

LiNa Ki Rab Cse Friendship

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In the s-block elements the last electron enters in the s-orbitals.

As the s-orbitals can accomodate only two electrons, two groups (1 and 2) belong to the s-block.

s-Block Elements

Group-1 (Alkali Metals)

Group-I elements have one electron in their valence shell. They do not occur in the native or free state. These elements are collectively known as alkali metals because their oxides and hydroxides form strong alkalis like NaOH, KOH, etc.

Q. Why are alkali metals not found in nature?

[NCERT Exercise]

Sol. Alkali metals are highly reactive in nature. That's why they always exist in combined state in nature.

1. Electronic configuration: ns^1 (Practice Questions in the End, Q.1, 2, 3, 4, 7, 10, 11, 16)

2. Physical state : Silvery white, soft and light

3. Atomic and ionic radii, volume : $Li < Na < K < Rb < Cs < Fr$

4. Density : Densities are quite low and increases from Li to Cs but K is lighter than Na due to unusual increase in atomic size. Li, Na and K are lighter than water.

Density : $Li < Na > K < Rb < Cs < Fr$

5. Melting point and boiling points: Decrease in melting and boiling point from Li to Cs due to weak intermetallic bonding.

Q. The alkali metals are low melting. Which of the following alkali metal is expected to melt if the room temperature rises to 30°C ?

[NCERT Exemplar]

(a) Na (b) K (c) Rb (d) Cs

Sol: (d) Among alkali metals, melting point decreases as the strength of metallic bonding decreases with increasing size of the atom. Thus, Cs has the lowest melting point (28.5°C) and will melt at 30°C .

6. Metallic character : $Li < Na < K < Rb < Cs$

7. Conductivity : Good conductor.

8. Oxidation state : +1 oxidation state.

9. Ionization enthalpy : $Li > Na > K > Rb > Cs > Fr$ (Due to increase in atomic size).

10. Hydration of ions : Smaller the size of cation, greater degree of hydration

Radius in gas phase : $Li^+ < Na^+ < K^+ < Rb^+ < Cs^+$.

Degree of hydration : $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$.

Radius in aqueous : $Li^+_{(aq.)} > Na^+_{(aq.)} > K^+_{(aq.)} > Rb^+_{(aq.)} > Cs^+_{(aq.)}$.

Hydration Energy : $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$.

- Li^+ has maximum degree of hydration and for this reason lithium salts are mostly hydrated, e.g., $LiCl \cdot 2H_2O$

11. The alkali metals are good conductors of heat and electricity.

12. Alkali metals (except Li) exhibit photoelectric effect.

Q. Why are potassium and caesium, rather than lithium used in photoelectric cells?

[NCERT Exercise]

Sol. Potassium and caesium have much lower ionization enthalpy than that of lithium. As a result, these metals easily emit electrons on exposure to light. Due to this, K and Cs are used in photoelectric cells rather than lithium.

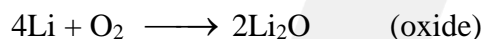
13. Flame Test :

Li	Crimson
Na	Yellow
K	Pale violet
Rb	Red violet
Sc	Blue

14. Reducing property: Strong reducing agent. Li is strongest reducing agent in solution.

Chemical Properties

(a) **Reactivity towards air :** The superoxide O_2^- ion is stable only in the presence of large cations such as K, Rb, Cs.



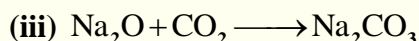
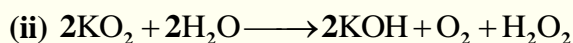
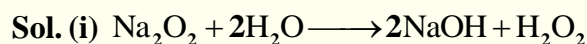
(b) **Reactivity towards water :** All the alkali metals, their oxides, peroxides and superoxide's readily dissolve in water to produce corresponding hydroxides which are strong alkalis.

