

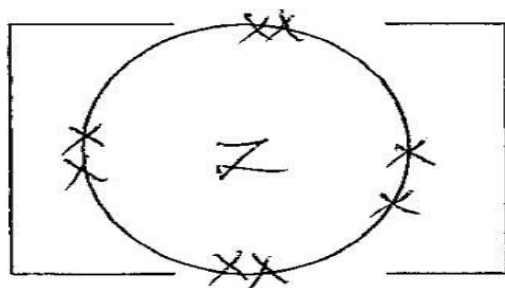
TERM TWO

CHEM P2 FORM 3

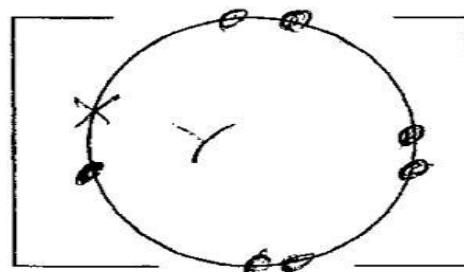
MARKING SCHEMES

- a) 1.(a) Alkali metals
- b) (i) GR_2 OR CO_2
- c) (ii) covalent bond
- d) Z – It has 4 energy levels hence its outermost electron is weakly held by the nucleus hence has greater tendency to lose electrons.
- e) T_2O
- f) T_2O_2
- g) It is below P
- h) Ionic radius of W is greater than that of S. W has an energy 3 level while S has 2 energy levels.

i)



+



2.

- a) $\text{Mg}_{(s)} + 2\text{HCl} \longrightarrow \text{MgCl}_{2(aq)} + \text{H}_2(g)$
- b) Scale -1
- c) Plotting – 1
Curve – 1
- d)
 - (i) $150 \pm 2\text{cm}^3$
 - (ii) 30cm^3
- e) $\text{Mg}_{(s)} + 2\text{HCl}_{(aq)} \longrightarrow \text{MgCl}_{2(aq)} + \text{H}_2(g)$
 Mole ratio 1:2
 If $24,000\text{cm}^3 = 1 \text{ mole}$
 Therefore $300\text{cm}^3 = \frac{300 \times 1}{24,000}$
 $= 0.0125 \text{ mole}$

$$\text{Moles} = \frac{\text{mass}}{\text{Rmm}}$$

$$\text{Rmm} = \frac{0.3}{0.0125}$$

$$= 24\text{g}$$

3.

- a)
 - (i) Fractional distillation of liquid air
 - (ii) Natural gas
By product of cracking of long chain alkanes
- b)
 - Carbon (iv) oxide
 - Sulphur (iv) oxide
 - Dust particles
- c) Temp – 500°C
Pressure – 200 atmospheres
- d) The compression enhances faster reaction between $\text{N}_2(\text{g})$ and $\text{H}_2(\text{g})$ hence increases high yield of Ammonia.
- e) Iron to reduce wastage
- f)
 - As a fertilizer
 - As a refrigerant
 - Softening hard water
 - Removal of greasy stains
 - Manufacture of hydrazine used in rocket fuels
- g) The black CuO turns to a red brown is related to Cu(s) by ammonia
- h) $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$

$$V_2 = \frac{250 \times 200 \times 273}{293 \times 300}$$

$$= 155.29\text{cm}^3$$

1.

- a) A salt is a substance found when the Hydrogen ion of an acid is replaced directly or indirectly by a metal or ammonia ion.
- b)
 - (i) Deliquescent salt – is one which absorbs water from the atmosphere to form a solution.
Hygroscopic salt – is one which absorbs water from the atmosphere but does not form solution.
 - (ii) Used as a drying agent.
- c)
 - (i) Oxygen gas $\text{O}_2(\text{g})$
 - (ii) Thermal decomposition
- d) Add water to the mixture, NaCl dissolves while CuO does not. Filter and heat the filtrate to dryness then cool the NaCl crystals.
- e)
 - (i) $\text{Pb}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \longrightarrow \text{PbSO}_4(\text{s})$
 - (ii) $\text{Pb}(\text{NO}_3)_2 + \text{Na}_2\text{SO}_4 \longrightarrow \text{PbSO}_4 + 2\text{NaNO}_3$
 Moles of Pb : $\frac{3.4}{207} = 0.016425$
 Mole Ratio $\text{Pb} : \text{PbSO}_4$
 1:1
 Therefore moles of $\text{PbSO}_4 = 0.016425$
 Hence mass = 0.016425×303
 (Rmm = $207 + 207 + 32 + 64 = 303$)
 Therefore mass = 4.9768g

2.

- a)
 - (i) 2-methylbutane
 - (ii) Pent-2-ene
 - (iii) Propyne

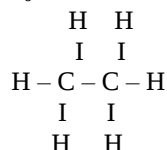
b)

(i) $C_n H_{2n+2}$

(ii) Alkanes

(iii) $C_2H_6 = 12 \times 2 + 6 \times 1 = 30$

(iv) $C_2 H_6$



c)

(i) Hydrogen chloride gas

(ii) Hydrogen gas

(iii) Soda lime (sodium hydroxide)

(iv) $2C_2H_2(g) + 5O_2(g) \longrightarrow 4CO_2 + 2H_2O(l)$

(v) Polymerization

d) $C_xH_y + 3O_2(g) \longrightarrow 1CO_2(g) + 1H_2O(l)$

$$\begin{array}{ccc} \text{Mass } 50.28\text{g} & & 2.16\text{g} \\ \text{Moles } \frac{50.28}{44} = 0.12 & & \frac{2.16}{18} = 0.12 \end{array}$$

Molar Ratio = 1:1

Hence $C_xH_y \longrightarrow C_1H_2$ therefore EF $\longrightarrow CH_2$

3.

a) $2Pb(NO_3)_2(s) \longrightarrow 2PbO(s) + 4NO_2(g)$

b)

(i) Oxygen gas

(ii) Dinitrogen tetra oxide

c) Nitrogen (IV) Oxide is easily liquefied

d)

- It is red brown in colour
- Has a pungent, irritating smell
- It is denser than air
- Is soluble in water
- Is easily liquefied to form yellow N_2O_4
- Is poisonous

e)

(i) Burning Nitrogen Magnesium alit of heat which makes NO_2 to dissociate to NO and $O_2(g)$ which supports burning.

(ii) $4Mg(s) + 2NO_2(g) \longrightarrow 4MgO(s) + N_2(g)$

f) It should be prepared in a fume chamber or open space.

This is because $NO_2(g)$ is poisonous.

g) $Pb(NO_3)_2(aq) + 2NaCl(aq) \longrightarrow PbCl_2(s) + 2NaNO_3(aq)$

Mole ratio 1:2

Moles = $\frac{8.34}{278}$

Therefore mass = $0.06 \times 58.5 = 3.51$

4. A)

a) Period 4

b) $B^{3+} - 2.8$ $D - 2.8.8$

c) D

d) C

e) D – Its melting point is -101°C therefore at room temperature (25°C) it has already melted into a liquid.