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**FORM 4**

**CHEMISTRY PAPER 2**

**TRIAL 2, 2019**

**MARKING SCHEME.**

1. Q √1

* Sharp/ constant melting point and boiling point.

ii) Melting point – lower the M.P √ ½

Boiling point – raises the b.p√ ½

b) B – Melting √

D - Condensation√1

ii) Sublimation √1

iii) Iodine √ ½

* Ammonium chloride √ ½ Any two 1mk.
* Solid ice √ ½
* Iron (III) chloride√
* Aluminum chloride √ ½

iv) Exothermic √ ½

Involves heat loss ½

1. a) Nitrogen gas√ 1

b) i)Carbon (iv) oxide gas√1

ii)Oxygen gas√1

iii) Nitrogen√1

c) To remove/absorb water vapour or dry / drying agent.

d)i) 2 NaOH(Aq) +CO2(g) Na2CO3(S)+H2O (L)√1

ii)3Mg (s) +N2 (g) Mg3N2(S)√1

Penalize ½ if state symbols miss/wrong

Penalize fully if not balanced.

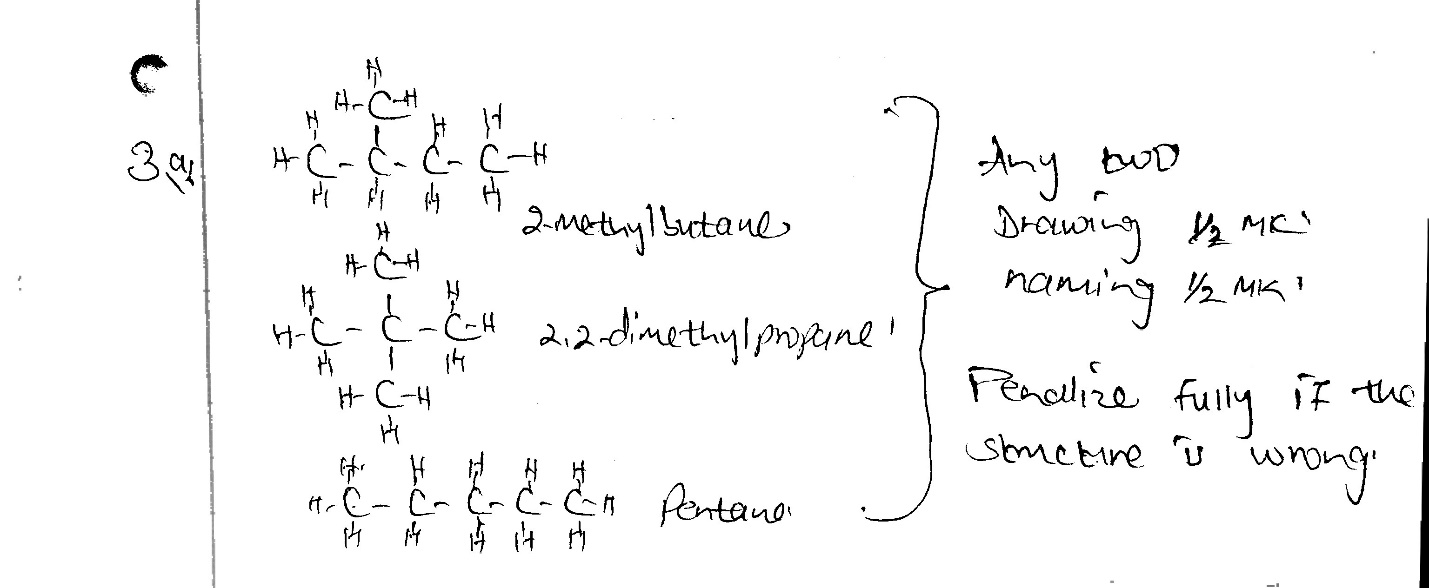
e) Brown solid changes to black√1

Brown copper metal oxidized/ reacts with oxygen to form copper (II) oxide (black)

f) - Argon

- Neon Any one. (1mk)

- Helium

1. 

