**CHEMISTRY PAPER 1**

**MARKING SCHEME**

1 a) It absorbed moisture from air

b) Used as a drying agent

2. a) (C2H3)n = 54 27n = 54 n = 2

 (12 x 2) + (1 x 3 )n = 54 MF C4 H6

b) H – C = C – C - C – H But -1

3. i) it decreases as temperature increases

ii) Exothermic, as the volume of SO3 decreases in temperature increases.

4. i) C and D

ii) Endothermic

iii) heat of solution = lattice energy + hydration energy

 + 2493 + -1891 + (-840 x 2)

 +2493 - 3571

 -1078kj/mol

5. diagram

1. Its explosive if ignited in air
2. Reduction
3. Manufacture of Ammonia

Manufacture of Hydrochloric acid.

6. a) 2NaOH(aq) + Cl2(g) NaCl(aq) + naOCl(aq) + H2O(l)

b) sodium chlorate (l)

NaOCl(aq) + dye 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) NaCl(aq) + H2O(l)

20cm3 15cm3, 1m

Moles of HCl= 15 x 1 = 0.015moles

 1000

 Mole ratio NaOH; HCl 1 : 1

Mole of NaOH = 0.015moles

 0.015 moles = 20cm3

 250cm3

 250 x 0.015= 0.1875

 20

 2fm of NaOH = 23 + 176 + 1 = 40

 Press = 40 x 0.1875 = 7.5g

 Percentage 7.5 x 100 = 75%

 10

9. a) (+1 x 2) + 25 + (-2 x 3) = 0

+ 2 + 25 – 6 = 0

 25 = +4

 5 = +2

b) Na2S2O3 + 2HCl(aq) = 2Nacl + SO2 + S(S) + s + H2O(l)

1. - Preparation of Cathodesulphur
* Determining reaction rate

10. a) R - concentrated sulphuric (VI) acid

T - ethyl hydrogen sulphate

b) CH3CH2OHL+ H2SO4 = CH3CH2OSO3H(a) + H2O(l)

11. a) i) sugar = Dehydrating agent

ii) Copper metal = Oxidising agent

b) Cu + 2H2SO4(l) CUSO4(aq) + SO2 + 2H2O(l)

12. a) P 2 : 8 : 1 R 2 : 8 : 3

Q 2 : 8 : 8 : 1 T 2 : 8 : 6

b) Q2 T

c) 2P(s) + O2(g) - P2O2(s)

13. a) is more reactive than E

 Reason.

 D requires less energy to lose electron from the outmost energy level

14. i)

ii) Max mess of a solute that dissolves in 100g of water at a particular temperature

iii) Extraction of sodium chloride in Magadi

15. a) 2KHCO3(s) K2CO3(s) + CO3(s) + CO2 + H2O(l)

b) 2AgNO3(s) 2Ag(s) + 2NO2(g) + SO3(g)

16. a) Charles Law

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

b) P1 V1 = P2V2

 T1 T2

98.31 x 146 = 13.5 x 101.32J

 297 T2

T2 =297 x 135 x 101.325

 98.31 x 146

 T2 = 283K

 Or 100C

17. The PH of X2O in water is higher than YO2 since it forms a basic solution while YO2 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.

19. 2C2 H6 + 7O2(g) 4CO2(g) + 6H2O(l)

150cm3 60cm3

60cm3 7

2 x 60

 7

= 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 Al2 O3 is amphoteric

23.

1. B A C
2. C

24. a) - The blue colour of solution fades

- A brown solid deposited at Cathode

b) Anode 4OH-aq 2H2O + O2 + 4E

 Cathode Cu2+ + 2E CU(s)

 (aq)

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.

$b) \frac{Rate D }{Rate O₂}$ = $\frac{√(mmO₂)}{MMD}\frac{400}{50}$= 8, $\frac{600}{30}$ = 20

$\frac{Rate D}{Rate O}$- $\sqrt{\frac{32}{mmD}}\frac{8}{2O}$- $\sqrt{\frac{32}{mmD}}$D = 199.9

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

 JmmD = 14.14

26. Ca + 3/2 O2 + C △H4 CaCO3

O2△H O2△H2△H3

CaOs+ CO2

△H4 = △H1 + △H2 + △H3

- 1207 = -635 \_ -394 + △H3

-1207 + 635 + 394 = △H3

△H3 = -178kj/mol

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 x 15 x 60 = 1350C

b) (96500 x 2 )

 1350C

96500 x 2 x 0.26= 37.17

 1350

29. Q(s) + 2Ag+ ↔ Q2+(aq) + 2Ag(s)

Q(s) ↔ Q(aq) - 2e - 0.13V

2Ag+ + 2e Ag + 0.8Q

Q(s) + 2Ag+(aq) ↔ Q2+ (aq) Q2+ (aq) + 2Ag(s) + 0.67V

The reaction will occur.