## KERUGOYA BOYS’ HIGH SCHOOL.

## FORM THREE CHEMISTRY PRACTICAL END OF YEAR EXAM 2015.

## 2 HRS.

NAME: ............................................. CLS: ................................... ADM: .............................................

1. You are provided with:-

* 0.08M sodium hydroxide, solution A
* H2C2O4.XH2O acid, solution B containing 15.75 grams in 250cm3 of solution.
* 0.5g of solid anhydrous sodium carbonate, solid D.

**You are required to:**

1. Prepare a dilute solution of the acid solution C.
2. Determine:-
3. The concentration of solution B in moles per litre.
4. The number of moles of water of crystallization, X

**Procedure:**

* Using a 25ml measuring cylinder, measure 50cm3 of the acid, solution B and place it in a 250 ml beaker.
* Add all the solid D at once to the acid in the beaker and stir with a glass rod until effervescence stops.
* Transfer the contents of the beaker carefully into a 250ml volumetric flask.
* Add distilled water with shaking and top up to the mark.
* Label this solution as solution C.
* Fill a burette with solution A.
* Using a clean pipette and a pipette filler, place 25cm3 of solution C into a 250ml conical flask.
* Add three drops of phenolphthalein indicator and titrate using solution A.
* Record your results in the table below
* Repeat the titration two or more times to obtain consistent results
* Volume of pipette used = ...................................... cm3

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1 | 2 | 3 |
| Final burette reading (cm3) |  |  |  |
| Initial burette reading (cm3) |  |  |  |
| Volume of base, solution A used (cm3) |  |  |  |

(4 marks)

1. Calculate the:-

* Average volume of solution A used (2 marks)
* Number of moles of sodium hydroxide solution A in the average volume used (2marks)

1. Given the equation for the reaction:

­H­2­C2­O­4­.XH­2­O­(aq)  + 2N­­aOH­(aq) ­🡪 Na­2C­­2O­4(aq) ­+ 2H­2­O­(L) ­+ XH­2­O­(L)

­Determine the:-

1. Number of moles of the acid present in 25cm3 of solution C. (2 marks)
2. Number of moles of acid present in 250cm3 of solution C. (2 marks)
3. Calculate the:-
4. Number of moles of sodium carbonate that reacted

(Na=23, C=12, O=16, H=1) (2 marks)

1. Number of moles of acid B that reacted with the carbonate (Reacting ratio of acid : carbonate is 1:1)
2. Concentration of the original acid, solution B (2 marks)
3. Determine the:-
4. Molar mass of the acid (3 marks)
5. Value of X in the acid, H­2­C­2­O­4­.XH­2­0 (3 marks)
6. You are provided with solid F. Carry out the tests below and record your observation and inferences in the spaces provided
7. Heat about half of solid F in a dry test tube, test any gas produced

|  |  |
| --- | --- |
| Observation(3 marks) | Inference (2 marks) |
|  |  |
|  | |

b. i) place the remaining solid F in a boiling tube and add about 8cm3 of distilled water. Divide the resulting solution into four portions

|  |  |
| --- | --- |
| Observation(1 mark) | Inference (1 mark) |
|  |  |

ii) To the first portion add sodium hydroxide solution drop wise until in excess

|  |  |
| --- | --- |
| Observation (2 marks) | Inference (1 mark) |
|  |  |

iii) To the second portion add three drops of lead (ii) nitrate solution

|  |  |
| --- | --- |
| Observation (1 mark) | Inference (1 mark) |
|  |  |

iv) To the third portion add 3 drops of barium chloride solution followed by dilute hydrochloric acid

|  |  |
| --- | --- |
| Observation (1 mark) | Inference |
|  |  |

v) to the fourth portion add 3 drops of hydrogen peroxide

|  |  |
| --- | --- |
| Observation (1 mark) | Inference (1 mark) |
|  |  |