

Physical Properties

- Atomic radii/Ionic radii: Increases with increase in atomic no.
- Ionization energy: Decreases down the group.
- Density increases down the group.

- General electronic configuration: (Noble gas) ns^1
- Belong to group 1 of the periodic table.
- Low M.P. and B.P.
- Forms ionic compound.

- Flame colour:
 - Li: Crimson red
 - Na: Yellow, K: Lilac
 - Rb: Red, Cs: Blue
- Low M.P. and B.P.

Anomalous behaviour of Li is due to:

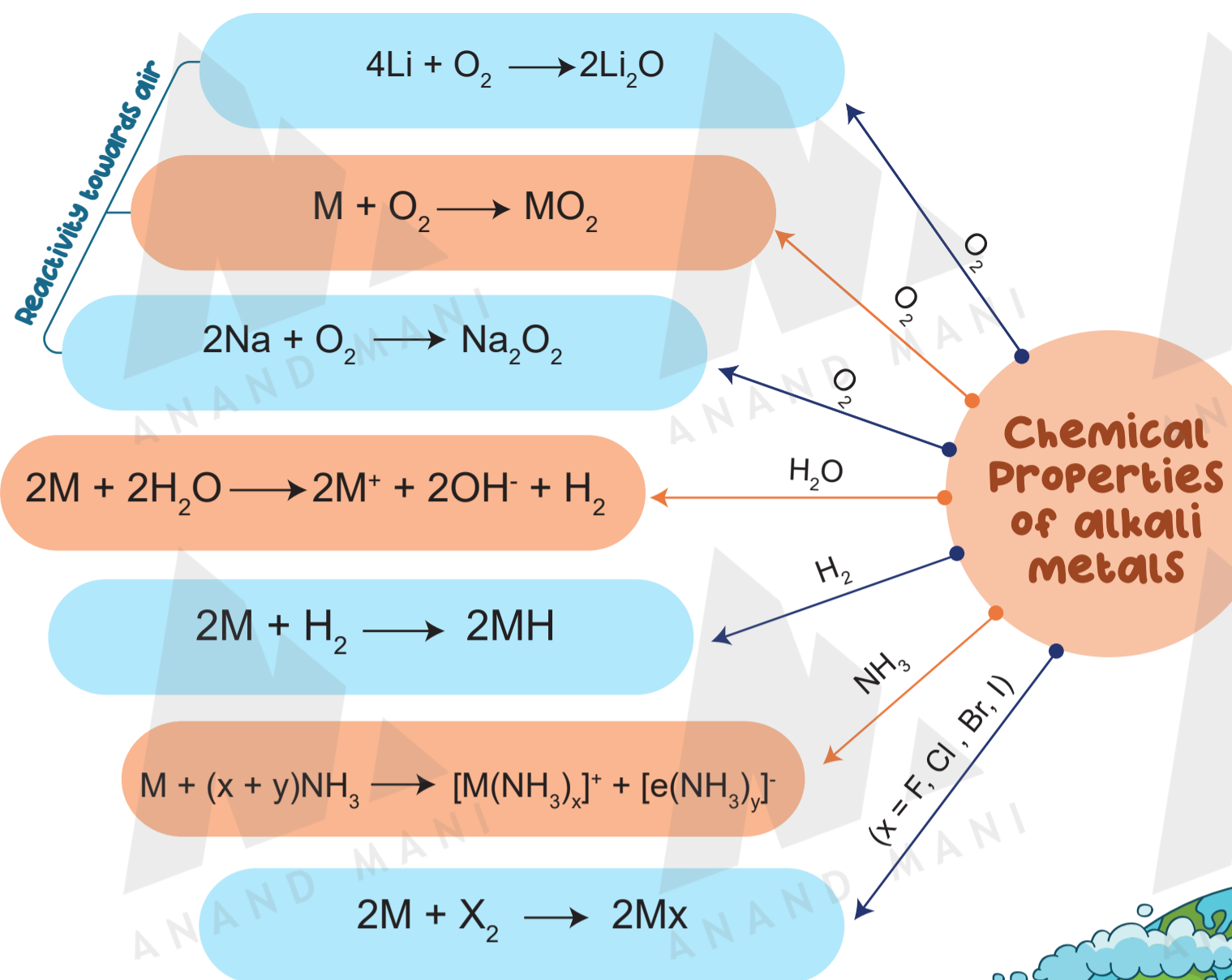
- Exceptionally small size of its atom and ion.
- Absence of d orbital.
- High polarizing power.

