10.2 ALKALI METALS

Periodic discussion and general characteristics

1. Which of the following has the lowest melting point? (IOM)
   a. Li b. Na c. K d. Cs
2. Which of the following is the valence shell electronic configuration of alkali metals?
   a. ns^2 b. ns^{1-2} c. $ns^2 np^1$ d.ns^1
3. Alkali metals lose electrons from
   a. s- orbitals b. p-orbitals c. d-orbitals d. f-orbitals
4. Alkali metals are
   a. Oxidising agents c. Reducing agents
   b. Oxidants d. all
5. The lightest metal is
   a. Lithium b. Sodium c. Magnesium d. Aluminium
6. Cs is the most active metal among the alkali metals (Li, Na, K, Rb, Cs) because
   a. it has the highest boiling point
   b. it has the highest number of valence electrons
   c. it has valence electrons close to the nucleus
   a. it has the valence electrons farthest away from the nucleus
7. Pick out the false statement for alkali metals.
   a. Alkali metals can be easily cut with a knife.
   b. Alkali metals show +1 oxidation state.
   c. Alkali metals are stored under water.
   d. The ionisation potentials of alkali metals decrease down the group.
8. Which of the following properties is shown by alkali metals?
   a. Electropositive b. Electronegative c. Neutral d. Non-metallic
9. Which of the following metals imparts a golden yellow colour in a Bunsen flame?
   a. Natrium b. Kalium c. Potassium d. Caesium
10. Sodium gives which colour to the Bunsen flame?
    a. crimson red c. violet b. green d. golden yellow
11. Alkali metals impart colour to the Bunsen flame due to
    a. Lighter density b. reducing nature c. low IE d. softness
12. The electronic configuration of an element is 2,8,1. Which of the following statements is true?
    a. It is diatomic.
    b. It is a non-metal.
    c. It is a transition metal.
    d. It forms a basic oxide.
13. Metallic lustre of sodium metal can be explained based on
    a. Diffusion of sodium ions
    b. Oscillation of loose electrons
    c. Existence of free protons
    d. The existence of body-centred lattice

Sodium

14. The formula of nitre is
    a. KNO_3 b. $NaNO_3$ c. NaCl d. HNO_3

Extraction from Down's process

15. Down's process is used for the extraction of
    (a) ammonia
    (b) nitric acid

(c) sodium

(d) sulphuric acid

16. Sodium is commercially obtained by the electrolysis of its fused chloride. The process is called:
    a. Castner Process c. Down's process b. Kellener Process d. Solvay proces
17. In Down's precess NaCl is fused with $CaCl_2$ to
    a. Decrease the ionisation of NaCl
    b. Increase the ionisation of NaCl
    c. Decrease the melting point of NaCl
    d. Increase the melting point of NaCl
18. Downs cell has
    a. carbon anode and iron cathode
    b. Iron cathode and graphite anode
    c. Graphite cathode and an iron anode
    d. Carbon cathode and graphite anode
19. In Downs' process, $CaCl_2$ is added
    a. To increase the conductivity of the electrolyte
    b. To increase the rate of deposition of sodium
    c. To stop the evolution of chlorine at the anode
    d. To reduce the melting point of fused NaCl to 600^0C
20. *In the down's cell, the ratio of NaCl:$CaCl_2$ is*
    a. 1:2 b. 2:3 c. 1:3 d. 3:4
21. Sodium is commercially obtained by the electrolysis of its fused chloride. The process is called
    a. Castner Process c. Haber's Process
    b. Down's process d. Solvay process
22. If a brine solution is used in Down's cell, which of the following deposits at the cathode?
    c. Ca *b) Na* *c) H_2* *d) O_2*

During the electrolysis of fused NaCl, which reaction occurs at the anode?

a. Chloride ions are oxidised
b. Chloride ions are reduced
c. Sodium ions are oxidised
d. Sodium ions are reduced

Chemical properties

23. On prolonged exposure to air, sodium changes into
    a. Na_2O b. NaOH c. Na_2CO_3 d. $NaHCO_3$
24. When sodium burns in excess air, the products formed is/are
    a. Na_2O b. Na_2O_2 c. NaO_2 d. Na_2O and Na_2O_2
25. *When sodium is treated with sufficient oxygen/air, the product formed is:*
    a) Na_2O *b) Na_2O_2* *c) NaO_2* *d) NaO*
26. A solution of sodium metal in liquid ammonia is strongly reduced due to the presence of
    a. Sodium atoms c. Sodium hydroxide b. Sodium amide d. Solvated electrons.
27. During the detection of organic compound sodium extract is prepared
    a. To dissolve it in water c. to convert it into ionic form
    b. to make it more reactive d. to make the reaction slow
28. Excess of Na^+ ions in our body causes
    a. low blood pressure c. anaemia
    b. diabetes d. high blood pressure

Sodium Hydroxide

29. Which of the following is a deliquescent solid?

a. NaOH c.$CaSO_4.2H_2O$

b. $MgSO_4.7H_2O$ d. $Na_2CO_3.10H_2O$

30. Sodium carbonate is

a. Efflorescent b. Deliquescent c. Hygroscopic d. oxidant

Sodium carbonate (Na_2CO_3)

31. The molecular formula of washing soda is

a. $Na_2CO_3.7H_2O$ c. $Na_2CO_3.10H_2O$

b. $Na_2CO_3.5H_2O$ d. Na_2CO_3

32. Sodium carbonate is

a. Efflorescent b. deliquescent c. hygroscopic d. oxidant

33. Which of the following substances dissolved in water will give a basic solution?

a. Na_2CO_3 b. $Al_2(SO_4)_3$ c. NH_4Cl d. KNO_3

34. Baking soda is

a. Na_2CO_3 b.$NaHCO_3$ c. K_2CO_3 d. NaOH

35. The fire extinguisher contains H_2SO_4 and

a. $NaHCO_3$ c. Sodium carbonate

b. Calcium carbonate d. $Na_2CO_3 + NaHCO_3$

36. Which of the following statements is not true?

a. Sodium carbonate is commonly known as washing soda.

b. Sodium hydroxide is a white deliquescent solid.

c. Alkali metals are found free in nature

d. Sodium vapour lamp penetrates through the fog and is not blinding to motorists.

37. The aqueous solution of Na_2CO_3 is

a. Acidic b. basic c. neutral d. amphoteric

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