**Name...........................................................................Center/Index Number................./...........**

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**545/3**

**CHEMISTRY**

**PRACTICAL**

**Paper 3**

**AUGUST, 2019**

**2 hours**

**JINJA JOINT EXAMINATIONS BOARD**

***Uganda Certificate of Education***

**MOCK EXAMINATIONS – AUGUST, 2019**

**CHEMISTRY**

**PRACTICAL**

**Paper 3**

2 hours

**INSTRUCTIONS TO CANDIDATES:**

* *Answer* ***All*** *questions.*
* *Answers are to be written in the spaces provided.*
* *You are not allowed to use any reference books.*
* *All working must be clearly shown.*
* *Mathematical tables, slide rules and non-programmable silent electronic calculators may be used.*
* *[H=1, 0=16]*

**For Examiner’s use only**

|  |  |  |
| --- | --- | --- |
| **Q1** | **Q2** | **TOTAL** |
|  |  |  |
|  |  |  |

1. You are provided with the following:

**BA1** which is a solution containing 16.5gl-1 of an impure substance **H**. [***RFM of H = 292***]

**BA2** which is a 0.1M hydrochloric acid.

*You are required to determine the percentage purity of* **H***.*

**Procedure:**

1. Pipette 25cm3 (or 20cm3) of **BA1** into a clean conical flask. Add 2 –3 drops of methyl-

Orange indicator and titrate the mixture with**BA2** from the burette.

1. Repeat the titration 2 – 3 times until you obtain consistent readings.

Enter your results in the table below.

**Results:**

Volume of pipette used…………………………………………………...... (0½ mark)

**Table** (4½ marks)

|  |  |  |  |
| --- | --- | --- | --- |
| Final burette reading (cm3) |  |  |  |
| Initial burette reading(cm3) |  |  |  |
| Volume of **BA2**used (cm3) |  |  |  |

Titre values used forcalculating average volume of **BA2** used are ….………………….…

…………..………………………… …………………………………………(0½ mark)

Average volume of **BA2**used …………………….……..………………...…(2½ marks)

**Questions:**

1. Calculate the number of moles of;
2. Hydrochloric acid that reacted. (03 marks)

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1. **H** in 1 litre of solution **BA1**.

[1 mole of **H** reacts with 2 moles of acid] (04 marks)

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1. Work out the percentage purity of H in the substance.

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1. You are provided with substance **Z** which contains **two cations** and **one anion**. You are required to identify the cations and anion in **Z.** Carry out the following tests on **Z** and record your observations and deductions in the table below**.** Where gas(es) is (are) evolved, it must be identified. ***(30 marks)***

|  |  |  |
| --- | --- | --- |
| ***TESTS*** | ***OBSERVATIONS*** | ***DEDUCTIONS*** |
| **(a)**Heat two spatula end-fuls of **Z** in  a dry test tube first gently and then  strongly until there is no further  change. |  |  |
| **(b**) To two spatula end-fuls of **Z** in a  boiling tube, add about 3cm3of  water and shake vigorously |  |  |
| (**c**) To the mixture from (**b**), add dilute  ammonia solution drop-wise until  in excess.  **Filter and keep both the filtrate**  **and the residue.** |  |  |
| (**d**) To the filtrate from (**c**), add dilute  nitric acid drop-wise until it is just  acidic.  **Divide the acidified filtrate into**  **four portions**. |  |  |
| 1. To the **first** portion of the acidified filtrate, add dilute sodium hydroxide solution drop-wise until in excess. |  |  |
| 1. To the **second** portion of the acidified filtrate, add dilute ammonia solution drop-wise until in excess. |  |  |
| 1. To the **third** portion of the acidified filtrate, add 3 – 4 drops of lead (II) nitrate solution and heat. |  |  |
| 1. To the **fourth** portion of the acidified filtrate, carry out a test of your own choice to confirm the anion in **Z**.   ***Test*** |  |  |
| (e) Wash the residue from **(c)** and then  add to it dilute sulphuric acid to it  until there is no further change.  **Divide the acidic solution into**  **three parts**. |  |  |
| 1. To the **first** part of the acidic solution, add dilute solution of sodium hydroxide drop-wise until in excess. |  |  |
| 1. To the **second** part of the acidic solution, add 3 – 4 drops of potassium iodide solution |  |  |
| 1. To the **third** part of the acidic solution, add dilute ammonia solution drop-wise until in excess. |  |  |

(f) Identify the;

1. cations in **Z**...….…………………………and ………….……….……………………
2. anion in **Z**..……………………………. …… ………...………………………………