- $2Na + 2H_2O \longrightarrow 2NaOH + H_2$
- $Na_2O + 2H_2O \longrightarrow 2NaOH$
- $Na_2O_2 + 2H_2O \longrightarrow 2NaOH + H_2O_2$
- $2KO_2 + 2H_2O \longrightarrow 2KOH + H_2O_2 + O_2$

Q. Write balanced equations for reactions between.

[NCERT Exercise]

(i) Na_2O_2 and water (ii) KO_2 and water (iii) Na_2O and CO_2



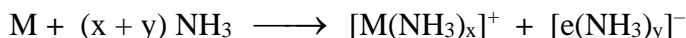
(c) **Reducing nature:** The alkali metals are strong reducing agents, lithium being the most and sodium the least powerful. The standard electrode potential (E°) which measures the reducing power represents the overall change :

- $M(s) \longrightarrow M(g)$ sublimation enthalpy

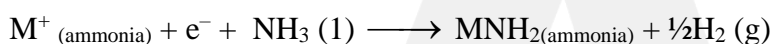
- $M(g) \longrightarrow M^+(g) + e^-$ ionization enthalpy
- $M^+(g) + H_2O \longrightarrow M^+(aq)$ hydration enthalpy

With the small size of its ion, lithium has the highest hydration enthalpy which accounts for its high negative E° value and its high reducing power.

(d) **Solution in liquid ammonia :** The alkali metals dissolve in liquid ammonia giving deep blue solutions which are conducting in nature.



- The blue colour of the solution is due to the ammoniated electron which absorbs energy in the visible region of light and thus imparts blue colour to the solution.
- The solutions are paramagnetic and on standing slowly liberate hydrogen resulting in the formation of amide.

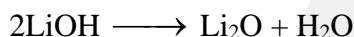


- In concentrated solution, the blue colour changes to bronze colour and becomes diamagnetic.

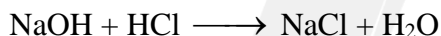
(e) The basic strength of these hydroxides increases as we move down the group Li to Cs.



(f) All these hydroxides are highly soluble in water and thermally stable except lithium hydroxide.



(g) Alkali metals hydroxides being strongly basic react with all acids forming salts.



Halides of Alkali metals:

- $M_2O + 2HX \longrightarrow 2MX + H_2O$ (M = Li, Na, K, Rb or Cs)
- $MOH + HX \longrightarrow MX + H_2O$ (X = F, Cl, Br or I)
- $M_2CO_3 + 2HX \longrightarrow 2MX + CO_2 + H_2O$

Anomalous Behaviour of Lithium

Lithium, the first member of alkali metals differs in many properties from the other alkali-metals due to the following reasons:

- Li has smallest atomic and ionic size in the group.
- Li^+ has highest polarizing power in its group which makes its compounds covalent.
- Li has highest ionization energy, high heat of hydration, highest electro-negativity or minimum electropositive character in its group.
- Li does not have d-orbitals also.

Difference between lithium and other alkali metals

- Lithium is harder and higher than other alkali metals due to strong metallic bonding.
- Its m. pt. and b. pt are higher than the rest of alkali metals.

- (iii) Li on burning in air or oxygen forms monoxide while other alkali metals form higher oxides like peroxides and superoxide's.
- (iv) LiHCO_3 does not exist as solid but it occurs in solution. Other alkali metals bicarbonates are known in solid state.

Q. In what ways lithium shows similarities to magnesium in its chemical behaviour?

[NCERT Exercise]

Sol. They both (Li and Mg) are diagonally placed in periodic table. So they have similar chemical behaviour.

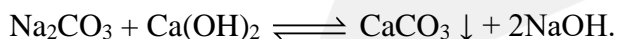
1. Both react with nitrogen to form nitrides.
2. Both react with O_2 to form monoxides.
3. Both the elements have the tendency to form covalent compounds.
4. Both can form hydrated salts. For example : $\text{LiCl} \cdot 2\text{H}_2\text{O}$ & $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$

Some important compounds of alkali metals

Sodium Hydroxide, NaOH (Caustic soda)

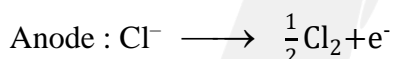
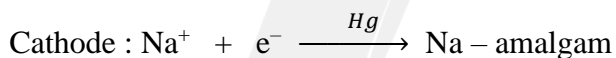
1. Causticization process (Gossage process)

