

# SRIGAYATRI EDUCATIONAL INSTITUTIONS

## INDIA

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### IA Group elements

- Which one of the following statement is true for all the alkalimetals?**
  - 1) Their nitrates decomposes on heating to give  $\text{NO}_2$  and  $\text{O}_2$ .
  - 2) Their carbonates decomposes on heating to give  $\text{CO}_2$  and normal oxide
  - 3) They react with halogens to give the halides of the type  $\text{MX}$
  - 4) They react with oxygens to give mainly the oxide,  $\text{M}_2\text{O}$
- In the case of alkali metals, the covalent character decreases in the order**
  - 1)  $\text{MCl} < \text{MI} > \text{MBr} > \text{MF}$
  - 2)  $\text{MF} > \text{MCl} > \text{MBr} > \text{MI}$
  - 3)  $\text{MF} > \text{MCl} > \text{MI} > \text{MBr}$
  - 4)  $\text{MI} > \text{MBr} > \text{MCl} > \text{MF}$
- Sodium metal can be stored under:**
  - 1) Benzene
  - 2) Kerosene
  - 3) Alcohol
  - 4) Water
- An element having electronic configuration  $1s^2, 2s^2 2p^6, 3s^2 3p^6, 4s^1$  will form**
  - 1) Acidic oxide
  - 2) basic oxide
  - 3) Amphoteric oxide
  - 4) neutral oxide
- The solubility of  $\text{MClO}_4$  [ $\text{M} = \text{Li, Ne, K, Rb}$ ] increases in order of**
  - 1)  $\text{LiClO}_4 < \text{NaClO}_4 < \text{KClO}_4 < \text{RbClO}_4$
  - 2)  $\text{NaClO}_4 < \text{RbClO}_4 < \text{LiClO}_4 < \text{KClO}_4$
  - 3)  $\text{RbClO}_4 < \text{KClO}_4 < \text{NaClO}_4 < \text{LiClO}_4$
  - 4)  $\text{KClO}_4 < \text{LiClO}_4 < \text{NaClO}_4 < \text{RbClO}_4$
- The correct order of the mobility of the alkali metal ions in aqueous solution is**
  - 1)  $\text{Rb}^+ > \text{K}^+ > \text{Na}^+ > \text{Li}^+$
  - 2)  $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Rb}^+$
  - 3)  $\text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Li}^+$
  - 4)  $\text{K}^+ > \text{Rb}^+ > \text{Na}^+ > \text{Li}^+$
- The electrolyte used in castner's process of sodium extraction is**
  - 1) anhydrous  $\text{Na}_2\text{CO}_3$
  - 2) aqueous  $\text{NaOH}$
  - 3)  $\text{NaCl} + \text{CaCl}_2$
  - 4) Fused anhydrous  $\text{NaOH}$
- Which of the following salts does not form any precipitate with excess of  $\text{NaOH}$** 
  - 1)  $\text{ZnCl}_2$
  - 2)  $\text{FeCl}_3$
  - 3)  $\text{CrCl}_3$
  - 4)  $\text{CuSO}_4$
- Thermal stability of hydrides of first group elements follows the order :**
  - 1)  $\text{LiH} > \text{NaH} > \text{KH} > \text{RbH}$
  - 2)  $\text{LiH} > \text{KH} > \text{NaH} > \text{RbH}$
  - 3)  $\text{LiH} > \text{RbH} > \text{KH} > \text{NaH}$
  - 4)  $\text{LiH} > \text{KH} > \text{RbH} > \text{NaH}$

