**UGANDA ADVANCED CERTIFICATE OF EDUCATION**

**RESOURCEFUL MOCK EXAMINATIONS 2017**

**S.6 CHEMISTRY PRACTICAL**

**PAPER 3**

**TIME: 3 HRS 15 MINUTES.**

**INSTRUCTIONS**

**Answer all questions.**

1. You are provided with the following

BA1 which is potassium permanganate (VII) solution of unknown concentration.

BA2 which is a 0.05M solution of diammoniun iron (II) sulphate -6- water solid x which is an ethanediote (oxalate) with formula Y2(COO)2.

You are required to standardize BA1 and use it to determine the relative atomic mass of Y.

In acidic medium, manganite (vii) ions oxidise iron (II) to iron (III) and ethanedioate ions (C2O42-) ions to carbon dioxide.

The manganate(VII) ions are reduced to Manganese (II) ions and water.

**Procedure A**

Weigh accurately about 1.0g of X and dissolve it in about 100cm3 of water in a 250cm3 volumetric flask. Make the solution to the mark by adding distilled water. Label this solution BA3.

Results

Mass of weighing container + X = ……………………………………………………..

Mass of Weighing container = ………………………………………………………..

Mass of X used = ……………………………………………………….

**Procedure B**

Pipette 25.0cm3 (or 20cm3) of BA2 into a conical flask and add an equal Volume of 2M sulphuric acid. Titrate the mixture with BA1

Repeat the titration to obtain constant results.

Record your results in table I

Volume of pipette used = …………………………………………..cm**3**

**Table I**

|  |  |  |  |
| --- | --- | --- | --- |
| Final burette reading/cm3 |  |  |  |
| Initial burette reading /cm3 |  |  |  |
| Volume of BA1 used /cm3 |  |  |  |

Titre values used for calculating average volume of BA1 use………………………

……………………………………………………………………………………………..

Average volume of BA1 used

……………………………………………………………………………………………..

……………………………………………………………………………………………..

**Procedure C**

Pipette 25.0cm3 (or 20cm3) of BA3 into a conical flask and add an equal volume of 2M sulphuric acid. Warm the mixture to about 60oc and titrate the warm solution with BA1.

Repeat the titration until you obtain consistent results.

Record your results in table II Results:

Results:

Volume of pipette used = …………………………………….cm3

**Table II**

|  |  |  |  |
| --- | --- | --- | --- |
| Final burette reading/cm3 |  |  |  |
| Initial burette reading /cm3 |  |  |  |
| Volume of BA1 used /cm3 |  |  |  |

Titre values used for calculating average volume of BA1 used ……………………..

…………………………………………………………………………………

Average Volume of BA1 used

…………………………………………………………………………………………………………………………………………………………………………………………………….

Procedure C:

Pipette 25.0cm3 (or 20cm3) of BA3 into a conical flask and add an equal volume of 2M sulphuric acid. Warm the mixture to about 60oc and titrate the warm solution with BA1.

Repeat the titration until you obtain consistant results.

Record your results in table II

Results:

Volumeof pipette used = ………………………………………..cm3

**Table II**

|  |  |  |  |
| --- | --- | --- | --- |
| Final burette reading/cm3 |  |  |  |
| Initial burette reading /cm3 |  |  |  |
| Volume of BA1 used /cm3 |  |  |  |

Titre Values used for calculating average volume of BA1 used………………………

………………………………………………………………………………………………….Average volume of BA1 used……………………………………………………………..

…………………………………………………………………………………………………

Questions

1. Write the Over all ionic equatin for the reaction Between manganite (VII) ions and

(i)Iron (II) ions

………………………………………………………………………………………………………………………………………………………………………………………………

Oxalate ions

………………………………………………………………………………………………………………………………………………………………………………………………

1. Determine the:
2. number of moles of manganate (VII) ions that reacted with iron (II) ions.

………………………………………………………………………………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………………………………………………………………………………

1. molar concentration of BA1

………………………………………………………………………………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………………………………………………………………………………

1. Calculate the;
2. Concentration of oxalate ions in BA3 in moles per dm3.

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………………………………………………………………………………………………………………………………………………………………………………………………

1. molar mass of X

………………………………………………………………………………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………………………………………………………………………………

1. relative atomic mass of Y (C=12, =16)

………………………………………………………………………………………………………………………………………………………………………………………………

………………………………………………………………………………………………………………………………………………………………………………………………

You are provided with substance T which contains two cations and two anions. You are required to carry out the following tests on T and to identify the anions and cations in T. Record your observations and deductions in the table below.

|  |  |  |
| --- | --- | --- |
| **TESTS** | **OBSERVATIONS** | **DEDUCTIONS** |
| 1. Heat a spatula end ful of T in a dry test tube |  |  |
| 1. To a spatula end ful of T in a dry test tube, add 5 drops of Conc. H2SO4 and warm. |  |  |
| 1. Shake a spatula endful of T with about 5cm3 of water to make a solution. 2. Use 1cm3 of the solution of T to carry out a test of your own choice to confirm one of the anions in T.   ……………………...............................  ……………………………………………  ……………………………………………..  ……………………………………………..  ……………………………………………..  ……………………………………………. |  |  |
| 1. To the remaining solution of T add dilute NaOH solution drop wise until there is no further change. Filter and keep both the filtrate and residue. |  |  |
| 1. Add dilute hydrochloric aciddropwise to the filtrate until the solution is just acidic. Divide the solution into four portions.   (i)To the first portion of the filtrate, add dilute sodium hydroxide solution drowise until in excess. |  |  |
| (ii) To the second portion of the acidified filtrate, add potassium iodide solution. |  |  |
| 1. To the third portion of the acidified filtrate add 5 drops of litmus solution followed by dilute ammonia solution drop wise until in excess. |  |  |
| 1. To the fourth portion of the acidified filtrate, add 5 drops of barium nitrate solution. |  |  |
| 1. Wash the residue with water and dissolve in dilute hydrochloric acid.   Divide the acidic solution into three parts. |  |  |
| 1. To the first part, add sodium hydroxide solution drop wise until in excess. |  |  |
| 1. To the second part, add dilute ammonia solution drop wise until in excess. |  |  |
| 1. Use the third part of the acidic solution to carry out a test of your own to confirm one of the cations in W |  |  |

1. (i) The cations in T are………………………………………………………………………
2. The anions in T are …………………………………………………………………

3. You are provided with an organic compound Q. You are required to identify the nature substance Q. Carry out the following tests on Q and record your observations and deductions in the table below.

|  |  |  |
| --- | --- | --- |
| **TESTS** | **OBSERVATIONS** | **DEDUCTION** |
| 1. Burn a spatula endful of Q in a porcelain dish or at the end of a spatula. |  |  |
| 1. Shake about 2cm3 of Q with about 5cm3 of water. Warm and test with litmus. |  |  |
| 1. Dissolve about 3cm3 of Q in about 5cm3 of methanol and devide the solution into five parts. 2. To the first part of the   Solution add 2-3 drops of  iron (III) chloride  solution. |  |  |
| 1. To the second pest add 2-3 drops of Brady’s reagent. |  |  |
| 1. To the third part add about 1cm3 of Fehlings solution and boil. |  |  |
| 1. To the forth part add 2-3 drops of sodium hydrogen sulphute. |  |  |
| 1. To the fifth part of the solution add about 1cm3 if iodine solution, followed by drop-wise addition of sodium hydroxide solution until the solution is pale yellow and warm |  |  |

Comment on the nature of Q

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**END**