This process involves heating of sodium carbonate with milk of lime

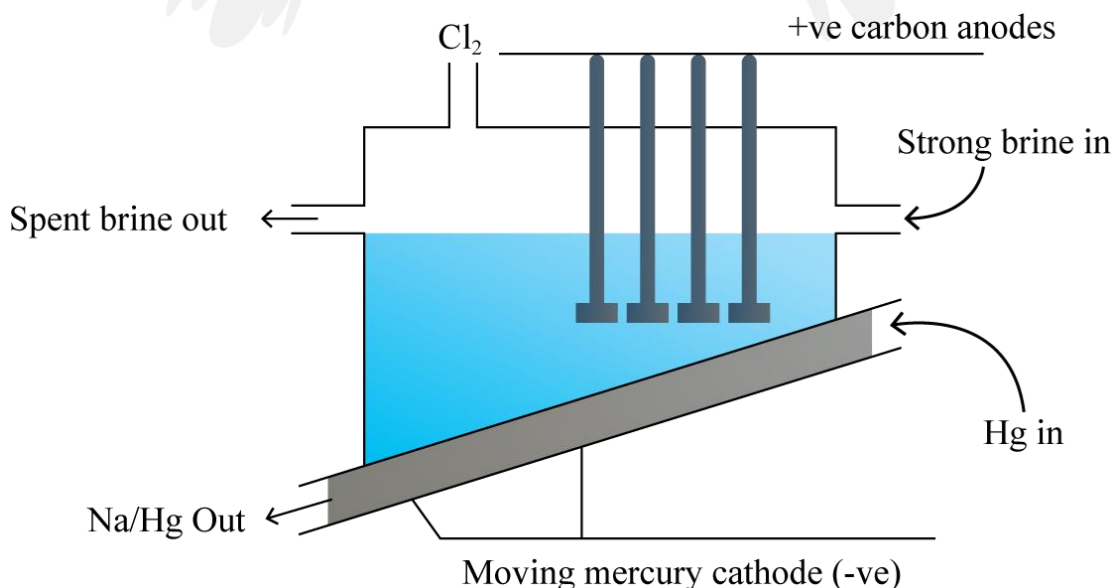
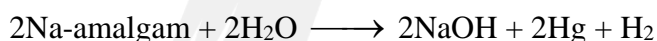


2. Electrolysis of NaCl in Castner-Kellner cell.

Electrolysis of saturated aqueous solution of NaCl gives NaOH, Cl_2 and H_2 .



The amalgam is treated with water to give sodium hydroxide and hydrogen gas.



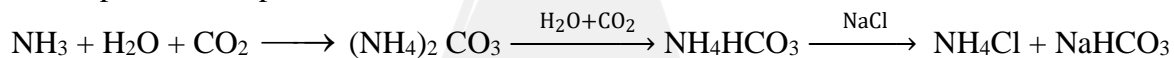
Properties:

Sodium hydroxide is a white translucent solid, it is readily soluble in water. Crystals of NaOH are deliquescent (tendency to absorb moisture from the air and dissolve in it).

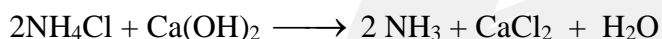
Sodium Carbonate Decahydrate $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ (Washing soda)

Preparation

- Sodium carbonate is manufactured by Solvay process which is efficient and economic.
- In this process, advantage is taken of the low solubility of sodium hydrogencarbonate whereby it gets precipitated in the reaction of sodium chloride with ammonium hydrogencarbonate.
- In this process compounds used as raw material are brine NaCl, NH_3 and CaCO_3 .



- In this process NH_3 is recovered when the solution containing NH_4Cl is treated with $\text{Ca}(\text{OH})_2$. Calcium chloride is obtained as a by-product.



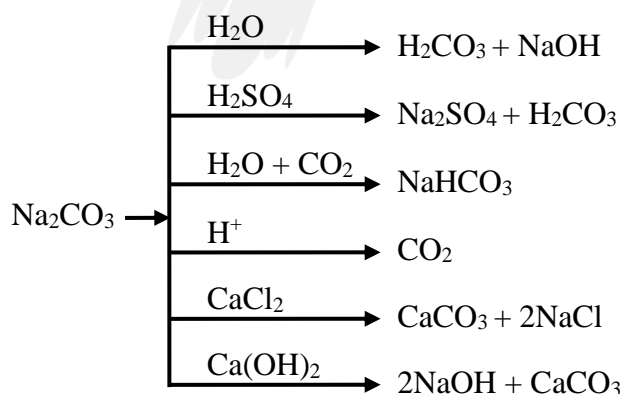
Sodium Hydrogen carbonate Baking Soda NaHCO_3

Sodium hydrogen carbonate is made by saturating a solution of sodium carbonate with carbon dioxide. The white crystalline powder of sodium hydrogencarbonate, being less soluble, gets separated out.