Any two

Drawing ½mk

Naming ½mk

Penalize fully if the structure is

wrong

b J- Hydrogenation√1

K –Bromination/Halogenation √1

T-Polymerisation√1

(ii) J-Hydrogen gas √ ½

K- Bromine gas √ ½

(iii) U-carbon (IV) Oxides gas √1

W – 1- chloroethane √ ½

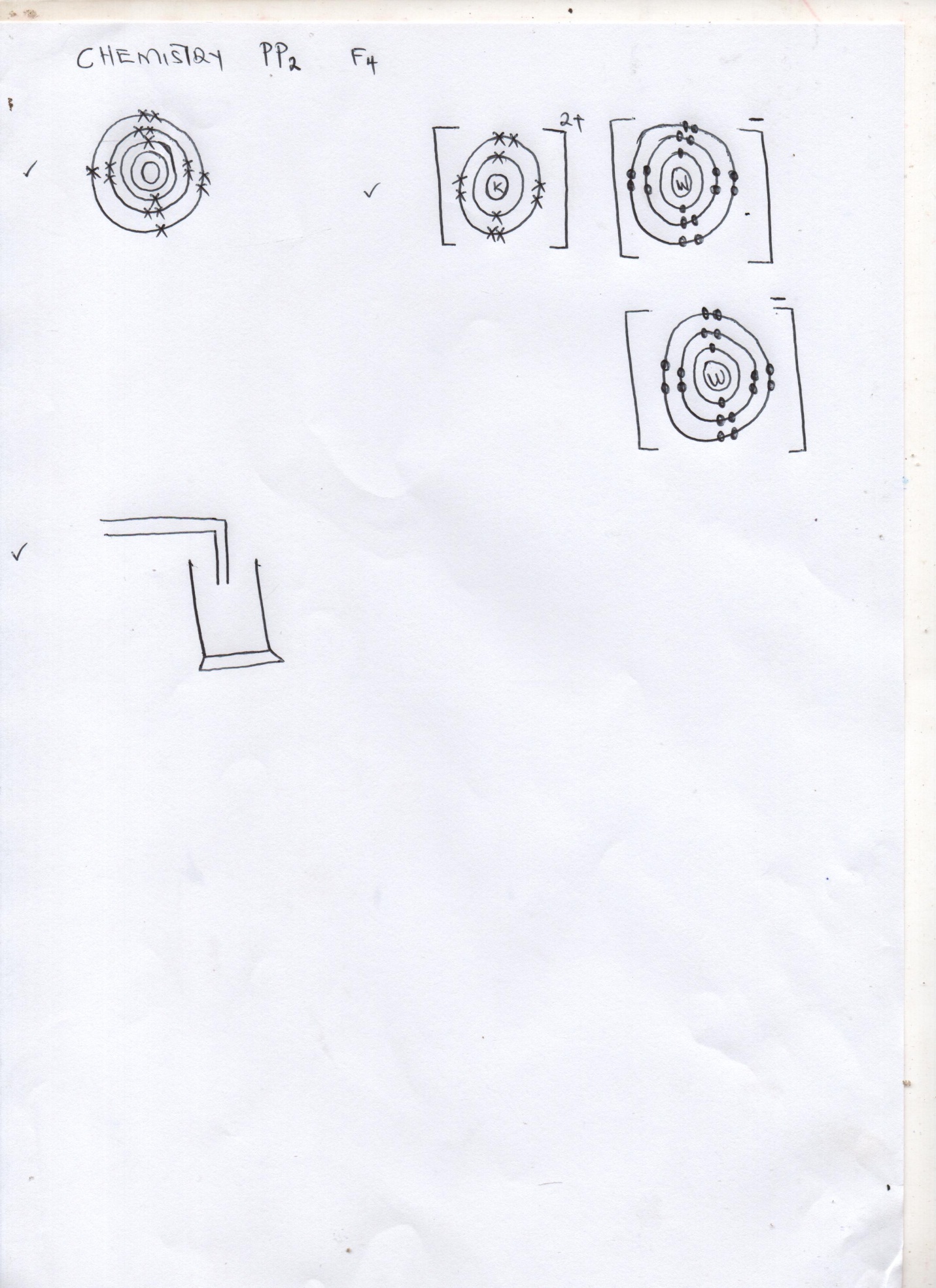
S – Polyethene√ ½

Y – Sodium propanoate√ ½

C) CH2CH2 √ 1 burns with a yellow sooty flame while CH3CH3 √1 burns with a blue non- sooty flame.