Biological importance of Na and K

- Sodium ions participate in cellular signals, transmission and regular flow of water across cell membranes.
- K ions active many enzymes and oxidise of glucose to produce ATP.

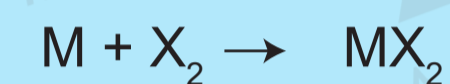
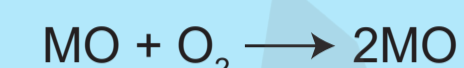
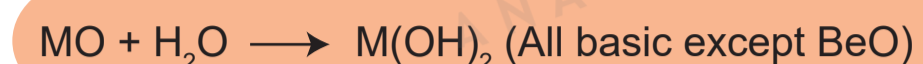
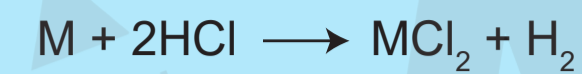
USES

- Li is used to make alloys.
- KCl is used as fertilizer.
- Cs is used in devising photoelectric cells.
- Liquid Na metal is used as coolant in nuclear reactors.



Chemical Properties of alkaline earth metals

Be & Mg are kinetically inert to O_2 & H_2O .



Physical Properties

- Atomic & Ionic radii: Smaller than the corresponding alkali group, increases with increase in atomic number.
- I.E.: I.E., higher than corresponding alkali metals.

- Density: It decreases from Be to Ca & increases from Ca to Ra.
- General electronic configuration (Noble gas) ns^2
- Forms ionic compounds except (Be.)

- Belong to Group 2 of the periodic table.
- Flame colour:
 - Ca - Brick red.
 - Sr - crimson red.
 - Ba - Apple green.
- Higher M.P. & B.P. than corresponding alkali metals.

Uses

- Be is used to manufacture alloys.
- Ca in extraction of metals.
- Mg-Al alloys are used in aircraft construction.
- Ra is used in radio therapy.

Biological importance of Mg and Ca

- All enzymes that utilise ATP in phosphate transfer requires Mg as co-factor. Chlorophyll contains Mg.
- Ca is present in bones and teeth.

Alkali Metals

6 Li 3	23 Na 11	39 K 19	85 Rb 37	132 Cs 55	223 Fr 87
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Alkaline Earth Metals

9 Be 4	24 Mg 12	40 Ca 20	87 Sr 38	137 Ba 56	226 Ra 88
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The S-Block Elements

Sodium Chloride (NaCl)

- Obtained from sea water.
- It is used in the preparation of Na_2O_2 , NaOH and Na_2CO_3 .

Important Compounds of Sodium

Sodium bicarbonate (NaHCO_3)

- Commonly known as baking soda.
- Prepared by saturating a solution of Na_2CO_3 with CO_2 .
- Used in fire extinguishers and baking of cake.
- Used in baking common food products.

Sodium carbonate ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$)

- Commonly known as washing soda.
- Prepared by Solvay's process.
- Used for washing, cleaning etc.

Sodium hydroxide (NaOH)

- Commonly known as caustic soda.
- Prepared by electrolysis of brine solution.
- Used in preparation of soap, paper etc.

Calcium Oxide (CaO)

- Commonly known as quick lime.
- Prepared by heating lime stone.
- Used to manufacture cement and dye stuffs.

Important Compounds of Calcium

Calcium hydroxide ($\text{Ca}(\text{OH})_2$)

- Commonly known as slaked lime.
- Prepared by adding water to quick lime.
- Used in white washing etc.

Calcium carbonate (CaCO_3)

- Commonly known as lime stone.
- Prepared by passing CO_2 through slaked lime.
- Used to manufacture paper etc.

Anomalous behaviour of Beryllium is due to:-

- Small size
- High ionisation enthalpy
- Absence of d-orbitals