Uses: Sodium hydrogencarbonate is a mild antiseptic for skin infections. It is used in fire extinguishers.

Chemical Reaction:



Group-2

Group-II (Alkaline Earth Metal)

(Practice Question in the End, Q.5, 6, 9, 12, 13, 14, 15)

1. **Electronic configuration** : ns^2

2. **Atomic and ionic radii, volume** : Small compared to Group I (due to extra nuclear charge).

Atomic and ionic radii increases from Be to Ra. Volume increases from Be to Ra.

Atomic radius : $\text{Be} < \text{Mg} < \text{Ca} < \text{Sr} < \text{Ba} < \text{Ra}$.

3. **Density**: Greater than alkali metals. Do not show regular trend due to difference in crystal structure. Decreases from Be to Ca and increases upto Ra.

4. **Melting point and boiling points**: Decreases from Be to Ba.

5. **Metallic character** : Less compared to group-I.

Metallic character : $\text{Be} < \text{Mg} < \text{Ca} < \text{Sr} < \text{Ba} < \text{Ra}$.

6. **Conductivity**: Good conductor.

7. **Oxidation state**: +2 oxidation state.

8. **Ionization enthalpy**: Greater than alkali metals. Decreases down the group.

9. **Hydration of ions**: Smaller the size of cation, greater hydration.

Degree of hydration : $\text{Be}^{+2} > \text{Mg}^{+2} > \text{Ca}^{+2} > \text{Sr}^{+2} > \text{Ba}^{+2} > \text{Ra}^{+2}$.

The hydration enthalpies of alkaline earth metal ions are larger than those of alkali metal ions.

Thus, compounds of alkaline earth metals are more extensively hydrated than those of alkali metals, e.g., MgCl_2 and CaCl_2 exist as $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ and $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$ while NaCl and KCl do not form such hydrates.

10. **Flame Test** : Beryllium and Magnesium do not impart any colour to the flame as their atoms are smaller and consequently require higher energies for excitation of the electrons to higher levels.

Ca	Brisk red
Sr	Crimson red
Ba	Grassy green
Ra	Crimson

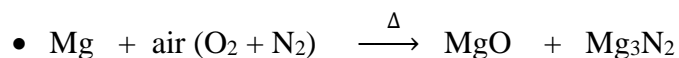
Chemical Properties

Reaction with water:

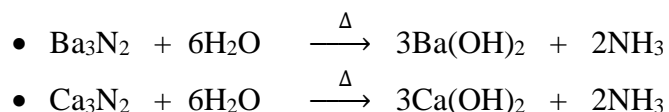
- $\text{Mg} + \text{H}_2\text{O} \longrightarrow \text{MgO} + \text{H}_2$
- $\text{Mg} + 2\text{H}_2\text{O} \longrightarrow \text{Mg(OH)}_2 + \text{H}_2$
- $\text{Ca} + 2\text{H}_2\text{O} \longrightarrow \text{Ca(OH)}_2 + \text{H}_2$

Formation of oxides and nitrides:

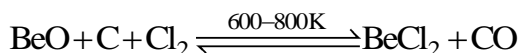
- $\text{Be} + \text{O}_2 \xrightarrow{\Delta} 2\text{BeO}$
- $3\text{Be} + \text{N}_2 \xrightarrow{\Delta} \text{Be}_3\text{N}_2$



Reaction of nitrides:

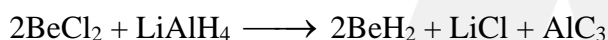


(ii) **Reactivity towards the halogens** : Thermal decomposition of $(\text{NH}_4)_2\text{BeF}_4$ is the best route for the preparation of BeF_2 , and BeCl_2 is conveniently made from the oxide.



(iii) **Reactivity towards hydrogen**: All the elements except beryllium combine with hydrogen upon heating to form their hydrides, MH_2 .

BeH_2 , however, can be prepared by the reaction of BeCl_2 with LiAlH_4 .



(v) **Reducing nature**: Like alkali metals, the alkaline earth metals are strong reducing agents.

(vi) **Solutions in liquid ammonia**: Like alkali metals, the alkaline earth metals dissolve in liquid ammonia to give deep blue black solutions forming ammoniated ions.

