NCERT EXERCISES

10.1 What are the common physical and chemical features of alkali metals ?

10.2 Discuss the general characteristics and gradation in properties of alkaline earth metals.

10.3 Why are alkali metals not found in nature ?

10.4 Find out the oxidation state of sodium in Na_2O_2.

10.5 Explain why is sodium less reactive than potassium.

10.6 Compare the alkali metals and alkaline earth metals with respect to (i) ionisation enthalpy (ii) basicity of oxides and (iii) solubility of hydroxides.

10.7* In what ways lithium shows similarities to magnesium in its chemical behaviour?

10.8 Explain why can alkali and alkaline earth metals not be obtained by chemical reduction methods?

10.9* Why are potassium and caesium, rather than lithium used in photoelectric cells?

10.10 When an alkali metal dissolves in liquid ammonia the solution can acquire different colours. Explain the reasons for this type of colour change.

10.11* Beryllium and magnesium do not give colour to flame whereas other alkaline earth metals do so. Why ?

10.12** Discuss the various reactions that occur in the Solvay process.

10.13** Potassium carbonate cannot be prepared by Solvay process. Why ?

10.14* Why is Li_2CO_3 decomposed at a lower temperature whereas Na_2CO_3 at higher temperature?

10.15 Compare the solubility and thermal stability of the following compounds of the alkali metals with those of the alkaline earth metals. (a) Nitrates (b) Carbonates (c) Sulphates.

10.16 Starting with sodium chloride how would you proceed to prepare (i) sodium metal (ii) sodium hydroxide (iii) sodium peroxide (iv) sodium carbonate ?

10.17* 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 ?

10.18 Describe two important uses of each of the following : (i) caustic soda (ii) sodium carbonate (iii) quicklime.

10.19** Draw the structure of (i) $BeCl_2$ (vapour) (ii) $BeCl_2$ (solid).

10.20* The hydroxides and carbonates of sodium and potassium are easily soluble in water while the corresponding salts of magnesium and calcium are sparingly soluble in water. Explain.

10.21* Describe the importance of the following : (i) limestone (ii) cement (iii) plaster of paris.

10.22* Why are lithium salts commonly hydrated and those of the other alkali ions usually anhydrous?

10.23* Why is LiF almost insoluble in water whereas LiCl soluble not only in water but also in acetone ?

10.24 Explain the significance of sodium, potassium, magnesium and calcium in biological fluids.

10.25 What happens when

(i) sodium metal is dropped in water ?

(ii) sodium metal is heated in free supply of air ?

(iii) sodium peroxide dissolves in water ?

10.26 Comment on each of the following observations:

(a) The mobilities of the alkali metal ions in aqueous solution are $Li^+ < Na^+ < K^+ < Rb^+ < Cs^+$

(b) Lithium is the only alkali metal to form a nitride directly.

(c) $E^{\ominus}$ for $M^{2+}(aq) + 2e^- \rightarrow M(s)$ (where M = Ca, Sr or Ba) is nearly constant.

10.27 State as to why

(a) a solution of Na_2CO_3 is alkaline ?

(b) alkali metals are prepared by electrolysis of their fused chlorides ?

(c) sodium is found to be more useful than potassium ?

10.28 Write balanced equations for reactions between

(a) Na_2O_2 and water

(b) KO_2 and water

(c) Na_2O and CO_2.

10.29 How would you explain the following observations?

(i) BeO is almost insoluble but $BeSO_4$ in soluble in water

(ii) BaO is soluble but $BaSO_4$ is insoluble in water.

(iii) LiI is more soluble than KI in ethanol.

10.30 Which of the alkali metal is having least melting poir ?

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

10.31 Which one of the following alkali metals gives hydr ed salts ?

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

10.32 Which one of the alkaline earth metal carbonates thermally the most stable ?

(a) $MgCO_3$ (b) $CaCO_3$ (c) $SrCO_3$ (d) BaC_3