**Name ....................................................................................................... ADM. .....................................**

 FORM 3 CLASS ................................................

**CHEMISTRY**

Paper 3 Date ......................................

**Time : 2¼ Hours**

**CHEMISTRY**

Paper 3

**Time : 2¼ Hours**

**INSTRUCTIONS TO CANDIDATES**

* Answer all questions on the space provided
* All working **Must** be clearly shown

**For Examiner’s Use Only**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum score** | **Candidate's score** |
| 1 | 17 |  |
| 2 | 13 |  |
| **Total score** | **30** |  |

1. You are provided with;
* Solution A 0.2MNaOH
* Solution B Hydrochloric acid
* Solution C sodium Carbonate solution

You are required to standardize hydrochloric acid using solution A and hence determine the morality in moles per liter of solution C sodium carbonate

**Procedure I**

 Using a pipette transfer 25cm3 solution A into conical flask add 2 to 3 drops phenolphthalein indicator then titrate with hydrochloric acid provided in a beaker from burette. Shake the conical flask after each additional and note the volume required to neutralize sodium hydroxide solution. Record your results in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Titre | I | II | III |
| Final burette readings (cm3) |  |  |  |
| Initial burette readings (cm3) |  |  |  |
| Volume of the acid used (cm3) |  |  |  |

1. What is the average volume of solution B? (5mks)
2. Calculate the number of moles of solution B required to complete neutralize solution A. (3mks)
3. Calculate the molarity in moles per liter of solution B hydrochloric acid. (1mk)

**Procedure II**

Rinse the pipette thoroughly then pipette 25cm3 of solution C sodium carbonate into clean conical flask then add 2 to 3 drops of phenolphthalein indicator. Refill the burette with solution B and use it to titrate content of the conical flask. Shake the flask after each addition of the acid solution B and note the volume of the acid required to neutralize 25cm3 of sodium carbonate solution C.

Record your results in table below

|  |  |  |  |
| --- | --- | --- | --- |
| Titre |  |  |  |
| Final burette readings (cm3) |  |  |  |
| Initial burette readings  |  |  |  |
| Volume of solution B used  |  |  |  |

1. Calculate average volume of solution B used. (5mks)
2. Calculate the number of moles of solution C in 25cm3 of the solution. (2mks)
3. Calculate the molarity of solution C in Mole per liter. (1mk)
4. You are provided with solid D. Carry out tests below and record your observation and inferences in the table below.
5. Describe the appearance of sold D. (2mks)
6. Take a boiling tube, add all solid D and add about 10cm3 of distilled water. Shake the mixture

|  |  |
| --- | --- |
| Observations | Inference |
|  (1mk) | (1mk) |

1. Divide the solution obtained above into five portions. To the first portion add drops of lead (ii) Nitrate solution.

|  |  |
| --- | --- |
| Observations | Inference |
|  (1mk) | (2mk) |

1. To the second portion add 3 drops of barium Nitrate.

|  |  |
| --- | --- |
| Observations | Inference |
| (1mk) | (1mk) |

1. To the third portion add few then excess drops of ammonia solution.

|  |  |
| --- | --- |
| Observations | Inference |
|  (1mk) |  (2mk) |

1. To the fifth portion, add drops of hydrochloric acid then boil the mixture.

|  |  |
| --- | --- |
| Observations | Inference |
|  (2mk) |  (1mk) |

1. Give the formula of the anion acid cation present in substance D.

Cation…………………………………… (1mk)

 Anion ……………………………………. (1mk)