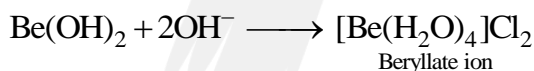


(i) **Oxides and Hydroxides**: All these oxides except BeO are basic in nature and react with water to form sparingly soluble hydroxides.



The solubility, thermal stability and the basic character of these hydroxides increase with increasing atomic number from Mg(OH)_2 to Ba(OH)_2 .

Beryllium hydroxide is amphoteric in nature as it reacts with acid and alkali both.



(ii) **Halides**: In the vapour phase BeCl_2 tends to form a chloro-bridged dimer which dissociates into the linear monomer at high temperatures of the order of 1200 K.

Anomalous Behaviour of Beryllium

- Be is harder than other members of its group.
- Be is lighter than Mg.
- Its melting and boiling points are higher than those of Mg & other members.
- Be does not react with water while Mg reacts with boiling water.
- BeO is amphoteric while MgO is weakly basic.
- Be forms covalent compounds whereas other members form ionic compounds.

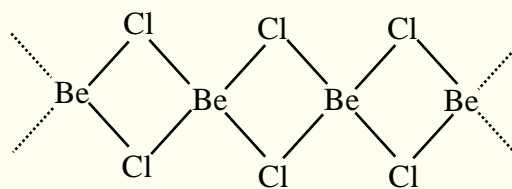
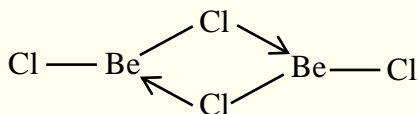
Q. Draw the structure of (i) BeCl_2 (vapour), (ii) BeCl_2 (solid).

[NCERT Exercise]

Sol. BeCl_2 (vapour)

BeCl_2 (solid)

In the vapour state, it exists as a chlorobridged dimer.



Q. Metals form basic hydroxides. Which of the following metal hydroxide is the least basic?

(a) $\text{Mg}(\text{OH})_2$

(b) $\text{Ca}(\text{OH})_2$

[NCERT Exemplar]

(c) $\text{Sr}(\text{OH})_2$

(d) $\text{Ba}(\text{OH})_2$

Sol: (a) As the ionization enthalpy increases from $\text{Mg} \longrightarrow \text{Ba}$, the $\text{M}-\text{O}$ bond becomes weaker and weaker down the group and hence basicity increases down the group. Thus, $\text{Mg}(\text{OH})_2$ is least basic.

Q. Some of the Group 2 metal halides are covalent and soluble in organic solvents. Among the following metal halides, the one which is soluble in ethanol is [NCERT Exemplar]

(a) BeCl_2

(b) MgCl_2

(c) CaCl_2

(d) SrCl_2

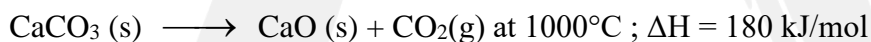
Sol: Due to small size, high electronegativity and high ionization enthalpy of Be, BeCl_2 is covalent and hence most soluble in organic solvents such as ethanol.

Important Compounds of Alkaline earth metals

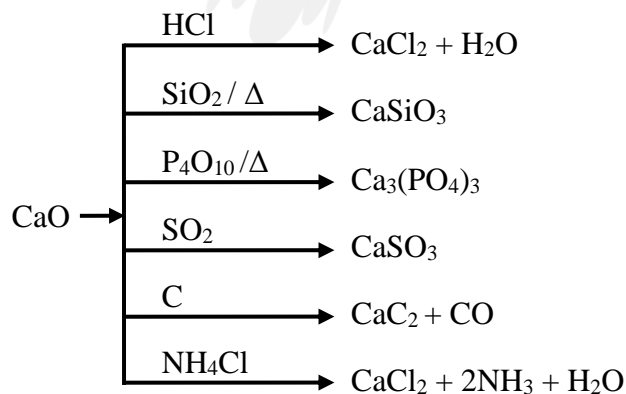
Calcium oxide (CaO) or Quick Lime

Quick lime (CaO) is prepared by strong heating of lime stone (CaCO_3) in lime kiln.

Smaller piece of limestone are introduced from the top and heating is done from lower end. Lime stone decomposes at about 1000°C to give calcium oxide.



