

# **Chemistry**

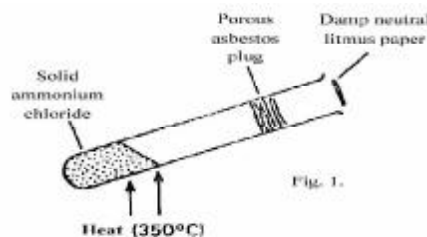
## **1983-2004**

**JAMB**

**Questions**

# Chemistry 1983

1. X is crystalline salt of sodium. Solution of X in water turns litmus red produces a gas which turns lime water milky when added to sodium carbonate. With barium chloride solution, X gives a white precipitate which is insoluble in dilute hydrochloric acid. X is
- A.  $\text{Na}_2\text{CO}_3$       B.  $\text{NaHCO}_3$   
 C.  $\text{NaHSO}_4$       D.  $\text{Na}_2\text{SO}_3$   
 E.  $\text{Na}_2\text{SO}_4$
2. The alkanol obtained from the production of soap is
- A. ethanol      B. glycerol  
 C. methanol      D. propanol  
 E. glycol
3. The flame used by welders in cotton metals is
- A. butane gas flame  
 B. acetylene flame  
 C. kerosene flame  
 D. oxy-acetylene flame  
 E. oxygen flame
4. Consecutive members of an alkane homologous series differ by
- A. CH      B.  $\text{CH}_2$   
 C.  $\text{CH}_3$       D.  $\text{C}_n\text{H}_n$   
 E.  $\text{C}_n\text{H}_{2n+2}$
5. If an element has the electronic configuration  $1s^2 2s^2 2p_6 3s^2 3p_2$ , it is
- A. a metal  
 B. an alkaline earth metal  
 C. an s-block element  
 D. a p-block element  
 E. a transition element
6. Some copper (II) sulphate pentahydrate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ), was heated at  $120^\circ\text{C}$  with the following results: Wt of crucible = 10.00 g; Wt of crucible +  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  = 14.98g; Wt of crucible + residue = 13.54g. How many molecules of water of crystallization were lost? [H=1, Cu =63.5, O=16, S= 32]
- A. 1      B. 2  
 C. 3      D. 4  
 E. 5
7. The three-dimensional shape of methane is
- A. hexagonal      B. trigonal  
 C. linear      D. tetrahedral  
 E. cubical
8. Compound W is
- A. a soap      B. an oil  
 C. an alkane      D. an ester  
 E. sucrose
9. The molecular formula of X is
- A.  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$       B.  $\text{C}_6\text{H}_{12}\text{O}_6$   
 C.  $\text{C}_3\text{H}_6\text{O}_3$       D.  $\text{C}_7\text{H}_{14}\text{O}_7$   
 E.  $\text{C}_4\text{H}_3\text{O}_4$
10. reaction of X with yeast forms the basis of the
- A. plastic industry  
 B. textile industry  
 C. brewing industry  
 D. soap industry  
 E. dyeing industry.
11. A mixture of common salt, ammonium chloride and barium sulphate can best be separated by
- A. addition of water followed by filtration then sublimation  
 B. addition of water followed by sublimation then filtration  
 C. sublimation followed by addition of water then filtration  
 D. fractional distillation  
 E. fractional crystallization.
12. Which of the following relationships between the pressure P, the volume V and the temperature T, represents and ideal gas behaviors?
- A. P & VT      B. P & T/V  
 C. PT & V      D. PV & VT  
 E. P & V/T
- 13.



In the above experiment (fig1) the litmus paper will initially

- A. be bleached      B. turn green  
 C. turn red      D. turn blue  
 E. turn black

14. The colour imparted to a flame by calcium ion is
- |              |           |
|--------------|-----------|
| A. green     | B. blue   |
| C. brick-red | D. yellow |
| E. lilac     |           |

15. In the reaction  $M + N \rightleftharpoons P$ ;  $\Delta H = + Q$  kJ. Which of the following would increase the concentration of the product?
- Decreasing the concentration of N
  - Increasing the concentration of P
  - Adding a suitable catalyst.
  - Decreasing the temperature

16. In which of the following processes is iron being oxidized?
- $Fe + H_2SO_4 \rightarrow H_2 + FeSO_4$
  - $FeSO_4 + H_2S \rightarrow FeS + H_2SO_4$
  - $FeCl + Cl_2 \rightarrow 2FeCl_3$
  - $FeCl_3 + SnCl_2 \rightarrow 2FeCl_2 + SnCl_4$
- |             |            |
|-------------|------------|
| A. 1 only   | B. 2 only  |
| C. 3 only   | D. 1 and 3 |
| E. 2 and 4. |            |

17.

