***Kenya Certificate of Secondary Education***

**233/3**

**CHEMISTRY**

**PAPER 3**

**PRACTICAL**

**MARKING SCHEME**

**Question one**

**(a)**

1. Complete table √1mk

 Complete table with 3 titres √1mk

 Incomplete table with 2 titres √½ mk

 Incomplete table with 1 titre −0 mk

 *Conditions*

* *Penalize ½ mk for unrealistic values unless where explained*
* *Penalize ½ mk for any inversion of table*
* *Penalize ½ mk for any arithmetic error*

 *NB: penalize a maximum of ½ mk for any of the conditions above.*

1. Decimal √*1mk*

 *Award 1mk for 1d.p. or 2 d.p used consistently*

 *If 2d.p used, 2ndd.p. can only be “0” or “5”*

1. Accuracy √*1mk*

 *Award 1mk for any value +* 0.1 of s.v.

 *Award ½ mk for any value +* 0.2 of s.v.

 *Award 0mk (penalize fully) for any value beyond + 0.2 of s.v.*

1. Principles of averaging √*1mk*

 *Values averaged must be consistent*

 *If 3 titres but only 2 are consistent and averaged award 1mk*

 *If 3 titres done and averaged award 1mk*

 *If 3 titres done and inconsistent and averaged award 0mk*

 *If 3 titres done and all are consistent but only 2 are averaged award 0mk*

1. Final answer √*1mk*

 *Award 1mk for ans. + 0.1 of s.v.*

 *Award ½mk for ans. + 0.2 of s.v.*

 *Award 0mk ifansnot within + 0.2 of s.v.*

 *Marks awarder as follows: CT 1mk*

 *D 1mk*

 *A 1mk*

 *PA 1mk*

 *FA 1mk*

 *5mks*

(b)Average titre = t1  + t2 + t3 = (*√½ mk)Correct Ans ½ mk*

1.

(c) Moles of NAOH = M x V

 1000

 = 0.1 x 25√*1mk* = 0.0025moles √*1mk*

 1000

(d) 2 NaOH (aq) + H2C2O4 (aq)  Na2C2O4 (aq) + 2H2O (l)

 Moles ratio = 2 :1

 Therefore moles of organic acid = ½ x 0.0025 moles √*1mk*

 = 0.00125 moles √*1mk*

1. Ans (b) cm3 has 0.00125moles

1000cm3 ?

 = 0.00125 x 1000 √*1mk*

 Ans (b)

 = Correct answer √*1mk*

(f) Ans (e) moles / L has 6.3g/l

1mole ? √*1mk*

 = 6.3 x 1 √*1mk*

 Ans (e)

 *=* Correct answer √*1mk*

(g) Value of n

 Ans (f) = H2C2O4. nH2O

 Ans (f) = 2 + 24 + 64 + 18n √*1mk*

 N = ans f – 90 √*1mk*

 18

 = correct ans √*1mk*

**Question two**

|  |  |  |
| --- | --- | --- |
|  | **Observation** | **Inferences** |
|  | Yellow flame √*1mk* | Na+ ions √*1mk* |
|  | * Colourless, odourless gas produced
* Gas turns moist blue litmus paper red
* Red litmus paper remains red
* Droplets of colourless liquid on cooler parts of test tube *Any 2 x ½ = √1mk*
 | Gas acidicCO 32- , HCO3- ions Hydrated salt / water of crystallization *Any 2 correct x ½ = √1mk* |
|  | * Effervescence / bubbles
* Colourless , odourless gas produced
* Gas turns moist blue litmus paper red
* Red litmus paper remains red

*Any 4 x ½ = √2mks* | CO 32- , HCO3- ions Gas acidic*Any 2 x 1 = √2mks*  |
|  | **Observation** | **Inferences** |
| 3. (a)  | Pale green ppt√½ mk insoluble in excess √½ mk | Fe2+√*1mk* |
| (b) (i) | Pale green ppt√*½ mk*Insoluble in excess √*½ mk* | Fe2+√*1mk* |
| (ii) | * Gas with pungent . chocking smell 1mk
* Moist red litmus paper turns to blue 1mk
* Blue litmus paper remains blue *any 2 x 1 = √2mks*
 | Gas basic √*½ mk*NH4+ ions present√*½ mk* |
| C.(i) | White ppt | CO 32-, Cl-ions , SO32- |
| (ii)  | White ppt√*½ mk*Insoluble / persists √*½ mk* | Cl- ions √*1mk*Confirmed  |
| D. | White ppt√*½ mk*Insoluble √*½ mk* | SO42- ions √*1mk* |
| E. | Pale green solution turns to yellow solution √*1mk*Brown ppt insoluble in excess √*1mk* | Fe2+ oxidized to Fe3+ ions *√½ mk*Fe3+ ions confirmed √*½ mk* |