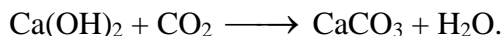
Chemical Reaction:



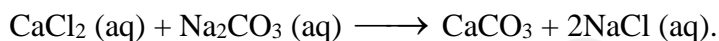
Calcium Carbonate (CaCO₃)

Preparation

- Calcium carbonate is prepared in the laboratory by passing carbon dioxide gas into lime water.

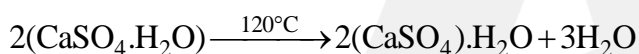


- Calcium carbonate is also obtained by adding the solution of a soluble carbonate to soluble calcium salt.

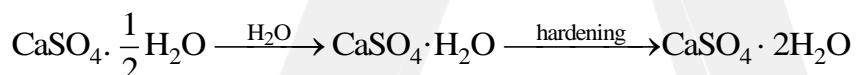


Plaster of Paris (CaSO₄ · ½ H₂O)

- Calcium sulphate with half molecule of water per molecule of the salt (semi-hydrate) is called plaster of paris.
- It is prepared by heating gypsum (CaSO₄ · 2H₂O) at 120°C in rotary kilns, where it gets partially dehydrated.



- The temperature should be kept below 140°C otherwise further dehydration will take place resulting in anhydrous CaSO₄ which is dead burnt plaster because it loses the property of setting with water.

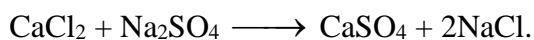
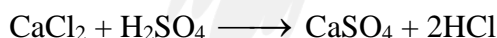


The first step is called the setting stage and the second, the hardening stage. The setting of plaster is catalysed by sodium chloride, while it is reduced by borax, or alum.

Calcium Sulphate, (CaSO₄ · 2H₂O) – Gypsum

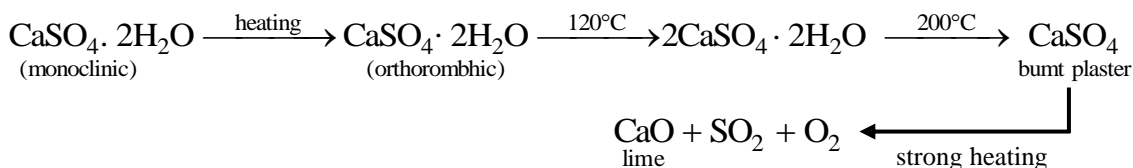
Preparation

- It can be prepared by reacting any calcium salt with either sulphuric acid or a soluble sulphate.

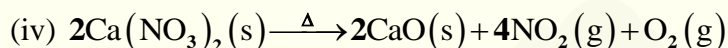
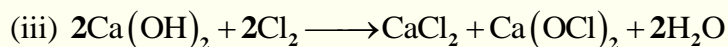
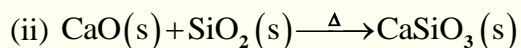
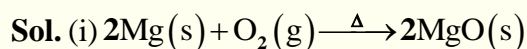


Properties

- It is white crystalline solid. It is sparingly soluble in water.
- It dissolves in dilute acids.
- When strongly heated with carbon, it forms calcium sulphide.
- Gypsum when heated at different temperature gives burnt plaster and finally lime (CaO).



Q. What happens when (i) magnesium is burnt in air, (ii) Quick lime is heated with silica (iii) chlorine reacts with slaked lime (iv) calcium nitrate is heated? [NCERT Exercise]



Cement

- Composition of cement:

The average composition of Portland cement is

Compound	Percentage
CaO	50 – 60%
SiO ₂	20 – 25%
Al ₂ O ₃	5 – 10%
MgO	1 – 3%
Fe ₂ O ₃	1 – 2%
SO ₃	1 – 2%
Na ₂ O	1%
K ₂ O	1%

Biological Importance or Significance of Magnesium

- Magnesium is essential for the activity of the various enzymes such as enzymes of glycolysis.
- It is the central atom present in chlorophyll (plant pigment necessary for photosynthesis).
- It is a cofactor for the breakdown of the fats and glucose.
- It is essential for the synthesis of the energy currency of the cell, that is, ATP.
- Responsible for the stability and synthesis of DNA.
- Maintains the electrolyte balance in the body.

Biological Importance of Calcium

- Maintains the anionic balance in the plant vacuole.
- Used to stabilize the permeability of cell membranes.
- Important for structure and function of proteins.
- Essential component during blood clotting.

