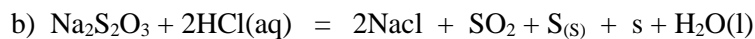


CHEMISTRY PAPER 1 MARKING SCHEME

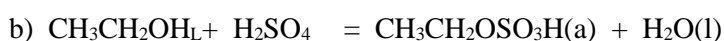
1. a) It absorbed moisture from air
b) Used as a drying agent
2. a) $(C_2H_3)_n = 54$ $27n = 54$ $n = 2$
 $(12 \times 2) + (1 \times 3)_n = 54$ MF C_4H_6
- b) $H - C = C - C - C - H$ But -1
3. i) it decreases as temperature increases
ii) Exothermic, as the volume of SO_3 decreases in temperature increases.
4. i) C and D
ii) Endothermic
iii) heat of solution = lattice energy + hydration energy
 $+ 2493 + -1891 + (-840 \times 2)$
 $+2493 - 3571$
 -1078kJ/mol
5. diagram
- a) Its explosive if ignited in air
b) Reduction
c) Manufacture of Ammonia
Manufacture of Hydrochloric acid.
6. a) $2NaOH(aq) + Cl_2(g) \rightarrow NaCl(aq) + NaOCl(aq) + H_2O(l)$
- b) sodium chlorate (I)
 $NaOCl(aq) + dye \rightarrow NaCl(aq) + (dye + O)$
7. Isomers are compound with the same molecular formula but different structure formula white isotopes are atoms with same atomic no. but different mass number.
8. $(NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l)$
 20cm^3 15cm^3 , 1m
 Moles of HCl = $\frac{15 \times 1}{1000} = 0.015\text{moles}$
 Mole ratio NaOH; HCl 1 : 1
 Mole of NaOH = 0.015moles
 $0.015 \text{ moles} = 20\text{cm}^3$
 $\frac{250\text{cm}^3}{20} \times 0.015 = 0.1875$
 $2\text{fm of NaOH} = 23 + 176 + 1 = 40$
 Press = $40 \times 0.1875 = 7.5\text{g}$
 Percentage $\frac{7.5 \times 100}{10} = 75\%$

9. a) $(+1 \times 2) + 25 + (-2 \times 3) = 0$
 $+ 2 + 25 - 6 = 0$
 $25 = +4$
 $5 = +2$



- d) - Preparation of Cathodesulphur
 - Determining reaction rate

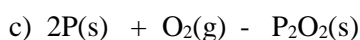
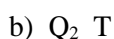
10. a) R - concentrated sulphuric (VI) acid
 T - ethyl hydrogen sulphate



11. a) i) sugar = Dehydrating agent
 ii) Copper metal = Oxidising agent

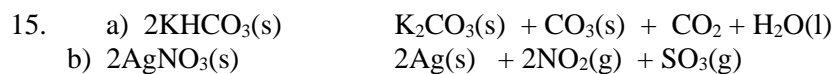


12. a) P 2 : 8 : 1 R 2 : 8 : 3
 Q 2 : 8 : 8 : 1 T 2 : 8 : 6



13. a) is more reactive than E
 Reason.
 D requires less energy to lose electron from the outmost energy level

14. i)
 ii) Max mass of a solute that dissolves in 100g of water at a particular temperature
 iii) Extraction of sodium chloride in Magadi



16. a) Charles Law

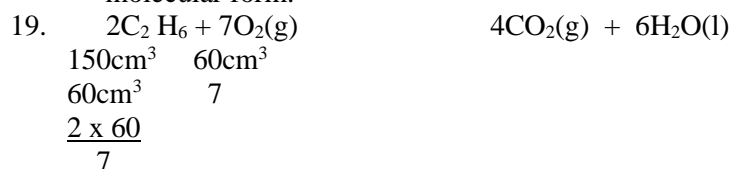
The volume of a given mass of a gas is directly proportional to absolute temperature at constant pressure.

b) $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$
 $\frac{98.31 \times 146}{297} = \frac{13.5 \times 101.32J}{T_2}$
 $T_2 = \frac{297 \times 135 \times 101.325}{98.31 \times 146}$
 $T_2 = 283\text{K}$
 Or 10°C

17. The PH of X_2O in water is higher than YO_2 since it forms a basic solution while YO_2 forms on

acidic solution.

18. a) Strong acid ionizes completely in solution while concentrated acid contain high number of acid molecules per given volume.
 b) Ammonia in water dissociate to produce hydroxide ion while in methybenze it remain in molecular form.



= 17.14cm³ of ethane required.

Volume of CO₂formed = 34.28cm³

Volume of excess ethane = 132.86cm³

20. a) Ammonium ion

H = 1, N= 7

NH₄⁺

b)

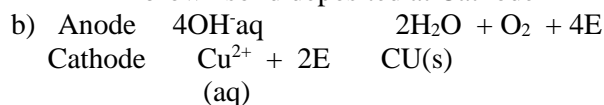
21.

22. (a) IV
 (b) I and IV Al₂O₃ is amphoteric

23.

- a) B A C
 b) C

24. a) - The blue colour of solution fades
 - A brown solid deposited at Cathode



25. (a) The rate of diffusion of a given volume of a gas is inversely proportional to square not of its density at constant temperature and pressure.

b) $\frac{\text{Rate } D}{\text{Rate } O_2} = \frac{\sqrt{(mmO_2)} \frac{400}{50}}{MMD} = 8, \frac{600}{30} = 20$

$$\frac{\text{Rate } D}{\text{Rate } O} \sqrt{\frac{32}{mmD}} \frac{8}{20} = \sqrt{\frac{32}{mmD}} D = 199.9$$

$$\sqrt{mmD} = 20/8 \times \sqrt{32}$$

$$JmmD = 14.14$$

26. $Ca + 3/2 O_2 + C \xrightarrow{\Delta} CaCO_3$
 $O_2 \xrightarrow{\Delta} O_2$
 $CaO + CO_2$

$$\begin{aligned}\Delta H_4 &= \Delta H_1 + \Delta H_2 + \Delta H_3 \\ -1207 &= -635 - 394 + \Delta H_3 \\ -1207 + 635 + 394 &= \Delta H_3 \\ \Delta H_3 &= -178 \text{ kJ/mol}\end{aligned}$$

27. Add excess lead (II) carbonate to dilute nitric (v) acid
Filter the mixture to obtain lead (II) nitrate as filtrate. Add dilute hydrochloric acid to filtrate and filter. Rinse the residue with distilled water and dry between filter paper.

28. $Q = it$
 $Q = 1.5 \times 15 \times 60 = 1350 \text{ C}$

b) (96500×2)
 1350 C
 $\frac{96500 \times 2 \times 0.26}{1350} = 37.17$