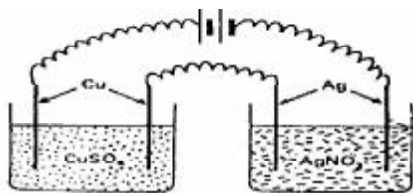


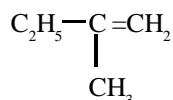
Fig. 2

Fig.2  
In the above experiment (fig.2), a current was passed for 10 minutes and 0.63 g of copper was found to be deposited on the cathode of  $CuSO_4$  cells. The weight of  $AgNO_3$  cell during the same period would be [Cu = 63, Ag = 108]

- |           |           |
|-----------|-----------|
| A. 0.54 g | B. 1.08 g |
| C. 1.62 g | D. 2.16 g |
| E. 3.24 g |           |

18. In the reaction  $Fe + Cu^{2+} \rightarrow Fe^{2+} + Cu$ , iron displaces copper ions to form copper. This is due to the fact that
- iron is in the metallic form while the copper is in the ionic form
  - the atomic weight of copper is greater than that of iron
  - copper metal has more electrons than iron metal
  - iron is an inert metal
  - iron is higher in the electrochemical series than copper.

19.



The correct name of the compound with the above structural formula is

- 2-methylbut-1-ene
- 2-methylbut-2-ene
- 2-methylbut-1-ene
- 2-ethylprop-1-ene
- 2-ethylprop-2-ene

20. How many isomeric forms are there for the molecular formula  $C_3H_6Br_2$ ?

- |      |      |
|------|------|
| A. 1 | B. 2 |
| C. 3 | D. 4 |
| E. 5 |      |

21. A piece of burning sulphur will continue to burn in a gas jar of oxygen to give misty fumes which readily dissolve in water. The resulting liquid is
- sulphur (IV) trioxide
  - Tetraoxosulphate acid (VI)
  - Trioxosulphate (IV) acid
  - Dioxosulphate (IV) acid
  - Hydrogen sulphide

22. Sodium decahydrate ( $Na_2SO_4 \cdot 10H_2O$ ) on exposure to air loses all its water of crystallization. The process of loss is known as

- |                  |                  |
|------------------|------------------|
| A. Efflorescence | B. Hygroscopy    |
| C. Deliquescence | D. Effervescence |
| E. Dehydration   |                  |

23. Which of the following happens during the electrolysis of molten sodium chloride?

- Sodium ion loses an electron
- Chlorine atom gains an electron
- Chloride ion gains an electron
- Sodium ion is oxidized
- Chloride ion is oxidized.

24. Crude petroleum pollutant usually seen on some Nigeria creeks and waterways can be dispersed or removed by.

- heating the affected parts order to boil off the petroleum
- mechanically stirring to dissolve the petroleum in water
- pouring organic solvents to dissolve the petroleum
- spraying the water with detergents
- cooling to freeze out the petroleum.

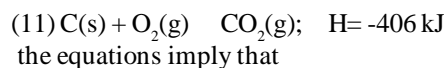
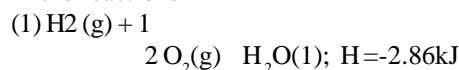
25. An element is electronegative if

- it has a tendency to exist in the gaseous form
- its ions dissolve readily in water
- it has a tendency to lose electrons
- it has a tendency to gain electrons
- it readily forms covalent bonds

26. Solution X, Y, and Z have pH values 3.0, 5.0 and 9.0 respectively. Which of the following statements is correct?

- All the solution are acidic
- All solution are basic
- Y and Z are more acidic than water
- Y is more acidic than X.
- Z is the least acidic