Notes End

Important NCERT Questions

Q1. Potassium carbonate cannot be prepared by Solvay process. Why? [NCERT Exercise]

Sol. Potassium carbonate being more soluble than sodium bicarbonate does not get precipitated when CO_2 is passed through a concentrated solution of KCl saturated with ammonia.

Q2: Alkali metals react with water vigorously to form hydroxides and dihydrogen. Which of the following alkali metals reacts with water least vigorously? [NCERT Exemplar]

- (a) Li (b) Na
(c) K (d) Cs

Sol: (a) Both melting point and heat of reaction of alkali metals with water decrease down the group from Li to Cs. Although the heat of reaction of Li is the highest, but due to its high melting point, even this heat is not sufficient to melt the metal, which exposes greater surface to water for reaction. As a result, Li has the least reactivity but the reactivity increases as the melting point of alkali metals decreases down the group from Li to Cs.

Q3: The reducing power of a metal depends on various factors. Suggest the factor which makes Li, the strongest reducing agent in aqueous solution. [NCERT Exemplar]

- (a) Sublimation enthalpy (b) Ionisation enthalpy
(c) Hydration enthalpy (d) Electron-gain enthalpy

Sol: (c) Lithium has highest hydration enthalpy which accounts for its high negative E° value and its high reducing power.

And we can write the lithium oxide formula on the basis of this, which is a balanced oxidation state.

Q4. Why is Li_2CO_3 decomposed at a lower temperature whereas Na_2CO_3 at higher temperature? [NCERT Exemplar]

Sol. Li_2CO_3 is a covalent compound whereas Na_2CO_3 is an ionic compound. Therefore, lattice energy of Na_2CO_3 is higher than that of Li_2CO_3 . Thus, Li_2CO_3 is decomposed at a lower temperature. $\text{Li}_2\text{CO}_3 \rightarrow \text{Li}_2\text{O} + \text{CO}_2$

Q5: Metal carbonates decompose on heating to give metal oxide and carbon dioxide. Which of the metal carbonates is most stable thermally? [NCERT Exemplar]

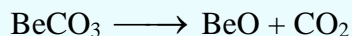
- (a) MgCO_3 (b) CaCO_3
(c) SrCO_3 (d) BaCO_3

Sol: (d) Thermal stability of metal carbonates increases as the electropositive character of the metal increases. Thus, BaCO_3 is the most stable.

Q6: Which of the carbonates given below is unstable in air and is kept in CO_2 atmosphere to avoid decomposition. [NCERT Exemplar]

- (a) BeCO_3 (b) MgCO_3
(c) CaCO_3 (d) BaCO_3

Sol: (a) Due to least electropositive character or least basicity of Be, BeCO_3 is less stable and hence decomposes to give BeO and CO_2 .



Since the decomposition reaction is reversible, therefore, to increase the stability of BeCO_3 or to reverse the above equilibrium, BeCO_3 is kept in an atmosphere of CO_2 .

Q7: The order of decreasing ionisation enthalpy in alkali metals is [NCERT Exemplar]

- (a) $\text{Na} > \text{Li} > \text{K} > \text{Rb}$ (b) $\text{Rb} < \text{Na} < \text{K} < \text{Li}$
(c) $\text{Li} > \text{Na} > \text{K} > \text{Rb}$ (d) $\text{K} > \text{Li} > \text{Na} > \text{Rb}$

Sol: (c) Ionization enthalpy decreases with increase in Size of the atom in a group. Hence, the order is: $\text{Li} > \text{Na} > \text{K} > \text{Rb}$.

Q8: The solubility of metal halides depends on their nature, lattice enthalpy and hydration enthalpy of the individual ions. Amongst fluorides of alkali metals, the lowest solubility of LiF in water is due to [NCERT Exemplar]

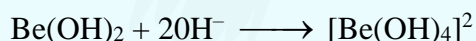
- (a) Ionic nature of lithium fluoride
(b) High lattice enthalpy
(c) High hydration enthalpy for lithium ion.
(d) Low ionisation enthalpy of lithium atom

Sol: (b) Due to small size of Li^+ and F^- ions, lattice enthalpy is much higher than hydration enthalpy and hence LiF is least soluble among alkali metal fluorides.