4 a) C and T (Mark tied to the two elements)

b) J – has five energy levels/ highest number of energy levels.

 c)

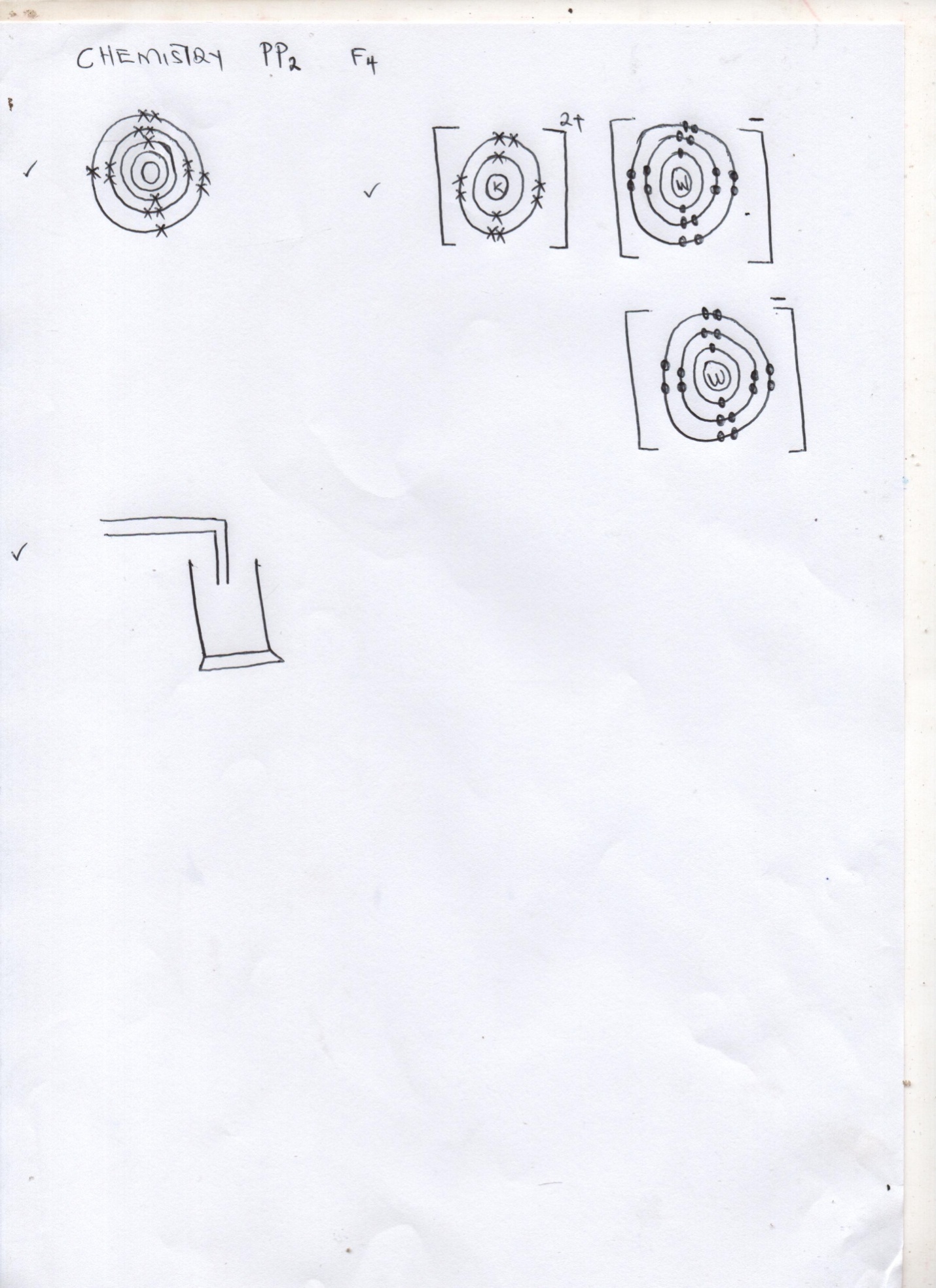
d) i) Y -2,8,8,2 √ 1

w – 2,8,7√1

e) Period 3 should be shown on the grid

Group 5 otherwise penalize fully

f) M √

 g) K W2

h. K has a smaller √ ½ atomic radius than X

K has more √ ½ protons in the nucleus which increase the nucleus force of attraction √ ½ (higher nuclear charge) hence the electrons on the energy levels are strongly attracted towards the nucleus.

5 (i) 2 Pb (NO3)2(S)  Heat 2 PbO(s) +4 NO2 (g) + O2

* Penalize ½ mk if state symbols miss /wrong
* Penalize fully if not balanced

(ii) Sodium nitrate√ ½

Sodium nitrate √ ½

(iii) Charcoal glow red hot √1

(iv) To absorb Carbon (IV) oxide gas formed√1

(v) Carbon (II) oxide gas √1

b) i) Nitrogen gas – fractional distillation of liquid air

Hydrogen gas – Electrolysis of brines

* Cracking of hydrocarbon
* Water gas

(ii) Catalyst P platinum/ platinum – rhodium √ ½

Gas M – Nitrogen (II) Oxide √ ½

Liquid F – water √ ½

(iii) 4NH3 +5O2Platinum 4NO(g) + 6H 2O (1)

4 NO2 (g) +2H2O(l)+O2(g) 4 HNO3(aq)

iv) – Manufacture of nitrate fertilizers, synthetic fibre, dyes, drugs, explosives,

Purification of metals (Any one ½ mk).

6. (a) (i) P - PbSO4 *NOTE* penalize the name fully

(ii)Q – Na2 NO3

(b) Pb2+ (aq)  + S042- (aq) PbSO4(s)

(c) Double decompositions/ precipitation

(d) Filtration

(e) Pb(NO3)2 (aq) + 2HCl(aq)Pbcl2 (s) + 2HNO3 (aq)

