**MWAKICAN JOINT EXAMINATION CHEMISTRY FORM 4 PAPER 2**

**MARKING SCHEME**

1. i) A,G ( ½ mk for each)

reason: Their ionic radius is bigger than their atomic radius (1mk)

ii) Ioning bonding (1mk)

iii) JA2 (1mk)

iv) The oxide of G contains simple molecular (1mk) structure since both elements are non-metals while that of E is Grant ionic(1mk) structure since E is a metal while oxygen is a non metal.

v) D and A (1mkboth must be correct) D is the metal withlargest atomic rasius while A is the non metal with the smallest atomi radius (1mk)

vi) E (1mk) its oxide has the highest melting point (1mk)

1. a) i) C3H8 - Alkanes ( ½ mk)

C3H6 - Alkanes ( ½ mk)

ii) C3H6 decolourises potassium manganate (1mk) VII/Bromine water while C3H8 does not (1mk)

b) a)i) Dehydration (1mk)

ii) Hydrogenation (1mk)

b) Sodalime (1mk)

c) Polythene ( ½ mk)

polymerization ( ½ mk)

d) Tetrachloromethane (1mk)

Cl

Cl= C - Cl (1mk)

Cl

(1mk)

e) n = 44800 = 1600 (1mk)

28

f) Hardening of oils into fat (1mk)

1. a) Graph – labeling axis ( ½ mk for each )

ploting - 1mk if 5 points correctly plotted.

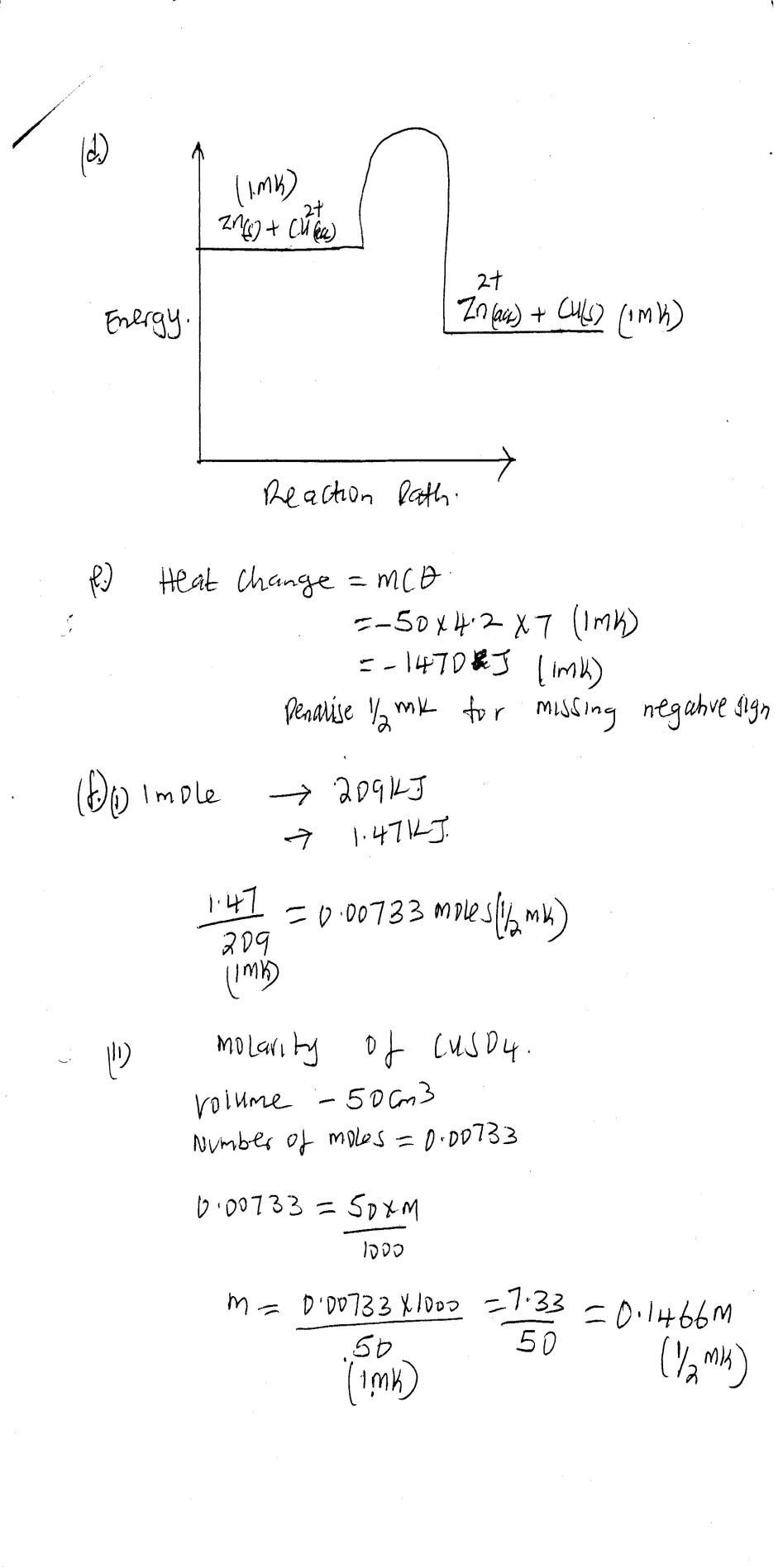
½ mk if 3-5 points correctly plotted.

