

KVPY INTERVIEW)(CHEMISTRY)

1. Arrange the following compounds in increasing order of dipole moment, toluene (\square), o-dichlorobenzene ($\square\square$), m-dichlorobenzene ($\square\square\square$) and p-dichlorobenzene ($\square\square$).

Ans. $IV < I < III < II$

2. Arrange CN , CN^+ and CN^- in increasing order of relative stabilities.

Ans. $CN^- > CN > CN^+$

3. In which solvent $NaCl$ has maximum solubility ?

Ans. H_2O

4. Indicate whether glycine ($NH_2 - CH_2 - COOH$) is an acid or a base or both.

Ans. Both (Since in this $-NH_2$ is basic and $-COOH$ is acidic)

5. A reaction between $AlCl_3$ and NH_3 is called -

Sol. Neutralisation

6. Which metal is not found in meteorites ?

Sol. Ag, Au

7. What is use of Hall-Heroult cell ?

Ans. Purification of aluminium.

8. What is the difference between corundum and carborundum ?

Ans. Corundum is Al_2O_3 and carborundum is SiC .

9. In which climate tin cannot be used as structural metal ?

Ans. In cold climate because in cold climate tin becomes brittle.

10. Oxide of which metal is used in sun screen ?

Ans. ZnO

11. What is the chemical formula of fool's gold ?

Sol. FeS_2

12. When an impurity in metal has greater affinity for oxygen and is more easily oxidised than the metal itself, then which process is used to refine the metal ?

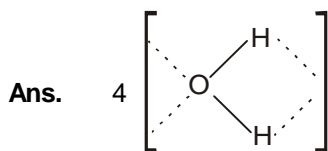
Sol. Cupellation



13. Which compounds act as propellant for rockets ?

Ans. Liquid hydrogen + Liquid oxygen

14. How many H-bonds are formed by a water molecule ?



15. What is the volume of O_2 liberated at NTP by complete decomposition of 100 ml of 2M solution of H_2O_2 ?

Ans. 2.24 L

$$\text{Volume strength} = 11.2 \times M$$

$$= 11.2 \times 2 = 22.4 \text{ L}$$

$$\therefore 1000 \text{ ml} = 22.4 \text{ L}$$

$$\therefore 100 \text{ ml} = \frac{22.4}{1000} \times \frac{100}{1}$$

$$= 2.24 \text{ L}$$

16. Zinc gives H_2 gas with conc. H_2SO_4 and conc. HCl but not with conc. HNO_3 . Why ?

Ans. NO_3^- ion is reduced to NO_2 in preference to H_3O^+ (hydronium) ion.

17. A compound of mercury which used in cosmetics, in Ayurvedic and Yunani medicines and known as Vermilion.

Ans. HgS

18. 'Bordeaux mixture' is used as fungicide. Write its composition.

Ans. $CuSO_4 + Ca(OH)_2$

19. Name the metals present in insulin, haemoglobin and vitamin B_{12} respectively.

Ans. Zn, Fe, Co

20. A substance X is a compound of an element of group 1A. The substance X gives violet colour in flame test, X is :

Ans. KCl

21. Why is $Na_2S_2O_3 \cdot 5H_2O$ used in photography ?

Ans. To remove decomposed $AgBr$ as a soluble complex.



22. What are the products of electrolysis of concentrated common salt solution ?

Ans. NaOH, H₂, Cl₂

23. What happens when a standard solution of NaOH is left in air for a few hours ?

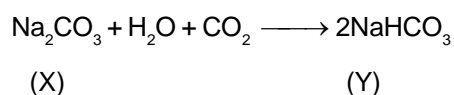
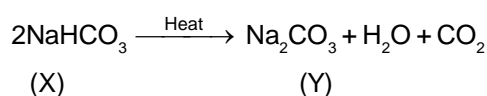
Ans. Strength will decrease of NaOH solution.