- 10. For the preparation of sodium thiosulphate by “spring’s reaction”, the reactants used are**
- 1)  $Na_2S + Na_2SO_3 + Cl_2$     2)  $Na_2S + SO_2$     3)  $Na_2S + Na_2SO_3 + I_2$     4)  $Na_2SO_3 + S$
- 11. In view of their low ionisation energies, the alkali metals are:**
- 1) Weak oxidising agents    2) Strong reducing agents  
3) Strong oxidising agents    4) weak reducing agents
- 12. Chile saltpetre is**
- 1)  $NaNO_3$     2)  $Na_2SO_4$     3)  $KNO_3$     4)  $Na_2SO_3$
- 13. Based on lattice energy and other considerations which one of following alkali metals chloride is expected to have melting point :**
- 1)  $LiCl$     2)  $NaCl$     3)  $KCl$     4)  $RbCl$
- 14. A colourless solid (X) on heating evolved  $CO_2$  and also gave a white residue, soluble in water. Residue also gave  $CO_2$  when treated with dilute acid (X) is**
- 1)  $Na_2CO_3$     2)  $CaCO_3$     3)  $NaHCO_3$     4)  $Ca(HCO_3)_2$
- 15. Statement I :  $Li_2CO_3$  decomposes on heating to give  $CO_2$  gas**
- Statement II : carbonates of alkali metals give weakly alkaline solution due to the hydrolysis of carbon ion**
- 1) Both the statements are true    2) Both the statements are false  
3) I is false and II is true    4) I is true and II is false
- 16. Soda ash is**
- 1)  $Na_2CO_3$     2)  $Na_2CO_3 \cdot 10H_2O$     3)  $Na_2CO_3 \cdot H_2O$     4)  $NaHCO_3$
- 17.  $Na_2CO_3$  and  $NaHCO_3$  can be distinguished by treating with**
- 1) litmus solution    2) dil.  $H_2SO_4$     3)  $MgCO_3$     4) Phenolphthalein
- 18. To the extraction of sodium by down’s process, cathode and anode are respectively**
- 1) Copper and Nickel    2) Copper and chromium  
3) Nickel and chromium    4) Iron and Graphite
- 19. The correct order of stability for the following superoxide is**
- 1)  $KO_2 > CsO_2 > RbO_2$     2)  $RbO_2 > CsO_2 > KO_2$   
3)  $KO_2 > RbO_2 > CsO_2$     4)  $CsO_2 > RbO_2 > KO_2$
- 20. In Solvay’s process  $NaHCO_3$  separates out due to**
- 1) High lattice energy    2) High solubility

3) Common ion affect

4) less solubility of  $\text{Na}_2\text{CO}_3$

**21. Backing soda is**

1) Sodium bisulphate

2) sodium carbonate

3) Sodium bicarbonate

4) potassium carbonate

**22. The molecular formula is cryolite is**

1)  $3.\text{NaF}.\text{AlF}_3$

2)  $\text{AlF}_3$

3)  $2\text{NaAlF}_3$

4)  $\text{NaFAIF}_3$

**23. A solution of sodium metal in liquid ammonia is strongly reducing due to presence of**

1) Sodium hydride

2) solvated electrons

3) Sodium amide

4) Sodium atoms

**24. A: Alkali metals are very soft and they can be cut with knife**

**R: Alkali metals have weak interatomic forces of attraction**

1) Both (A) and (R) are true and (R) is the correct explanation of (A)

2) Both (A) and (R) are true and (R) is not the correct explanation of (A)

3) Both (A) and (R) are true

4) Both (A) and (R) are false

**25. A: Sodium is most abundant alkali metal**

**R: sodium is a typical alkalimetal**

1) Both (A) and (R) are true and (R) is the correct explanation of (A)

2) Both (A) and (R) are true and (R) is not the correct explanation of (A)

3) Both (A) and (R) are true

4) Both (A) and (R) are false

**26. A: Alkali metal super oxides are paramagnetic**

**R: Superoxide ions is isoelectronic with  $\text{F}_2$  molecule**

1) Both (A) and (R) are true and (R) is the correct explanation of (A)

2) Both (A) and (R) are true and (R) is not the correct explanation of (A)

3) Both (A) and (R) are true

4) (A) is true (R) is false

**Integer type questions:**

**27. Reaction of  $\text{Br}_2$  with  $\text{Na}_2\text{CO}_3$  in aqueous solution gives sodium bromide and sodium bromate with evolution of  $\text{CO}_2$  gas. The sum of stoichiometric coefficients product side is**

## KEY

1. 3	2. 4	3. 2	4. 2	5. 3	6. 1	7. 4	8. 1	9. 1	10. 3
11. 2	12. 1	13. 2	14. 3	15. 1	16. 1	17. 4	18. 4	19. 4	20. 3
21. 3	22. 1	23. 2	24. 1	25. 2	26. 4	27. 9			

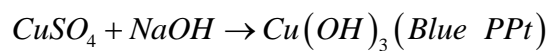
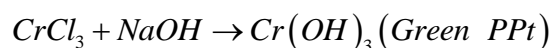
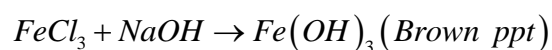
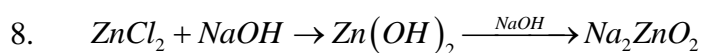
## Solutions

2. According to Fajan's rule

$$\text{covalent character} \propto \frac{1}{\text{size of cation}} \propto \text{size of anion}$$

5. Atomic size increases solubility decreases

6. Smaller the cation higher will be hydration



11. Low I.E. of alkali metals act as strong reducing agents

13. On the bases of lattice energy, the m.p decreases in the alkali group as lattice energy decreases with the increase of the atomic number. However, LiCl has covalent character due to very small size of  $Li^+$  ion. Hence m.p of NaCl is highest amongst the above chlorides.

