

MURANG`A EAST 2021 [K.C.S.E. TRIAL EXAMINATION]

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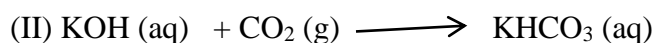
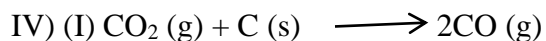
CHEMISTRY PAPER 2

MARKING SCHEME

I) To absorb excess Carbon (IV) oxide or gas B }
 To absorb unreacted Carbon (IV) oxide } any one

II) Carbon (IV) oxide / CO₂

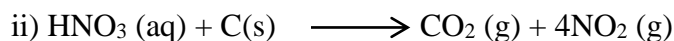
III) Any Carbonate/hydrogen Carbonate and acid



v) Use of Ca(OH)₂ (aq) : CO does not form white precipitate with Ca(OH)₂ while CO₂ does

CO burns with a blue flame while CO₂ does not support combustion.

VI (i) Brown fumes produced }
 Black substance dissolves } any one



VII) Reducing agent in the extraction of metals from the ores }
 Used as fuels } any one correct
 Manufacture of hydrocarbons }

2. a) 2.8.8, 2.8

b) i) D

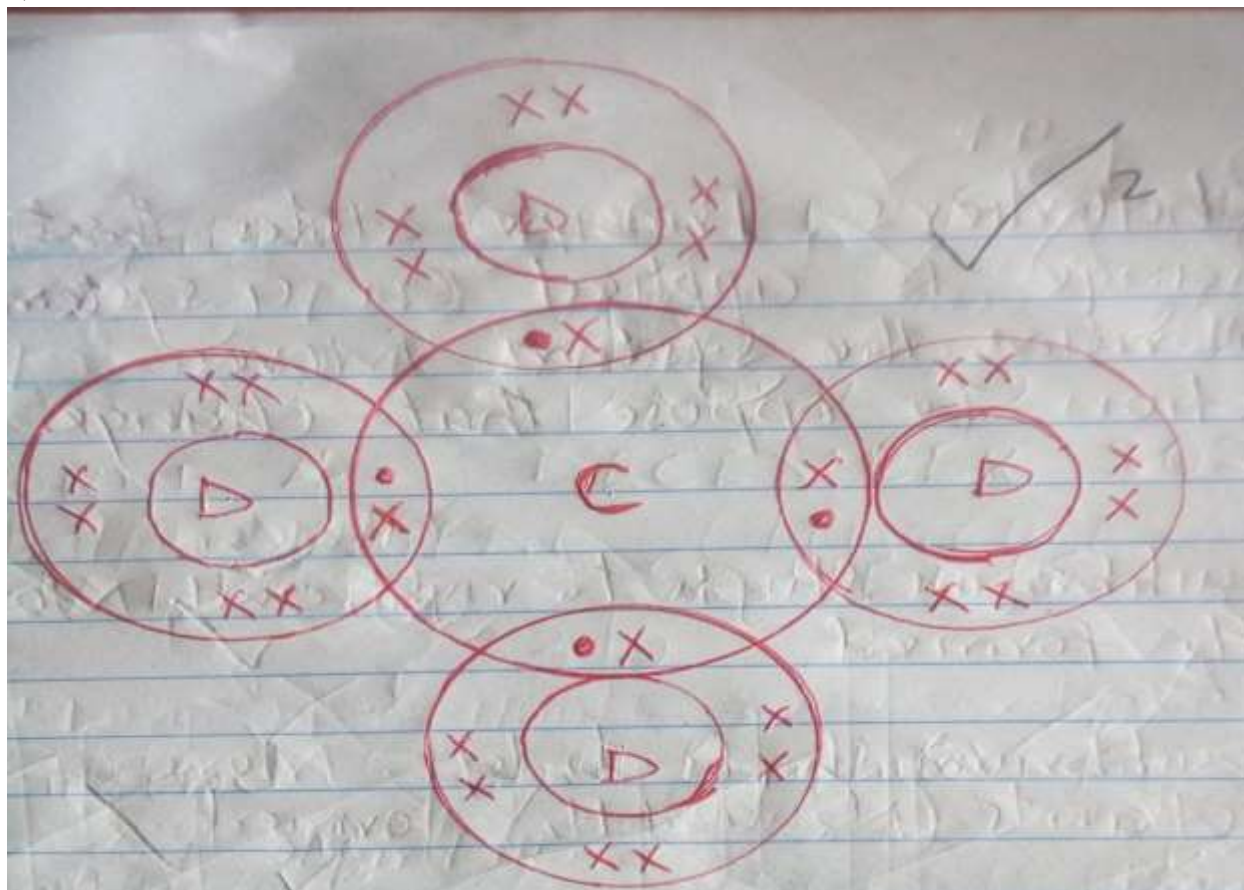
ii) A

iii) C

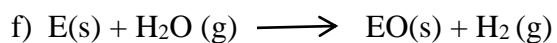
iv) Liquid The melting point is below 661⁰c

c) B is a better electric conductor than A, because it has more delocalized electrons than A.

