CHEMISTRY PAPER 1 233/1
MARKING SCHEME

1.(a) 2.86

(b) (i) p - 11

(ii) y - 16

(c) p_2 y

2. Mass of hydrated salt 33.111g

- 30.296g

2.815

Mass of anhydrous salt 32.781

- 30.296

2.485

Mass of water 2.815 - 2.485 = 0.33

$CaSo_4$	H_2O
2.485	0.33
136	18
0.01827	0.01833
0.01827	0.01827
1:1	

Ca SO_4. H_2O

3(a) Dynamic equilibrium is a state in reaction where both the forward and the backward reaction occur at the same rate.

(b) Backward reaction will be favoured/reaction will shift towards the reactants side/left hand side. This is because addition of magnesium will lead to reaction between magnesium and water hence production of more hydrogen.

4. – Butanoic acid.

- propanol

5. Burn copper in oxygen to form copper (II) oxide.
- Add the oxide in dilute hydrochloric acid in excess.
- Filter to obtain filtrate
- Evaporate the filtrate not to dryness.

6.(a) The rate of diffusion is inversely proportional to the square root of density provided the physical conditions is kept constant.

(b) $\frac{Rw}{Rx} = \sqrt{\frac{mx}{mw}}$

$\frac{12}{Rx} = \sqrt{\frac{16}{44}}$

$Rx = 19.8997\ cms^{3-1}$

7. (a) $A_{(s)}/A^{2+}_{(aq)}$ // $2C^{+}_{(aq)}$ / 2 $C_{(s)}$

(b) The colour of solution turns to blue.
There is silver deposit
Copper is oxidized to copper (II) ions while silver ion is reduced to silver.

8. (a) I Nuclear fusion
II Nuclear fission

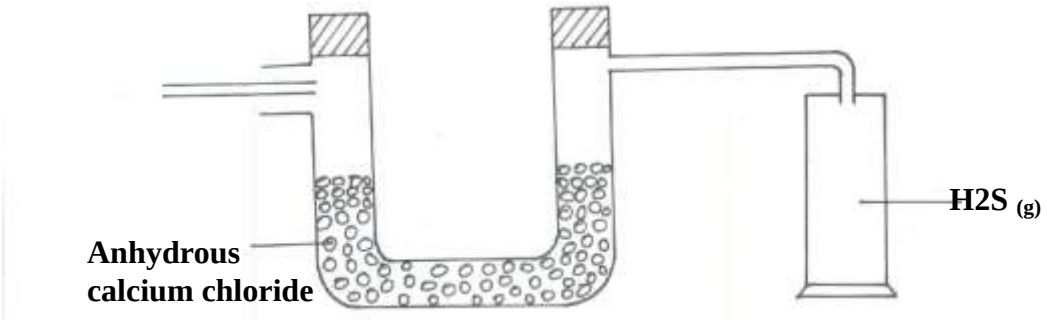
(b)

Chemical Reaction	Nuclear Reaction
- involves valency electron	- involves the proton and neutron
- Little amount of energy released	- Involves large amount of energy

9.(a) (i) Mn + 4 (-2) = 1
Mn = 1 + 8
Mn = + 7
(ii) Mn + (-2) = 0
Mn = + 2

(b) $Mn^{+7} \longrightarrow Mn^{+8}$
Oxidized
Manganese has lost an electron to be oxidized to manganese of positive +8

10.

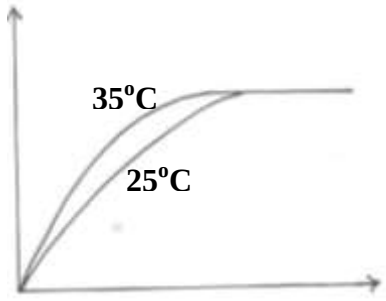


11. Mass CH_3 COOH used = 15 x 1.05
= 15.75g
Moles of CH_3 COOH = $\frac{15.75}{60}$ = 0.2625 moles

$500cm^3$ = **0.2625 moles**
1000 = $\frac{1000 \times 0.2625}{500}$
= 0.525MCH_3COOH

12. (a) Amphoteric hydroxide
(b) Aluminium hydroxide
- zinc hydroxide
- lead hydroxide

13 (a) Syringe
(b) (i)



(ii)Temperature increases the kinetic energy of particles hence increasing the collision between the reactants and this Makes the rate of reaction to increase.