Q9: Amphoteric hydroxides react with both alkalies and acids. Which of the following Group 2 metal hydroxides is soluble in sodium hydroxide? [NCERT Exemplar]

- (a) $\text{Be}(\text{OH})_2$ (b) $\text{Mg}(\text{OH})_2$
(c) $\text{Ca}(\text{OH})_2$ (d) $\text{Ba}(\text{OH})_2$

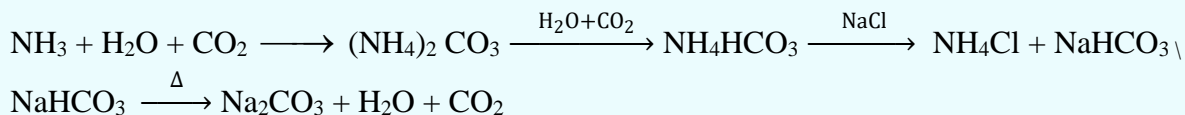
Sol: (a) $\text{Be}(\text{OH})_2$ reacts with NaOH to give beryllate ion, becoming soluble in it.



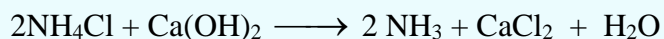
Q10: In the synthesis of sodium carbonate, the recovery of ammonia is done by treating NH_4Cl with $\text{Ca}(\text{OH})_2$. The by-product obtained in this process is [NCERT Exemplar]

- (a) CaCl_2 (b) NaCl
(c) NaOH (d) NaHCO_3

Sol: (a) Sodium carbonate is synthesised by Solvay or ammonia soda process. The reactions involved are



In this process NH_3 is recovered when the solution containing NH_4Cl is treated with $\text{Ca}(\text{OH})_2$. Calcium chloride is obtained as a by-product.



Q11: When sodium is dissolved in liquid ammonia, a solution of deep blue colour is obtained.

The colour of the solution is due to

[NCERT Exemplar]

- (a) ammoniated electron
- (b) sodium ion
- (c) sodium amide
- (d) ammoniated sodium ion

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

The colour of solution (deep blue) is due to the ammoniated electron which absorbs energy in the visible region.

Q12: By adding gypsum to cement

[NCERT Exemplar]

- (a) setting time of cement becomes less.
- (b) setting time of cement increases.
- (c) colour of cement becomes light.
- (d) shining surface is obtained.

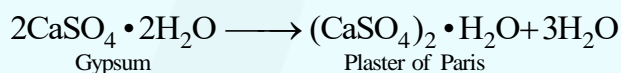
Sol: (b) Raw materials for cement are limestone, clay and gypsum. Cement is a dirty greyish heavy powder containing calcium aluminates and silicates. Gypsum ($CaSO_4 \cdot 2H_2O$) is added to the components to increase the setting time of cement so that it gets sufficiently hardened. Setting of cement is an exothermic process and involves hydration of calcium aluminates and, silicates.

Q13: Dead burnt plaster is

[NCERT Exemplar]

- (a) $CaSO_4$
- (b) $CaSO_4 \cdot \frac{1}{2} H_2O$
- (c) $CaSO_4 \cdot H_2O$
- (d) $CaSO_4 \cdot 2H_2O$

Sol: (a) Plaster of Paris is prepared by heating gypsum at $120^\circ C$.



On heating plaster of Paris at $200^\circ C$, it forms anhydrous calcium sulphate, i.e., dead plaster which has no setting property as it absorbs water very slowly.



Q14: Suspension of slaked lime in water is known as

[NCERT Exemplar]

- (a) lime water
- (b) quick lime
- (c) milk of lime
- (d) aqueous solution of slaked lime

Sol: (c) Suspension of slaked lime in water is known as milk of lime.

Q15: Which of the following elements does not form hydride by direct heating with dihydrogen?

[NCERT Exemplar]

- (a) Be
- (b) Mg
- (c) Sr
- (d) Ba

Sol: (a) Due to high ionization enthalpy and small size, Be does not react with hydrogen by direct heating.

Q16: The formula soda ash is

[NCERT Exemplar]

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

(b) $\text{Na}_2\text{CO}_3 \cdot 2\text{H}_2\text{O}$

(c) $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$

(d) Na_2CO_3

Sol: The answer is the option (iv) Soda ash is formed when Washing soda ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$) loses water of crystallization above 373K.

“Focus on your goals, Not on your obstacles”

Ab Phod Do!

