen mask.

$$4KO_2 + 2H_2O \longrightarrow 4KOH(aq.) + 3O_2(g)$$

From breathe

$$2KO_2 + 2H_2O \longrightarrow 2KOH + H_2O_2 + O_2$$

$$KOH(aq.) + CO_2(g) \longrightarrow KHCO_3$$

3. LiOH is used to remove CO_2 from exhaled air in confirmed quarters like submarine and space vehicles.

4. Li cannot be store in paraffin because of its low density it will float. It is kept wrapped in paraffin wax.

5. All Alkali metals exist as bcc with co-ordination no. 8.

6. Formation of Amalgam with Hg & Alkali metals are highly exothermic reaction.