shape of the graph - rise in temp then constant (1mk)

b) 7°C (1mk)

c) Zn + Cu2 + Cu Zn2+ (1mk)

(s) (aq) (s) (aq)



e) Heat change = mcθ

= - 50x 4.2 x 7 (1mk)

= - 1470J (1mk)

Penalize ½ mk for missing negative sign

f) i) 1mole 209KJ

1.47 KJ

1.47 = 0.00733Moles ( ½ mk)

209 (1mk)

ii) Molarity of CuSO4

volume - 50cm3

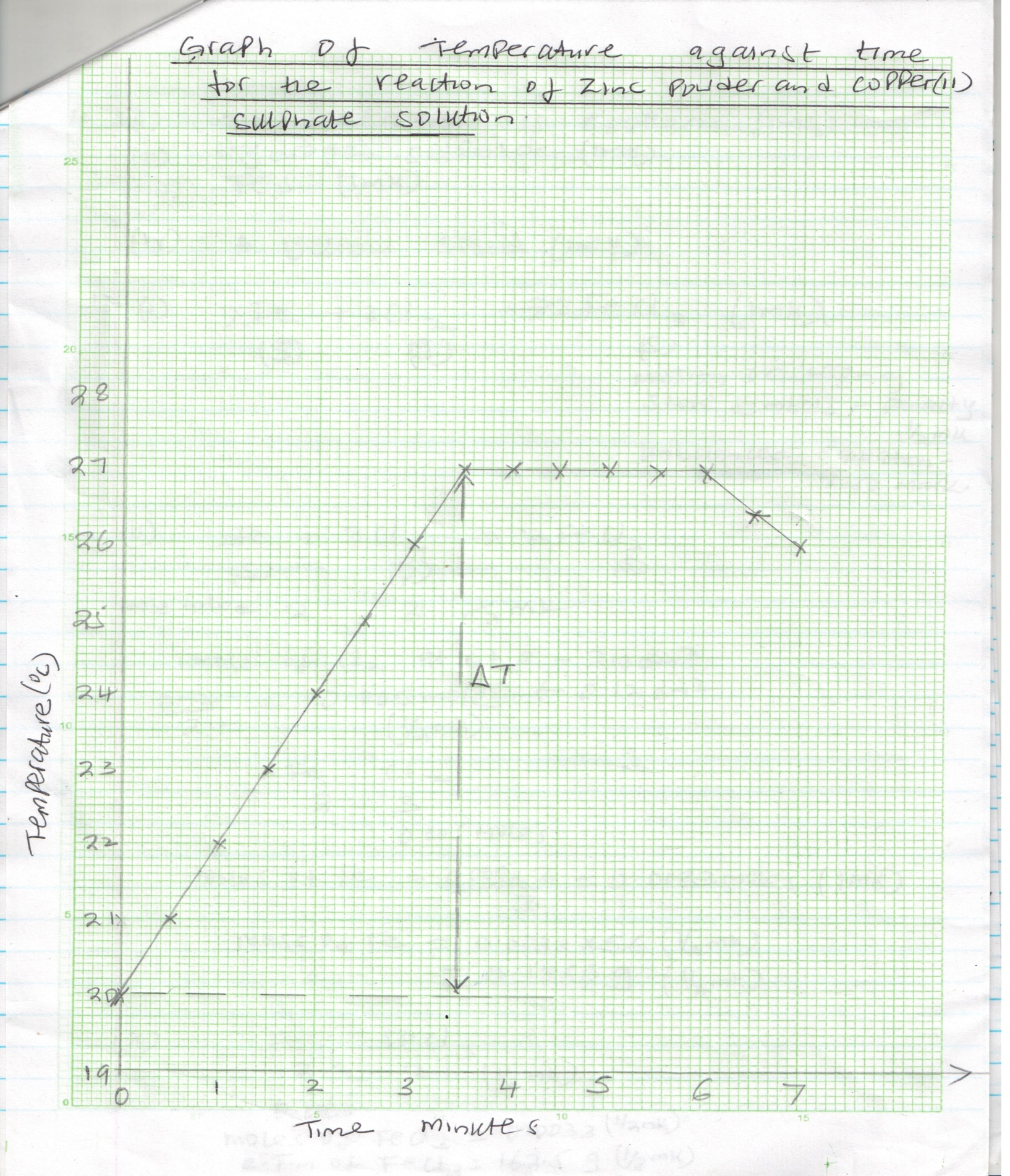
number of moles = 0.00733

0.00733 = 50 x m

1000

M = 0.00733 X 1000 = 7.33 = 0.1466 ( ½ mk)

