

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
DIPLOMA IN SECONDARY EDUCATION EXAMINATION**

732/2B

**CHEMISTRY 2B
(ACTUAL PRACTICAL B)**

Time: 3 Hours

ANSWERS

Year: 2014

Instructions.

1. This paper consists of **three (3)** questions.
2. Answer **all** questions
3. Question number 1 carries 20 marks and the rest carry 30 marks.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **examination Number** on every page of your answer booklet(s).

maktaba.tetea.org



1. You are provided with:

N1: ethanoic acid (unknown concentration)

N2: sodium hydroxide solution, 4.0 g NaOH per dm³

Phenolphthalein indicator

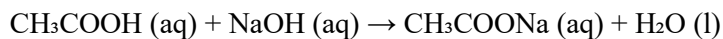
(a) The colour change observed is **pink to colourless**. Phenolphthalein is pink in basic solutions and turns colourless in acid when neutralized.

(b) Molar mass of NaOH = 23 + 16 + 1 = 40 g/mol

Concentration of NaOH = 4.0 ÷ 40 = **0.1 mol/dm³**

Moles of NaOH in 25.0 cm³ = 0.1 × 25.0 ÷ 1000 = **0.0025 mol**

(c) Balanced chemical equation:



(d) From the equation, 1 mol of ethanoic acid reacts with 1 mol of NaOH

So moles of CH₃COOH = 0.0025 mol

Volume of N1 used = 25.0 cm³ = 0.025 dm³

Concentration of N1 = 0.0025 ÷ 0.025 = **0.1 mol/dm³**

(e) Molar mass of CH₃COOH = 12 + 3(1) + 12 + 2(16) + 1 = 60 g/mol

Concentration in g/dm³ = 0.1 × 60 = **6.0 g/dm³**

(f) Phenolphthalein acts as a **pH indicator**. It shows the end point of the neutralization by changing colour.

2. You are given:

P1: potassium iodide

P2: hydrogen peroxide

P3: sulfuric acid

Starch solution

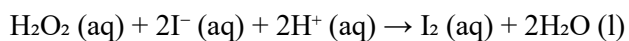
(a) The blue-black colour appears because **iodine (I₂)** is formed and reacts with starch to form a blue-black complex.

(b) Table completed:

Temperature (°C)	Temperature (K)	Time (s)
30	303	65

40	313	45
50	323	30
60	333	18
70	343	10

(c) Ionic equation:



(d) As temperature increases, reaction rate increases, so **reaction time decreases**. Higher temperature increases particle kinetic energy, leading to faster collisions.

(e) The graph of temperature (K) vs time (s) would be a **downward curve**, showing that time decreases with increasing temperature.

(f) At 20°C (293 K), reaction time would increase. This is because particles have less kinetic energy, reducing the rate of effective collisions.

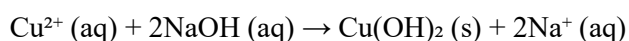
3. You are given salt X.

(i) Table of observations and inferences:

Test	Observation	Inference
Appearance	White crystalline solid	Ionic compound
Heating	Brown fumes, pungent smell	Nitrate (NO_3^-) present
Solubility	Soluble in water	Confirms ionic salt
NaOH (few drops)	Pale blue precipitate	Possible Cu^{2+}
NaOH (excess)	Precipitate remains	Confirms Cu^{2+}
Ammonia (few drops)	Light blue precipitate	Cu^{2+}
Ammonia (excess)	Deep blue solution forms	Confirms Cu^{2+}
$\text{BaCl}_2 + \text{HCl}$	No precipitate	No SO_4^{2-} or CO_3^{2-}
$\text{AgNO}_3 + \text{HNO}_3$	No precipitate	No halides

(ii) The cation is Cu^{2+} and the anion is NO_3^- , so salt X is **copper(II) nitrate ($\text{Cu}(\text{NO}_3)_2$)**.

(iii)



(iv)