24. Which impurities in crude common salt are responsible for its hygroscopic nature ?

Ans. CaCl₂ and MgCl₂

25. CO₂ gas along with solid (Y) is obtained when sodium salt (X) is heated. (X) is again obtained when CO₂ gas is passed into aqueous solution of (Y). (X) and (Y) are :

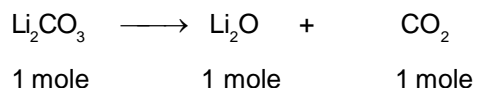
Ans. NaHCO₃, Na₂CO₃



26. On heating a mixture containing 1 mole each of Li₂CO₃ and K₂CO₃ ----- mole of ----- gas(es) is/are formed.

Ans. One mole of CO₂

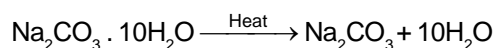
Sol. Li₂CO₃ decomposes while K₂CO₃ is stable and does not decompose.



27. There is loss in mass when mixture of Li₂CO₃ and Na₂CO₃·10H₂O is heated strongly. The loss is due to :

Ans. Both Li₂CO₃ and Na₂CO₃·10H₂O

Sol. $\text{Li}_2\text{CO}_3 \xrightarrow{\text{Heat}} \text{Li}_2\text{O} + \text{CO}_2$



28. Metal (M) + N₂ → Nitride $\xrightarrow{\text{H}_2\text{O}}$ NH₃. The metal (M) is -

Ans. Li, Mg

29. Na₂O₂ has light yellow colour. This is due to :

Ans. Presence of trace of NaO₂.

- 30.** Water is added to calcium carbide and the evolved gas is passed through dilute H_2SO_4 containing HgSO_4 . Which organic compound are formed ?
- Ans.** CH_3CHO
- Sol.** $\text{CaC}_2 + 2\text{H}_2\text{O} \longrightarrow \text{C}_2\text{H}_2 + \text{Ca(OH)}_2$
- $$\text{CH} \equiv \text{CH} + \text{HOH} \xrightarrow[\text{H}_2\text{SO}_4]{\text{HgSO}_4} \text{CH}_2 = \underset{\text{OH}}{\text{CH}} \rightleftharpoons \text{CH}_3 - \text{CHO}$$
- 31.** The nitrate (A) can be confirmed by flame test. The colour imparted by the salt to the flame is -
- Ans.** Green
- 32.** Why Gypsum is added to portland cement ?
- Ans.** To slow down the process of setting.
- 33.** A colourless gas which burns with blue flame and reduces CuO to Cu is -
- Ans.** CO
- 34.** Carbon has valency four in CH_4 . What is its valency in acetylene ?
- Ans.** 4
- 35.** Why H_2SO_4 is not used for the preparation of CO_2 from marble chips ?
- Ans.** Calcium sulphate is sparingly soluble and get deposited on marble chips and stops the reaction.
- 36.** Which type of glass has the smallest coefficient of thermal expansion ?
- Ans.** Pyrex glass
- 37.** How is colour is imparted to glass ?
- Ans.** By adding metal oxides
- 38.** In the ring test for nitrates, the ring formed is due to formation of -
- Ans.** $\text{FeSO}_4 \cdot \text{NO}$
- 39.** Oxalate + MnO_2 + dil. $\text{H}_2\text{SO}_4 \rightarrow$ Gas. The gas evolved is :
- Ans.** CO_2

40. A gas is evolved which burns with blue flame when the mixture is heated with conc. H_2SO_4 . The mixture contains :
- Ans.** Oxalate/Carbonate
41. Which metal sulphide is yellow in colour ?
- Ans.** ZnS / PbS
42. A mixture when rubbed with organic acid, smells like vinegar. It contains :
- Ans.** CH_3COO^- acetate
43. All ammonium salts liberate ammonia when -
- Ans.** Heated with caustic soda
- Sol.** $2\text{NH}_4\text{Cl} + 2\text{NaOH} \longrightarrow 2\text{NH}_3 + 2\text{NaCl} + 2\text{H}_2\text{O}$
44. Which of the following gives green colour to the flame ?
(i) BaCl_2 (ii) CaCl_2
- Ans.** BaCl_2
45. Which of the following compound does not dissolve in hot dil. HNO_3 ?
(i) HgS (ii) PbS
- Ans.** HgS
46. What is nessler's reagent ?
- Ans.** K_2HgI_4
47. An object is located at a height of 5 km from the surface of the earth. The object is located in which part of atmosphere ?
- Ans.** Troposphere
48. Which gases are absorbers of IR-radiation ?
- Ans.** Carbondioxide and chlorofluorocarbons.
49. Write formula for tear gas.
- Ans.** CCl_3NO_2
50. Which metal is used for drying organic solvents ?
- Ans.** Na