50 (1mk) 50



1. a) i) The reaction is exothermic (1mk)

ii) Hydrogen sulphide (1mk)

Fes (1mk)

iv) A yellow solid (1mk)

b) i) 2Fe + 3Cl2 2FeCl3 (1mk)

(s) (g) (s)

missing or wrong state symbols – penalty ( ½ mk)

unbalanced equation – zero mark

ii) 2Fe + 3Cl2 2FeCl3

(s) (g) (s)

mole ration 2: 3 ( ½ mk)

1 mole of Cl2 at r.t.p - 24dm3

0.12 = 0.005 moles 0.12 dm3

24 ( ½ mk)

Fe : Cl

2 : 3

0.005moles

moles of Fe = 0.005 x2 = 0.0033 moles (1mk)

Mass of Fe = 0.0033 x 56 ( ½ mk)

= 0.1866g ( ½ mk)

iii) Fe : FeCl3

2 : 2 ( ½ mk)

0.0033

moles of FeCl3 = 0.0033 ( ½ mk)

R.F.M of FeCl3 = 162.5 g ( ½ mk)

mass of FeCl3 = 0.0033 x 162.5 g (1mk)

= 0.53625 g ( ½ mk)

1. a) i) Oxygen gas (1mk)

ii) 4OH - -4e 2H2O + O2 (1mk)

(aq) (l) (g)

iii) Relights a flowing splint (1mk)

iv) Decreases (1mk) because of the increase in (1mk) concentration of H+ ions as the Cu2+ are discharged

b) Anode - Cu – ze Cu2+ (1mk)

(s) (aq)

Cathode - Cu2+ +ze Cu (1mk)

(aq) (s)

c) The blue colour fades (1mk) with time because as copper ions are discharged they are not replaced (1mk)

d) - Electroplating

- extraction of metals

- refining of metals ( any two 1mk each)

1. a) i) Lead(ii) hydroxide or Pb (OH)2 (1mk)

ii) Cl- or Chloride ion (1mk)

iii) Lead oxide r Pbo (1mk)

b) Pb2 + + 2OH Pb (OH)2

(aq) (aq) (s) (white ppt)

c) A white precipitate ( ½ mk) which does not dissolve ( ½ mk) in excess ammonia solution

d) i) The enthalpy change when one mole of a compound dissolves in water forming an infinitely dilute solution (1mk)

ii) a) H1 - Lattice energy (1mk)

H2 – Heat of solution (1mk)

b) H2 = H1 + H3

-(2237 + -2378) KJ (1mk)

= - 141KJ (1mk)

1. a) i) X – Carbon(IV) Oxide (1mk)

Y – Calcium hydroxide (1mk)

ii) Ammonia ( ½ mk)

Carbon(iv) oxide ( ½ mk)

iii) S – Decomposition (1mk)

R - Filtration (1mk)

iv) Lowering melting point of NaCl during extraction of Na.

* As a drying agent (1mk for any one)

v) Q – NH4OH + NaCl + CO2 NH4CL + NaHCO3

(aq) (aq) (g) (aq) (aq) (1mk)

T - CaO + H2O Ca(OH) 2 (1mk)

(s) (l) (aq) (1mk)

b) Na2CO3 + Mg SO4 MgCO3  + Na2SO4

aq) (aq) (s) (aq) (1mk)

**or** Na2CO3 + Ca SO4 CaCO3  + Na2SO4

aq) (aq) (s) (aq)

(any one1mk)

c) -Manufacture of glass

- making soaps and detergents

-manufacture of paper

(any one -1mk)

d) i) Na2Co3 + 2HCl 2NaCl + CO2 + H2O (1mk)

(s) (aq) (aq) (g) (l)

ii) Mole ration 1: 2

1Mole of Co2 at s.t.p - 22.4dm3

moles of CO2 produced - 672

22400

moles of NaCo3 = 0.03 = 0.03 Moles ( ½ mk)

0.03 = 30x M ( ½ mk)

1000

M = 0.03 x 1000 = 3 = 1M (1mk)

30 3

iii) Value of x = 0.03 x 10

R.F.M of Na2Co3 = 3.18g

=106g x =3.18g