

7. ALKALIMETALS (IA)

PREVIOUS EAMCET BITS

1. The correct order of stability for the following superoxides is (2008 M)

- 1) $\text{KO}_2 > \text{RbO}_2 > \text{CsO}_2$ 2) $\text{RbO}_2 > \text{CsO}_2 > \text{KO}_2$
3) $\text{CsO}_2 > \text{RbO}_2 > \text{KO}_2$ 4) $\text{KO}_2 > \text{CsO}_2 > \text{RbO}_2$

Sol: Ans: 3. Larger the size of alkali metal atom more the stability of superoxide

2. The chemical formula of feldspar (2007 E)

- 1) KAlSi_3O_8 2) Na_3AlF_6 3) NaAlO_2 4) $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 4\text{Al}(\text{OH})_3$

Ans: 1.

Sol: Feldspar is $\text{K} \cdot \text{AlSi}_3\text{O}_8$ (or) $\text{K}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{SiO}_2$

3. Which of the following pairs liberate gas a when they react with each other (2005 M)

- 1) SiO_2, Na 2) Fused NaOH, C 3) $\text{Mg}, \text{B}_2\text{O}_3$ 4) Mg, CO_2

Ans: 2.

Sol: $6\text{NaOH} + 2\text{C} \longrightarrow 2\text{Na}_2\text{CO}_3 + 3\text{H}_2$

4. A mixture of sodium oxide and calcium oxide are dissolved in water and saturated with excess carbon dioxide gas. The resulting solution is It contains (2003 E)

1. Basic NaOH and $\text{Ca}(\text{OH})_2$ 2. Neutral Na_2CO_3 and CaCO_3
3. Basic Na_2CO_3 and CaCO_3 4. Acidic NaOH and CaCO_3

Ans: 3

Sol. Oxides of sodium and calcium when dissolved in water and saturated with excess of CO_2 gives carbonates ($\text{Na}_2\text{CO}_3, \text{CaCO}_3$) which are basic in nature. santhoshi

5. In the Castner process for the extraction of sodium, the anode is made of metal (2003 E)

1. Copper 2. Iron 3. Sodium 4. Nickel

Ans: 4

Sol. In castners process for the extraction of sodium the anode is made up of nickel and cathode is made up of iron

6. Which of the following is used for reviving the exhausted 'permutit' ? (2003 M)

1. HCl solution 2. 10% CaCl_2 solution
3. 10% MgCl_2 solution 4. 10% NaCl solution

Ans: 4

Sol. 10% NaCl (Brine solution is used for the regeneration of Permutit.

7. What is the reaction occurring at the anode in Down's process for the extraction of sodium? (2002E)

1. $4\text{OH}^- \longrightarrow 2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^-$ 2. $\text{Na}^+ + 1\text{e}^- \longrightarrow \text{Na}$
3. $2\text{Cl}^- \longrightarrow \text{Cl}_2 + 2\text{e}^-$ 4. $\text{NaOH} \longrightarrow \text{Na}^+ + \text{OH}^-$

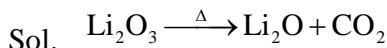
Ans: 3

Sol. Anode reaction is $2\text{Cl}^- \longrightarrow \text{Cl}_2 + 2\text{e}^-$

8. What are the products formed when Li_2CO_3 undergoes decomposition? (2002 M)

1. $\text{Li}_2\text{O}, \text{CO}$ 2. $\text{Li}_2\text{O}, \text{CO}$ 3. $\text{Li}_2\text{O}, \text{CO}_2$ 4. $\text{Li}_2\text{O}, \text{CO}$

Ans: 3



9. In organic reactions, sodium in liquid ammonia is used as (2001 E)

1. Reducing agent 2. Hydrolyzing agent 3. Oxidizing agent 4. Precipitating agent

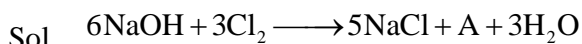
Ans: 1

Sol. In organic reaction sodium in liquid ammonia is used as reducing agent.

10. Consider the following reaction $6\text{NaOH} + 3\text{Cl}_2 \rightarrow 5\text{NaCl} + \text{A} + 3\text{H}_2\text{O}$. What is the oxidation number of chlorine in "A"? (2001 M)

1. +5 2. -1 3. +3 4. +1

Ans: 1



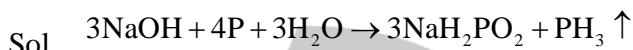
A is NaClO_3 oxidation state of Cl is +5

$$x + 1 - 6 = 0 \quad x = +5$$

11. Aqueous sodium hydroxide reacts with white phosphorous to form phosphine and (2001 M)

1. NaH_2PO_2 2. P_2O_5 3. Na_2PO_3 4. P_2O_3

Ans: 1



12. In the Castner's process of extraction of sodium, cathode is (2000 E)

1. Iron rod 2. Nickel rod 3. Copper rod 4. Graphite rod

Ans: 1

Sol. In Castner's process cathode is iron rod and anode is nickel rod.