27. In the reactions



- A. more heat is absorbed heat is evolved in (1)  
 B. more heat is absorbed in (11)  
 C. less heat is evolved in (1)  
 D. reaction (11) proceeds faster than (1)  
 E. reaction (1) proceeds faster than (11)
28. Which of these metals, Mg, Fe, Pb, and Cu will dissolve in dilute HCl?  
 A. All the metals  
 B. Mg, Fe, and Cu  
 C. Mg, Fe and Pb  
 D. Mg and Fe only  
 E. Mg only
29. Stainless steel is an alloy of  
 A. Carbon, iron and lead  
 B. Carbon, iron and chromium  
 C. Carbon iron and copper  
 D. Carbon, iron and silver  
 E. Carbon and iron only
30. What volume of 0.50  $\text{MH}_2\text{SO}_4$  will exactly neutralize  $20\text{cm}^3$  of 0.1 M NaOH solution?  
 A.  $2.0\text{ cm}^3$                       B.  $5.0\text{ cm}^3$   
 C.  $6.8\text{ cm}^3$                       D.  $8.3\text{ cm}^3$   
 E.  $10.4\text{ cm}^3$
31. Which of the following pair of gases will NOT react further with oxygen at a temperature between  $30^\circ\text{C}$  and  $400^\circ\text{C}$ ?  
 A.  $\text{SO}_2$  and  $\text{NH}_3$               B.  $\text{CO}_2$  and  $\text{H}_2$   
 C.  $\text{NO}_2$  and  $\text{SO}_3$               D.  $\text{SO}_3$  and  $\text{NO}$   
 E.  $\text{CO}$  and  $\text{H}^2$
32. Some metals are extracted from their ores after some preliminary treatments by electrolysis (L) some by thermal reaction(T) and some by a combination of both processes(TL). Which set-up in the following for the extraction of iron copper and aluminum is correct?  
 A. Iron (L), copper (L) m aluminum (T)  
 B. Iron (T), copper (L), aluminum (T)  
 C. Ion (TL), copper (TL), aluminium (TL)  
 D. Iron (L), copper (T), aluminium (T).  
 E. Ion (T), copper (L), aluminium (TL).
33. In the preparation of some pure crystals of  $\text{Cu}(\text{NO}_3)_2$  starting with  $\text{CuO}$ , a student gave the following statements as steps he employed. Which of these shows a flaw in his report?  
 A. Some  $\text{CuO}$  was reacted with excess dilute  $\text{H}_2\text{SO}_4$   
 B. The solution was concentrated  
 C. When the concentrate was cooled, crystals formed were removed by filtration.  
 D. The crystals were washed with very cold water  
 E. The crystals were then allowed to dry.
34. Which of the following separation processes is most likely to yield high quality ethanol (>95%) from palm wine?  
 A. Fractional distillation without a dehydrant  
 B. Simple distillation without a dehydrant  
 C. Fractional distillation with a dehydrant  
 D. Column chromatography  
 E. Evaporation
35. Increasing the pressure of a gas  
 A. lowers the average kinetic energy of the molecules  
 B. decreases the density of the gas  
 C. decreases the temperature of the gas  
 D. increases the density of the gas  
 E. increases the volume of the gas.
36. 2.5 g of a hydrated barium salt gave on heating, 2.13 g of the anhydrous salt. Given that the relative molecular mass of the anhydrous salt is 208, the number of molecules of water of crystallization of the barium salt is  
 A. 10                                      B. 7  
 C. 5                                        D. 2  
 E. 1
37. 3.06 g of a sample of potassium trioxochlorate (v) ( $\text{KClO}_3$ ) was required to make a saturated solution with  $10\text{cm}^3$  of water at  $25^\circ\text{C}$ . The solubility of the salt at  $25^\circ\text{C}$  is [K =39, Cl =35.5, O=16]  
 A. 5.0 moles  $\text{dm}^3$               B. 3.0 moles  $\text{dm}^3$   
 C. 2.5 moles  $\text{dm}^3$               D. 1.0 moles  $\text{dm}^3$   
 E. 0.5 moles  $\text{dm}_3$
38. The cracking process is very important in the petroleum industry because it  
 A. gives purer products  
 B. Yields more lubricants  
 C. Yields more engine fuels  
 D. Yields more asphalt  
 E. Yield more candle wax
39. A gas that can behave as reducing agent towards chlorine and as an oxidizing agent toward hydrogen sulphide is  
 A.  $\text{O}_2$                                       B.  $\text{NO}$   
 C.  $\text{SO}_2$                                       D.  $\text{NH}_3$   
 E.  $\text{CO}_2$
40. Which if the following solution will give a white precipitate with barium chloride solution and a green flame test?  
 A.  $\text{Na}_2\text{SO}_4$                               B.  $\text{CuSO}_4$   
 C.  $\text{CaSO}_4$                                 D.  $\text{CaCl}_2$   
 E.  $(\text{NH}_4)_2\text{SO}_4$
41. The mass of an atom is determined by  
 A. its ionization potential  
 B. its electrochemical potential  
 C. the number of protons  
 D. the number of neutrons and protons  
 E. the number of neutrons and electrons
42. Which of the following is neutralization reaction?  
 A. Addition of chloride solution  
 B. Addition of trioxonirate (V) acid (nitric acid) to distilled water.  
 C. Addition of trioxonirate (V) acid (nitric acid) to tetraoxosulphate (VI) acid (sulphuric acid).



















































































































