f. warming

g. solubility

h. chloride

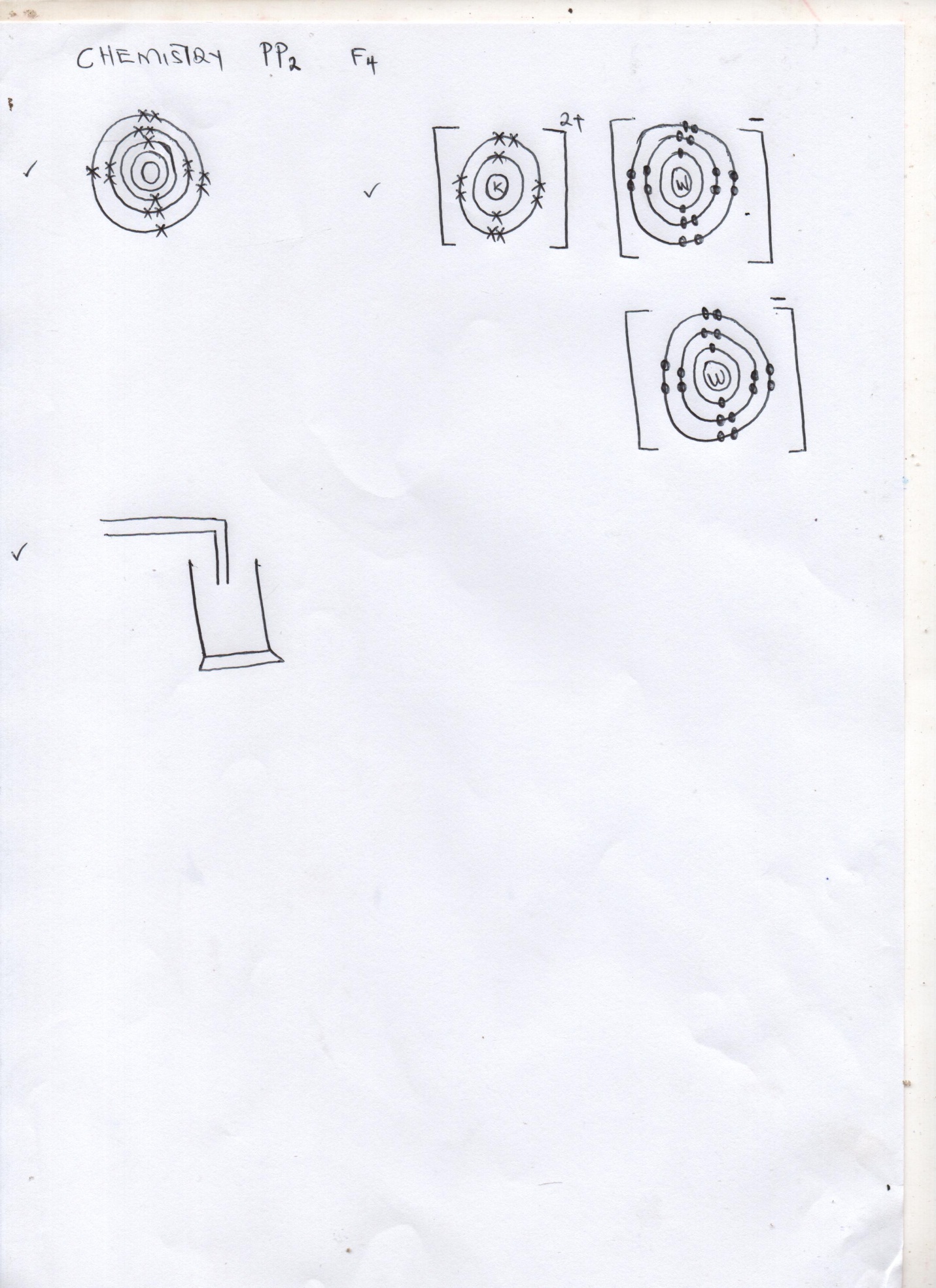
i. Pb(OH)4 2-

7. (a) (i) solid W – Sodium sulphite

(ii) Dropping funnel

(b)Drying agent

(c)



d Yellow iron (III) sulphate solution √1 turned pale green sulphur (IV) oxide gas reduced iron (III) ions to iron (II) ions√1.

e) Na2SO3(S) + 2Hcl(aq) 2 Nacl(aq)+SO2(g)  + H2O(l)

moles of Hcl

2 moles 1000 cm3

50 cm√ (1 mk)