d)



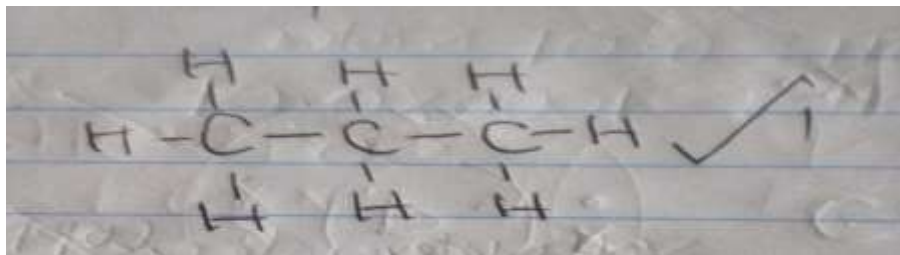
e) B has a higher melting point than A because B has more delocalized electrons than A. Therefore B has stronger metallic bond than A thus high melting point.



g. Add water to the mixture, Stir, E Chloride dissolves while Lead (II) Sulphate does not. Filter and wash the residue with distilled water.

Evaporate the filtrate to obtain solid E Chloride

3. a) Propane



b) i) Reagent – Conc Sulphuric (VI) acid/Conc H_2SO_4

Condition – $160 - 180^\circ\text{C}$

ii) Reagent: Chlorine gas / Cl_2 (g)

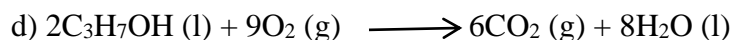
Condition: Ur light / sunlight

C (i) Carbon (IV) oxide

(ii) Hydrogen gas

(iii) Propan-1-oic acid

iv) 1-Bromopropane / 2 – Bromopropane



e) Addition polymerization / polymerization

f) $(3 \times 12) + (1 \times 6) = 42$

$$42n = 21,000$$

$$N = \frac{21,000}{42} = 500 \text{ units}$$

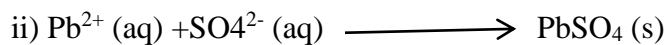
4.

i) a) Are substances which when molten or dissolved in water conduct an electric current and decomposes.

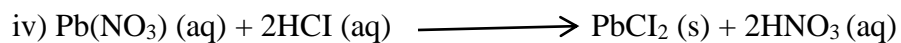
b) i) Magnesium metal conducts since it contains free ions

