

Name:..... Centre/Index No: .....

Signature:.....School:.....

**545/3**  
**CHEMISTRY**  
**PRACTICAL**  
**Paper 3**

**2 hours**

**Uganda Certificate of Education**

**MOCK EXAMINATIONS**

**CHEMISTRY**  
**PRACTICAL**

**Paper 3**

**2 hours**

**INSTRUCTIONS TO CANDIDATES:**

*This paper consists of **two** questions. Answer **both** questions.*

*Answers are to be written in the spaces provided in this booklet.*

*You are **not** allowed to use any reference books ( i.e. text books, booklets of qualitative analysis e.t.c.)*

***All** working **must** be clearly shown.*

*Mathematical tables, slide rules and silent non-programmable scientific calculators may be used.*

For Examiner's use Only	
Question	Marks
1.	
2.	
TOTAL	

**Turn Over**

1. You are provided with the following solutions:

**BA1** which is a solution made by dissolving 10.2g of impure potassium carbonate to make 1 litre of solution.

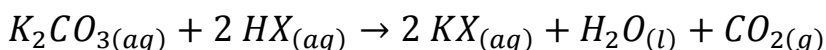
**BA2** which is 0.1M solution of a monobasic acid.

Methyl orange indicator.

You are required to determine the percentage purity of potassium carbonate

( $K = 39, C = 12, O = 16, H = 1$ )

**BA1** reacts with **BA2** according to the equation:



**Procedure:**

Pipette  $25\text{cm}^3$  (or  $20\text{cm}^3$ ) of **BA1** into a conical flask. Add 2-3 drops of methyl orange indicator and then titrate with **BA2** from a burette until the end point is reached. Repeat the titration until you obtain consistent results. Record your results in the table below:

**Results:**

Volume of pipette used: ..... $\text{cm}^3$

Titre number	1	2	3
Final burette reading ( $\text{cm}^3$ )			
Initial burette reading ( $\text{cm}^3$ )			
Volume of <b>BA2</b> used ( $\text{cm}^3$ )			

Values used to calculate the average volume of **BA2**.

..... $\text{cm}^3$

Average volume of **BA2** used..... $\text{cm}^3$

(a) Calculate the:

(i) number of moles of **BA2** reacted.

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(ii) molarity of **BA1**

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(b) Determine the:

(i) mass of potassium carbonate that reacted.

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(ii) percentage purity of potassium carbonate.

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**Turn Over**

2. You are provided with substance **P** which contains two cations and one anion.

Carryout the following tests on **P** and identify the ions in it. Record your observations and deductions in the table below. Identify any gas (es) evolved.

Tests	Observations	Deductions
(a) Heat a spatula endful of <b>P</b> in a boiling tube until there is no further change.		
(b) Dissolve two spatula endfuls of <b>P</b> in about $6\text{cm}^3$ of water. Filter and keep both filtrate and residue.		
(c) Divide the filtrate into five portions.  (i) To the first portion, add dilute sodium hydroxide solution dropwise until in excess.		

<p>(ii) To the second portion, add dilute sulphuric acid.</p>		
<p>(iii) To the third portion, add aqueous ammonia dropwise until in excess.</p>		
<p>(iv) To the fourth portion, add lead(II) nitrate solution.</p>		
<p>(v) To the fifth portion, add barium nitrate solution followed by dilute nitric acid.</p>		

**Turn Over**

<p>(d) Wash the residue with distilled water and dissolve it in dilute nitric acid. Divide the resultant solution into two parts.</p>		
<p>(i) To the first part, add dilute sodium hydroxide solution dropwise until in excess.</p>		
<p>(ii) To the second part, add aqueous ammonia dropwise until in excess.</p>		

(g) Identify the:.

(i) cations in ***P***: .....and .....

(ii) anion in ***P***: .....

**END**