= 0.1moles

Mole ratio Hcl : SO2

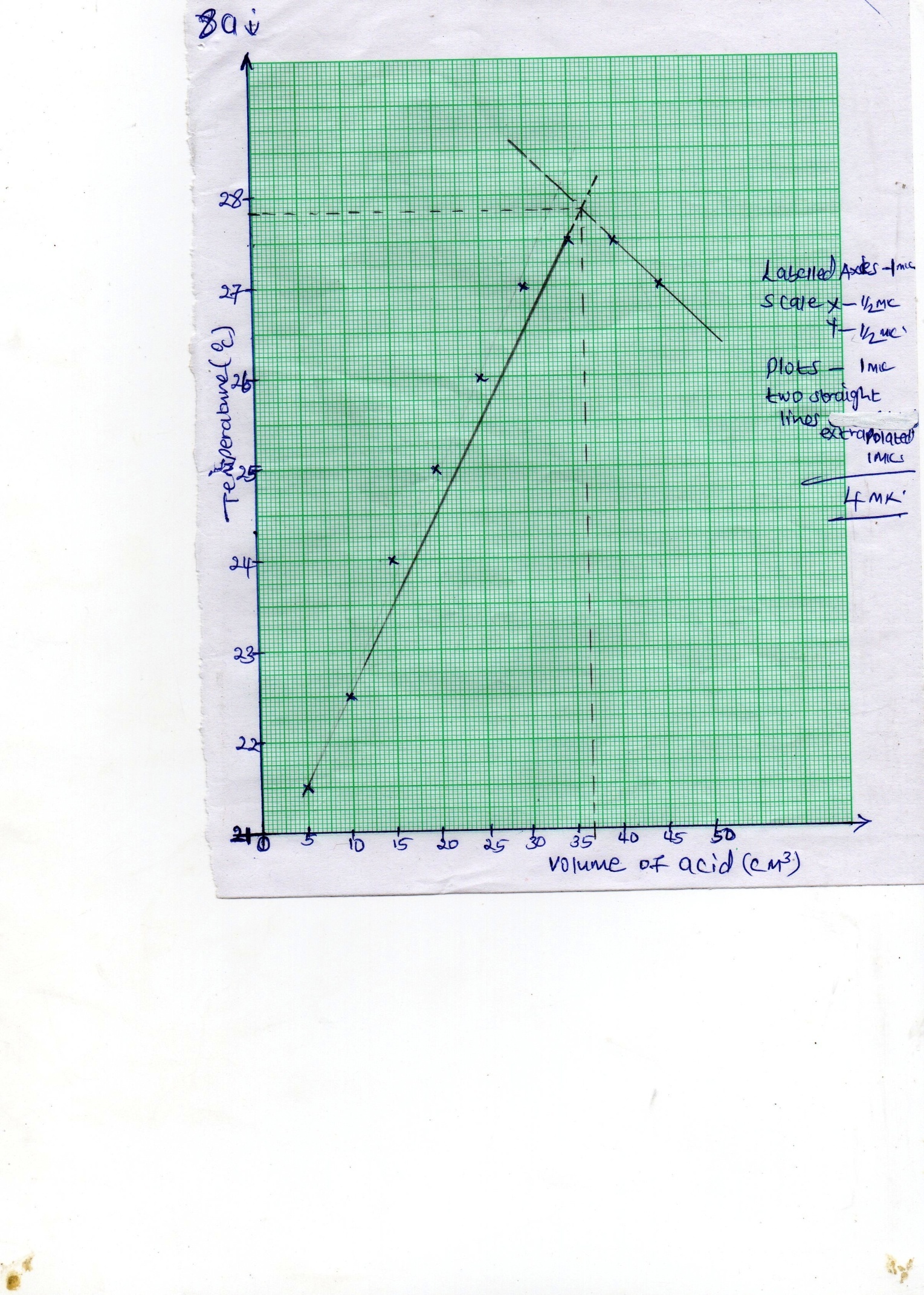
2 : 1 √ ½

Moles of SO2 = = 0.05moles

½

1Mole 24dm3= 1.2dm3√ ½

* 1. oles ?



8.

a (i)Volume (shown on the graph) =36.5 cm3√ ½

Mole ratio.

NaOH : Hcl

1. : 1

Moles of NaoH reacting

0.1 Moles 1000cm3

? 40cm3√1

= = 0.004 1 ½

Mole of Hcl 0.004 moles 36.5 cm3

? 1000cm3

= 0.1096M½

b (i) H = MCDT NOTE

40 +36.5 =76.5CM3 ½ 1. 27.8 must be shown on the graph;

MASS =76.5 1 =76.5 g otherwise deny ½ mk

2.5061 KJ √ ½

NOTE

(ii) Mole of Hcl = 0.004 moles 2. If the units are missing deny ½ mk

0.004 moles 2.5061Kj

1 Mol ? if sign is missing deny 1mk.

√ ½ = - 626.535Kjmol-1

(iii)

Heat of products and heat of reaction ½mk. Enthalpy change ½mk

=-626.535kJmol-1

Reaction path

NaCl(aq) + H2O

NaOH(aq) + Hcl(aq)

iv) NaOH(aq) + HCl(aq) NaCl(aq) + H2O(l)H = -626.536kJmol-1