14. Mass of carbon used = 1.9053g - 1.804
= 0.1013g
Number of moles of carbon used = $\frac{0.1013}{12}$
= 0.008442 moles
Number of atoms used = 0.008442 x 6.00 x 10^{23}
= 5.0652 x 10^{21} atoms

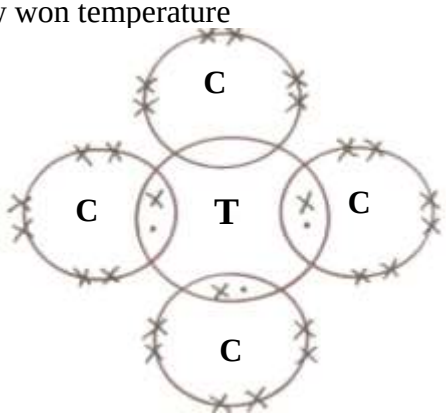
15. (a) HOOC - C_6H_4 - COOH + HO (CH_2) 2OH
HO –c - C_6H_4 – C-O – CH_2 CH_2 OH + H_2O

(b) Condensation polymensation

16 (i) C

Because its melting point is below won temperature

(ii)



17. NH_4^+/H_3O^+

NH_4^+ donates proton in forward reaction

H_3O^+ donates proton in backward reaction.

18. (a) The a colour of sodium Iodide changes to brown

$CL_{2\,(g)} + 2\,I_{(AQ)} + I_2$ (1)

(b) Covalent

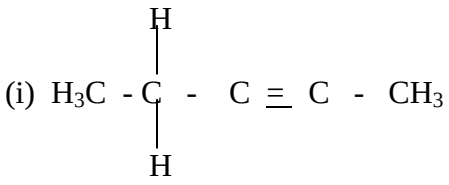
Both are non metals

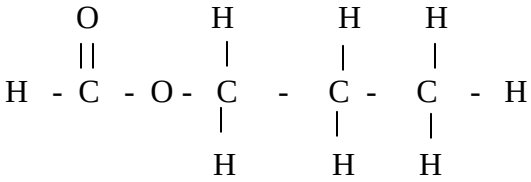
19. (a) Zinc hydroxide

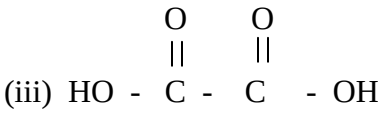
(b) $Zn^{2+}(aq + 2OH\,(aq) \longrightarrow Zn\,(OH)_2\,(s)$

(c) $[\,Zn\,(NH_3)_4]^{2+}$

20.

(i) 

(ii) 

(iii) 

21. (a) (i) $NO_{2\,(g)}$

(ii) $O_{2\,(g)}$

(b) $Zn^{2+}{}_{(aq)}$ and $NO^-{}_{3\,(aq)}$

22. (a) Water, Ammonia, carbon (iv) oxide

(b) $Ca^{2+}(aq) + CO_3^{2-}(aq) \longrightarrow CaCO_3\,(aq)$

$Mg^{2+}(aq) + CO_3{}^{25}(aq) \longrightarrow MgCO_{3\,(s)}$

23. Number of moles $= \frac{8.5}{34} = 0.25$ moles

Amount of heat = 0.25 x 92
= 24.5KJ

Heat = MCΔθ

$\Delta\theta = \frac{\text{Heat}}{\text{Mc}} = \frac{24500}{100 \times 4.2} =$ **58.3K**

24.(a) The air is compressed to a pressure of 200 atmosphere
- cooled to a temperature of -200^0C
- Fractional distillation of liquidfied air is done and oxygen is obtained at -86^0C

(b) Concentrated sulphuric (VI) acid

25.(a) The brown solid turns to grew solid.

(b) $Fe_2O_{3\,(s)} + 3CO_{(g)} \longrightarrow 2\,Fe_{(s)} + 3CO_{2\,(g)}$

26.(a) Mass of burning gases

(b) Non-luminous flame