c) i) P – PbSO_4

Q – $\text{Mg} (\text{NO}_3)_2$



iii) Precipitation / Double decomposition



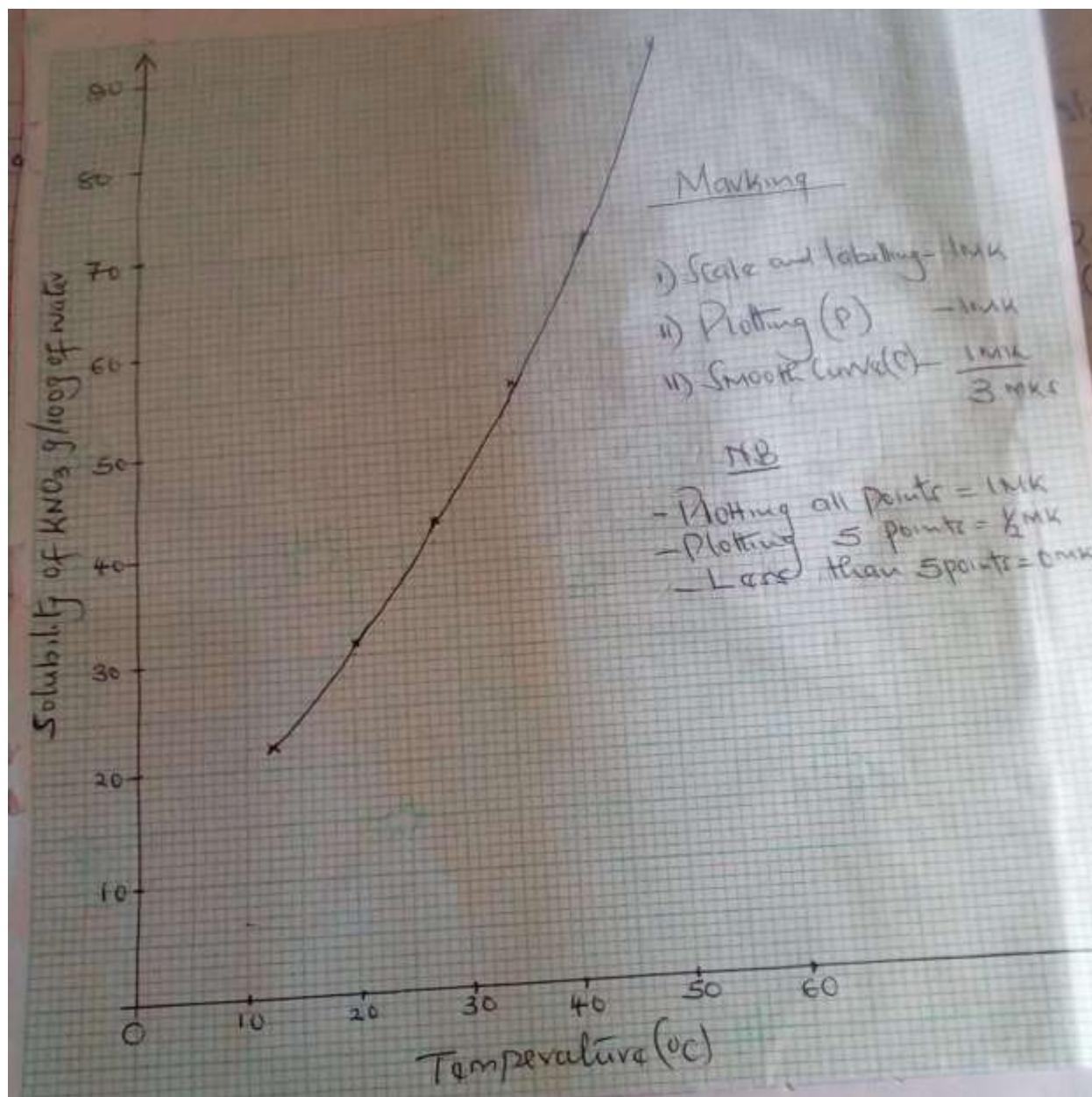
v) Heat/warm

vi) Effect of temperature on solubility

vii) It is used as anti-acid medicine because $\text{Mg} (\text{OH})_2$ is a non-toxic base.

5. a) A solution which cannot dissolve any more solute at a particular temperature.

b (i)



ii) (i) 25g per 100g of water

(ii) Mass dissolved = 62g

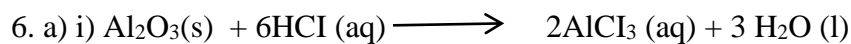
Mass of undissolved = $80 - 62 = 18g$

c) R.F.M of KNO₃ = 101

Moles of KNO₃ in 100g water = $\frac{25}{101} = 0.2475$ moles

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$$\begin{aligned} \text{Moles in 1000g of water} &= \frac{101}{100} \times 1000 \\ &= 2.475 \text{ moles} \end{aligned}$$

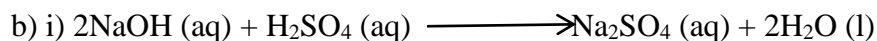


(ii) R.F.M of Al_2O_3

$$(27 \times 2) + (16 \times 3) = 102$$

$$\text{Moles of } \text{Al}_2\text{O}_3 = \frac{153}{102} = 1.5 \text{ moles}$$

$$\text{Moles of HCl} = 1.5 \times 6 = 9 \text{ moles}$$



(ii) (I) Mole ratio of NaOH: $\text{H}_2\text{SO}_4 = 2: 1$

$$\text{Moles of } \text{H}_2\text{SO}_4 \text{ reacted} = \frac{20 \times 0.25}{1000} = 0.005 \text{ moles}$$

$$\text{Moles of NaOH reacted} = 2 \times 0.005 = 0.01 \text{ moles}$$

(II) If 50cm^3 of NaOH = 0.01 moles

$$1000\text{cm}^3 \text{ of NaOH} = \frac{1000 \times 0.01}{50}$$

$$= 0.2 \text{ moles}$$

(III) Molar mass of NaOH = 40 gmol^{-1}

$$\text{Mass of NaOH reacted} = 40 \times 0.2 = 8\text{g}$$

$$\text{Mass of NaCl} = 8.8 - 8.0 = 0.8\text{g}$$

$$\% \text{ of NaCl} = \frac{0.8}{8.8} \times 100 = 9.090\%$$

7. i) Galena

ii) Some of the Sulphide is converted into Lead Oxide and Sulphur (IV) oxide

iii) Carbon (II) oxide or carbon (IV) oxide



v) To reduce unreacted Pbs to Pb

vi) Sulphur (IV) oxide – causes acid rain
Lead – causes lead poisoning

b) Hard water contains $\text{Mg}^{2+} / \text{Ca}^{2+}$ ions. These ions form a protective layer of calcium Sulphate or Magnesium Carbonate hence does not dissolve lead.
Soft water does not form these deposits.

c) Radioactive shielding
Lead acid accumulators
Making roof