**SET 8**

CHEMISTRY

PAPER 3

MARKING SCHEME

Question 1

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

 Total marks 5mks ………………….. distributed as follows:-

1. Complete table √ 1mk

Penalize ½ mk to a maximum of ½ mk for

* + - * Inverted table
			* Wrong arithmetic
			* Burette readings beyond 50cm3 unless where explained
			* Unrealistic titre value i.e. below I cm3 or above 50cm3
1. Use of decimals √ 1mk

Either

* + - * One decimal used consistently or
			* Two decimals used consistently

 NB:

* + - * For 2 decimal places the 2nd digit after the decimal is either zero or 5 otherwise penalize fully.
1. Accuracy

Compared to any of candidates titre values if;

* + - * Any within ± 0.1 of teacher’s titre value √ 1mk
			* Any within ± 0.2 teacher’s titre value √ ½ mk
1. Averaging √ 1mk
	* + - If 3 averaged values within ± 0.2 of each other √ 1mk
			- If 2 averaged values within ± 0.2 of each other √ 1mk
			- If 3 averaged values outside ± 0.2 of each other. √ 0mk
2. Final answer √ 1mk

Compare teacher’s averaged titre value, if within

* + - * ± 0.1 of the teacher’s value √ 1mk
			* ± 0.2 of teacher’s value √ ½ mk

CALCULATIONS

1.
2. 1.05g are in 250cm3

? are in 1000cm3

= $\frac{1000 x 1.05}{250} g$ √ ½ mk

= 4.2g √ ½ mk

Molarity of solution = $\frac{4.2}{Rmm NaOH}$

= $\frac{4.2}{40} M$ √ ½ mk

= 0.105M √ ½ mk

iii) Moles of solution A used = $\frac{25 x 0.105 }{1000}$ √ ½ mk

= 0.002625 √ ½ mk

iv) NaOH(aq) + HX(aq) → NaX(aq) + H2O(l)

 Acid : Base = 1 : 1 √ ½ mk

Therefore

Moles of solution contained in average volume

 = 0.002625 √ ½ mk

v) Molarity of solution B = $\frac{1000 x 0.002625 }{Average Volume}$ √ 1 mk

 = Corr. Ans √ 1mk

**PROCEDURE II**

1. Table II …………………..5 Mks

NB: Marks distributed as per table I

**CALCULATIONS**

1.
2. Grams per litre of solution C = $\frac{5.3 x 1000}{500}g $ √ ½ mk

= 10.6g √ ½ mk

Moles per litre of solution C = $\frac{10.6}{106}$ √ ½ mk

 = 0.1 √ ½ mk

1. Moles of solution C used = $\frac{25 x 0.1 }{1000}$ √ ½ mk

= 0.0025 √ ½ mk

1. Moles of solution B = $\frac{average volume x ans \left(iv\right)Procedure 1}{1000}$ √ ½ mk

= Corr. And √ ½ mk

1. Ans d(iii) reacts with Ans d (iv)

i.e 0.0025 moles of solution C reacts with Ans d (iv)

moles of solution B

 therefore

1. mole of solution C reacts with?

= $\frac{1 x Ans d \left(iv\right)}{0.0025 }$ √ 1 mk

 = Corr. Ans √ 1mk

1. 1 mole of solution C: Ans e) moles of solution B

NB: Balance the equation below using above mole ratio.

M2CO3(aq) + HX(aq) → MX(aq) +  CO2(g) + H2O(l) √ 1mk

QUESTION 2 (17 MARKS)

|  |  |  |
| --- | --- | --- |
|  | OBSERVATIONS  |  INFERENCES |
| 1.
 | * Yellow solid when hot and white when cold √ ½ mk
* Moist blue litmus paper turns to red √ ½ mk
* Red litmus paper remains red √ ½ mk
 | * + - * Zn2+ present √ ½ mk
			* Acidic gas evolved √ ½ mk
 |
|  | Dis slightly / partially soluble in water √ 1 mk  | Soluble and insoluble salts present in D √ 1mk  |
|  | White ppt √ ½ mk solble in excess √ ½ mk  |  Zn2+  present √ 1 mk  |
|  | White ppt √ 1 mk formed. | SO42-, SO32-, CO32- or Cl-Present NB1. 4 or 3 mentioned √ ½ mk
2. 2 mentioned √ ½ mk
3. 1 mentioned √ 0mk
 |
|  | White ppt formed √ 1 mk  |  SO42- confirmed present √ 1mk  |
| 1.
 | * + - * Effervescence / bubbles √ ½ mk
			* Blue litmus paper turns red √ ½ mk
			* Red litmus paper remains red √ ½ mk
 | * + - * Acidic gas evoived √ ½
			* C032- present√ ½
 |
| f i)ff | No white ppt formed | * + - * Zn2+, Al3+ or Mg2+

Present* + 1. 3 mentioned √ 1 mk
		2. 2 mentioned √ ½ mk
		3. 1 mentioned √ 0mk
 |
|  F (ii)  | White ppt soluble √ ½ mk in excess √ ½ mk  | Zn2+  confirmed present √ ½ mk  |