13. Which of the following set of raw materials are used in the manufacture of Na_2CO_3 by Solvay process? (1999 E)

1. $\text{Ca(OH)}_2, \text{NH}_3, \text{CO}_2$ 2. $\text{CaCl}_2, \text{NH}_3, \text{CO}_2$ 3. $\text{NaOH}, \text{NH}_3, \text{CO}_2$ 4. $\text{NaCl}, \text{NH}_3, \text{CO}_2$

Ans: 4

Sol. In Solvay process raw materials are $\text{NaCl}, \text{NH}_3, \text{CO}_2$

14. Metals having ns^1 as the valence electronic configuration (1999 M)

1. act as strong oxidizing reagent 2. are highly electronegative
3. are highly electropositive 4. have a first ionization potential of more than 10 eV/atom

Ans: 3

Sol. Alkali metals have ns^1 valence electronic configuration therefore they are highly electropositive and strong reducing agents.

15. Which of the following does not participate in the Solvay's process for the manufacture of Na_2CO_3 ? (1998 E)

1. NH_3 2. NaCl solution 3. CO_2 4. H_2SO_4

Ans: 4

Sol. In Solvay process raw material are $\text{NaCl}, \text{NH}_3, \text{CO}_2$ and H_2SO_4 is not used in this process.

16. Which one of the following compounds liberates CO_2 from aqueous NaHCO_3 (1997 E)

1. Anilinium Chloride 2. CHCl_3 3. CCl_4 4. CH_3Cl

Ans: 1

Sol. Anilinium chloride reacts with NaHCO_3 gives CO_2 gas.

17. Sodium amalgam is used as (1996 E)

1. Oxidising agent 2. Catalyst 3. Reducing agent 4. Bleaching agent

Ans: 3

Sol. Sodium amalgam is used as reducing agent

18. The oxidation state of sodium in sodium amalgam is (1996 E)
 1. +1 2. -1 3. Zero 4. +2
 Ans: 3
- Sol. Oxidation state of sodium in sodium amalgam is zero .
19. Baking Soda is (1996 M)
 1. Sodium bicarbonate 2. Potassium bicarbonate
 3. Ammonium carbonate 4. Sodium carbonate
 Ans: 1
- Sol. Sodium bicarbonate (NaHCO_3) is called backing soda.
20. Which of the following alkali metals has the highest tendency for the half reaction? (1995 E)
 $\text{M(g)} \rightarrow \text{M}^+(\text{g}) + \text{e}^-$
 1. sodium 2. Lithium 3. Potassium 4. Caesium
 Ans: 4
- Sol. Caesium has lowest ionization potential
21. A solution of sodium in liquid ammonia is blue due to the presence of (1995 M)
 1. Na atoms 2. Ammonium ions 3. Solvated Na^+ ions 4. Solvated electrons
 Ans: 4
- Sol. A solution of sodium in liquid ammonia is blue in colour due to the presence of solvated electron.
22. Which of the following oxide is paramagnetic? (1995 M)
 1. Na_2O 2. Na_2O_2 3. K_2O 4. KO_2
 Ans: 4
- Sol. KO_2 is a superoxide. Super oxides are paramagnetic in nature due to the presence of unpaired electrons.
23. The number of hydroxide ions produced by one molecule of Na_2CO_3 on hydrolysis (1995 M)
 1. 4 2. 2 3. 3 4. 0
 Ans: 2
- Sol. $\text{Na}_2\text{CO}_3 + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2\text{CO}_3$
 $2\text{NaOH} \rightarrow 2\text{Na}^+ + 2\text{OH}^-$ (or) $\text{CO}_3^{2-} + 2\text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3 + 2\text{OH}^-$
24. The castner - kellner cell used for the manufacture of NaOH, the cathode in the central compartment is made of (1994 M)
 1. iron 2. Carbon 3. Mercury 4. Steel
 Ans: 1
- Sol. In Castner – Kellner is process cathode is a iron rod. (bunch of iron rods)
25. Zn^{2+} dissolves in excess of NaOH due to the formation of (1992 M)
 1. Zn(OH)_2 2. ZnO 3. Na_2ZnO_2 4. all the above
 Ans: 3
- Sol. Zn^{2+} dissolved in excess of NaOH due to the formation of Na_2ZnO_2 (sodium Zincate).
26. Among the alkali metals, the metal with the highest ionisation potential is (1991 E)
 1. Na 2. Li 3. Rb 4. Cs
 Ans: 2
- Sol. In groups (IA) top to bottom ionization potential decreases.
27. Alkali metals are (1985 E)
 1. Oxidising agents 2. dehydrating agents 3. reducing agents 4. All the above
 Ans: 3
- Sol. Alkali metals are reducing agents.

