**233/3**

**CHEMISTY PAPER 3**

**PRACTICAL**

**FORM 4**

***MURANGA EAST 2021***

***KENYA CERTIFICATE OF SECONDARY EDUCATION (KCSE)***

**Marking Scheme**

|  |  |  |  |
| --- | --- | --- | --- |
|  | I | II | III |
| Final reading | 12.5 | 25.0 | 12.5 |
| Initial reading | 0.2 | 12.5 | 0.0 |
| Volume used (cm3) | 12.5 | 12.5 | 12.5 |

 Marks distributed as follows:

1. Complete table (1mk)

3 titration done (1 mk)

Incomplete table with 2 titration (½ mk)

Incomplete table with one titration done (0 mk)

* **Penalties**
* Wrong arithmetic
* Inverted table
* Unrealistic title values (unless explained)

Penalize ( ½ mk) for each to a miximum of (½ mk)

1. Decimal place (1mk)
* Accept only 1 or 2 d.p used consistently, otherwise penalize fully.
* Accept inconsistency in the use of zeros as initial burette reading e.g. 0.0, 0.00 or 0.000.

**NB** decimal place tied to 1st and 2nd rows only.

1. Accuracy (1 mk)
* Compare candidate’s title value with school value S.V. if one value within $\pm $ 0.1 of S.V (1mk)

No value within $\pm $ 0.1 of S.V butat least 1 value within $\pm $ 0.2 or S.V (0 mk)

1. Averaging (1 mk)

Values averaged must be sown

If 3 consistent titrations done and averaged = (1 mk)

If 3 titration done, but only 2 are consistent and averaged = (1 mk)

If only 2 titrations done, are consistent and averaged = (1 mk)

Otherwise penalize fully

**CALCULATIONS**

1. $\frac{12.5+12.5+12.5}{3}\left(\frac{1}{2}mk\right)=12.5cm^{3} \left(\frac{1}{2}mk\right)$
2. (i) Moles in 250cm3 = $\frac{0.5}{40}=0.0125 moles (\frac{1}{2}mk)$

 Moles used =

 $\frac{0.0125 ×25}{250} \left(\frac{1}{2}Mk\right)=0.00125 moles$

(ii) Moles of acid reacting = $0.00125\left(\frac{1}{2}mk\right) $mole ratio 1:1

 250 ?

$$\frac{0.0125 ×25}{250} \left(\frac{1}{2} mk\right)=moles (\frac{1}{2} mk)$$

(iii) Molarity of solution A

 10cm3 = 0.25 moles

 1000 =?

$$\frac{ 1000 ×0.25}{10}\left(\frac{1}{2}mk\right)=25 moles\left(\frac{1}{2}Mk\right)$$

**PROCEDURE II**

**TABLEII**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Volume of solution A(cm3) | volume of distilled water | Concentration of solution A(moles/1) | Time(s) | $$\frac{I}{t}\left(s^{-1}\right)$$ |
| 12 | 0 | 2.5 | 25.5 | 0.0363 |
| 10 | 2 | 2.08 | 34.25 | 0.0292 |
| 8 | 4 | 1.67 | 45.45 | 0.0220 |
| 6 | 6 | 1.25 | 69.44 | 0.0144 |
| 4 | 8 | 0.83 | 120.01 | 0.0083 |

Complete table (4mks)

Decimal places (tied to 3rd and 5th column) (1mk)

Accuracy (tied to row (i) to (iv) (1mk)

Trend (gradual increase in time) (1 mk)

**Questions**

1. (i) read from graph (1mk)

Value of $\frac{I}{t}$ (1mk)

Correct answer (½ Mk)

|  |  |  |
| --- | --- | --- |
|  | **Observation**  | **inference** |
| 2. (a) | * Colourless liquid condenses at coller parts of test tube
* Gas evolved turns red litmus blue
* A white residue remain

Any 2 (1mk) | * Hydrated salt
* NH+4 ions

 Any 2 correct ions award (1 mk) |
| (b) i) | * Solid dissolves (½ mk) to form a colourless

solution ( ½ mk) | Mg2+AI3+,Zn2+ Present Any OneOr Cu2+, Fe2+, Fe3+ absent ( ½ mk) |
| (ii) | white precipitate is formed ( ½ mk) | CO2-3,SO-24.Cl-,SO2-3 present Any two ions award ( ½ mk)Penalize the ( ½ mk) for any contradictory ion. |
| (iii) | A white precipitate form ( ½ mk) | SO2-4 ions confirmed ( ½ mk) |
| (iv ) | White precipitate ( ½ mk) dissolves in excess to form a colourless solution ( ½ mk) | Zn2+, Pb2+ or AI3+Any 3 ions – (1mk)2 ions ( ½ mk)0 mk for any only one ion |
| (v)  | White precipitate ( ½ mk) in excess | Pb2+, AI3+ present Both ions (1mk)One ion ( ½ mk) |
| (vi) | No white precipitate formed (1 mk) | Pb2+ absent or AI3+ present (½ mk) |

|  |  |  |
| --- | --- | --- |
|  | **Observation** | **inference** |
| 3. (a) | Dissolves form (½mk) a colourless homogenous solution (½ mk) | Polar substance ( ½ mk) |
|  (b) (i)  | PH value 1 – 3 ( ½ mk) | Strong acid present ( ½ mk) |
|  (ii)  | Purple acidifiedKMnO4 decolorised (1 mk) | C:\Users\Ruiga Day\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\IMG_20201125_165912_507.jpgOR –OH present |
|  (iii) | Bromine water decolourised (1 mk) | OR –Oh. Present All three (1mk)Two only (½ mk) |
|  (iv) | Effervescence ( ½ mk) | C:\Users\Ruiga Day\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\IMG_20201125_170605_519.jpgPresent |
| (v) | Sweet smelling Compound formed (1 mk) | C:\Users\Ruiga Day\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\IMG_20201125_170958_952.jpgPresent ( ½ mk) |

