



## II. Short Answer Type Questions

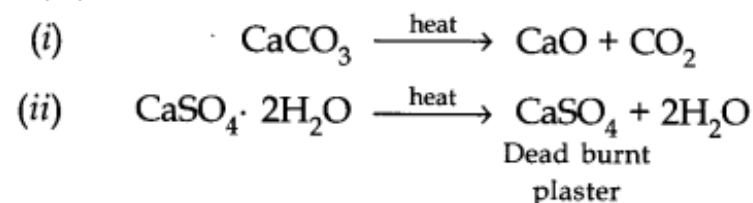
Question 1. Why are alkali metals always univalent? Which alkali metal ion forms largest hydrated ion in aqueous solution?

Answer: They are always univalent because after losing one electron, they acquire nearest inert gas configuration.  $\text{Li}^+$  forms largest hydrated cations because it has the highest hydration energy.

Question 2. What is the effect of heat on the following compounds (Give equations for the reactions)?

(i)  $\text{CaCO}_3$  (ii)  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

Answer:



Question 3. Explain the following:

(a) Lithium iodide is more covalent than lithium fluoride.

(b) Lattice enthalpy of  $\text{LiF}$  is maximum among all the alkali metal halides.

Answer: (a) According to Fajan's rule,  $\text{Li}^+$  ion can polarise  $\text{I}^-$  ion more than the  $\text{F}^-$  ion due to bigger size of the anion. Thus  $\text{LiI}$  has more covalent character than  $\text{LiF}$ .

(b) Smaller the size (internuclear distance), more is the value of Lattice enthalpy since internuclear distance is expected to be least in the  $\text{LiF}$ .

Question 4. Write the chemical formula of the following compounds.

(i) Chile salt petre

(ii) Marble

(iii) Brine

Answer:

(i)  $\text{NaNO}_3$

(ii)  $\text{CaCO}_3$

(iii)  $\text{NaCl}$ .

Question 5. Explain the following:

(a) Why  $\text{Cs}$  is considered as the most electropositive element?

(b) Lithium cannot be used in making photoelectric cells.

(c) Lithium does not form alums.

Answer:

(a) Due to its lowest ionization energy,  $\text{Cs}$  is considered as the most electropositive element.

(b) Lithium cannot be used in making photoelectric cells because out of all the alkali metals it has highest ionization energy and thus cannot emit electrons when exposed to light.

(c) Due to small size, lithium does not form alums.

Question 6. (a) What makes lithium to show properties uncommon to the rest of the alkali metals?

(b) When is a cation highly polarising? Which alkali metal cation

has the highest polarising power?

Answer:

(a) The unusual properties of lithium as compared to other alkali metals is due to its exceptionally small size of atom and its ion and its high polarising power.

(b) A cation is highly polarising if its charge/ size ratio is very high.

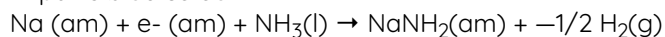
$\text{Li}^+$  ion has the highest polarising power.

Question 7. Why are ionic hydrides of only alkali metals and alkaline earth metals are known? Give two examples.

Answer: Alkali metals and alkaline earth metals are most electropositive due to low ionization enthalpy therefore they form ionic hydrides, e.g.  $\text{NaH}$ ,  $\text{KH}$  and  $\text{CaH}_2$

Question 8. Why does the solution of alkali metals becomes blue in liquid ammonia? Give the chemical equation also.

Answer: The blue colour of the solution is due to ammoniated electron which absorbs energy in the visible region of light and imparts blue colour.



Question 9. Give the important uses of the following compounds.

(i)  $\text{NaHCO}_3$  (ii)  $\text{NaOH}$

Answer:

(i) Uses of  $\text{NaHCO}_3$

- It is used in fire extinguisher.
- It is mild antiseptic for skin infections.
- It is used as antacid.

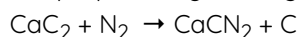
(ii) Uses of  $\text{NaOH}$

- It is used in soap industry.
- It is used in textile industry.
- It is used as reagent in laboratory.
- It is used in absorbing poisonous gases.

Question 10. What is the mixture of  $\text{CaC}_2$  and  $\text{N}_2$  called? How is it prepared?

Answer: It is called Nitrolime.

It is prepared by heating  $\text{CaC}_2$  with  $\text{N}_2$  at high temperature.



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