**TRIAL ONE EVALUATION TEST**

**CHEMISTRY PAPER 3 (PRACTICAL)**

**233/3**

**NAME ................................................................................ INDEX NO............................**

**SIGN .................................. DATE .....................**

**TIME 2 ¼ HOURS.**

**Instruction**

* **Answer all questions in the spaces provided in the question paper.**
* **You are not allowed to start working with the apparatus for the first 15 minutes of the 2 ¼ hours allowed for this paper.**
* **All working must be clearly shown where necessary.**
* **Mathematical table and silent calculators can be used.**

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| --- | --- | --- |
| **Question**  | **Maximum score**  | **Students’ score** |
| **1** | **20** |  |
| **2** | **10** |  |
| **3** | **10** |  |
| **Total**  | **40** |  |

1. You are provided with;
* Alkaline solution labeled B.
* 1.0 M hydrochloric acid labeled A.
* Dilute dibasic acid labeled Q.

You are required to standardize B with A and obtain molar heat of neutralization of B using dilute dibasic acid.

**PROCEDURE I**

1. Place solution A in a clean 50cm3 burette.
2. Using 25ml pipette, place 25cm3 of solution B in a conical flask.
3. Add 2 drops of phenolphthalein indicator and titrate with solution A.
4. Record your results in table I repeat two times and complete the table.

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| --- | --- | --- | --- |
|  | I | II | III |
| Final burette  |  |  |  |
| Initial burette reading cm3 |  |  |  |
| Volume of solution A used cm3 |  |  |  |

 (4mks)

Calculate the;

1. Average volume of solution A used. (1mk)

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1. Moles of A that reacted with 25 cm3 of solution B. (1mk)

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1. Moles of solution B that reacted with 25cm3 of solution A given that the cation of alkaline solution has a charge + 1. (2mk)

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1. Concentration of B in moles per litre. (1mk)

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**PROCEDURE II**

1. Using a measuring cylinder, measure 50 cm3 of solution B in a 250mls plastic beaker.
2. Measure the temperature of B and record in table II below.
3. Using a measuring cylinder, measure 10cm3 of Q and add into the plastic containing 50 cm3 of solution B. stir the mixture using a thermometer and record the highest temperature in the table II below.
4. Repeat this procedure by adding 10cm3 of solution Q for five times while recording the highest temperature formed. Complete table II below.

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| --- | --- | --- | --- | --- | --- | --- |
| **Total volume of solution Q in cm3** | **0** | **10** | **20** | **30** | **40** | **50** |
| **Volume of solution B in cm3** | **50** | **50** | **50** | **50** | **50** | **50** |
| **Highest temperature change** |  |  |  |  |  |  |

 (4mks)

1. On the grid provided plot a graph of temperature (y-axis) against volume of solution Q ( x- axis. (3mks)
2. From the graph. Find;
3. Volume of the solution Q required to neutralize 50 cm 3 of solution B. (1mk)

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1. Highest temperature change. (1mk)

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1. Determine the molar heat of neutralization of solution B. (Density = 1g/cm3, specific heat capacity = 4.2 kj/kg/k. molar mass of B = x grams ) (2mks)

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1. You are provided with solid Z carry out the test below and record your observation and inferences in the spaces provided.
2. Place about a third of solid Y in a dry test-tube and heat strongly.

**Observations (1mk)**

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**Inference (1mk)**

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1. Put a spatulaful of Z in a boiling tube. Dissolve with distilled water and divide into four portions.

**Observations** ( ½ mk)

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**Inferences ( ½ mk)**

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1. To the first portion add sodium hydroxide droo wise until excess.

**Observation. ( ½ mk)**

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**Inference. ( ½ mk)**

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1. To the second portion add ammonia solution drop wise until excess.

 **Observation ( ½ mk)**

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 **Inference ( ½ mk)**

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1. To the third portion is suspected to contain Lead II ions. Give the test and observation that are to be made to confirm presence of Lead II ions.

**Test (1mk)**

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**Inference (1mk)**

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1. Carry out the test above to confirm the presence of Lead II ions.

**Test (1mk)**

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**Inference (1mk)**

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1. To the fourth portion add few drops of Barium Nitrate solution.

**Observation ( ½ mk)**

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**Inference ( ½ mk)**

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1. You are provided with slid S. Carry out the tests below and write your observations and inferences.
2. Using a clean metallic spatula. Heat solid P in a non luminous flame.

**Observation ( ½ mk)**

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**Inference ( ½ mk)**

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1. Dissolve remaining solid S in 10cm3 of distilled water in a boiling tube. Pour solution in four portions.

**Observation (1mk)**

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**Inference (1mk)**

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1. To the first portion and 3 drops of acidified Potassium permanganate.

**Observation ( ½ mk)**

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**Inference ( ½ mk)**

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1. To the second portion add a few drops of solution S and few drops of solution x. warm the solution.

**Observation (1mk)**

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**Inference (1mk)**

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1. To the third portion add spatula full of sodium carbonate provided.

**Observation (1mk)**

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**Inference (1mk)**

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1. **To the fourth portion, determine the PH of the solution using universal indicator paper.**

**Observation (1mk)**

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**Inferences. (1mk)**