233/3 CHEMISTRYMARKING SCHEME PAPER THREE

1. a) ***Table 1***

complete table -1mk
decimal point -1mk
accuracy – 1mk
principles of averaging – 1mk
final accuracy – 1mk

b) i) $H_2A_{(aq)} + 2NaOH_{(aq)} \longrightarrow Na_2A_{(aq)} + H_20_{(l)}$ √ 1mk

Note : Penalize ($^1/_2$)mk) if state symbol missing otherwise.

Penalize fully for wrong or unbalanced equation.

iii) Concentration of NaOH.

Method 1

$\frac{M_1V_1}{M_2V_2} = \frac{1}{2}$ √½

$\frac{0.01\times25}{M_2 \times \text{ans (a) above}} = \frac{1}{}$ √½

= correct ans. √ ½

(max. 3 marks)

Method 2

Moles of the acid = $\frac{0.01 \times 25}{1000}$ √$^1/_2$

=0.00025 mol. √$^1/_2$

moles of NaoH√ = 0.00025×2√$^1/_2$

= 0.0005 moles√$^1/_2$

Molarity of NaoH = $\frac{0.005 \times 1000}{\text{answer in a above}}$ √½

= Correct ans. √$^1/_2$

Max. 3marks.

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c) Temperature of solution of solid T = ±2 s.v. √ 1

Note :

Temperature to be given as a whole number or to 1 dp (0.0 or 0.5) or to 2 d.p.(.25, .50 or .75)
Otherwise penalize Fully.

Table 2

Complete table – 1mk
decimal point . – 1mk
Accuracy .- 1mk
Principles of averaging – 1mk
Final accuracy -1mk

d) values averaged should be within ±0.2 of each other .

Note :

Decimal – given to 1 or 2 d.p consistently.
Accuracy - ± 0.1 s.v 1mk)
± 0.2 s.v ½ mk . otherwise penalize fully.

e) Moles of acid T in $10cm^3$.
Moles of NaOH = $\frac{\text{ans. In b(ii)} \times \text{average volume}}{1000}$ √ ½
= correct ans. √1/2
Moles ratio 1:1
: moles of acid T = Moles of NaoH
= Correct ans. √1
(Max 2maks)
NB: Penalize fully for strange "values"

2. ii) Moles of acid T in $100cm^3$ of solution of acid T.
= $\frac{\text{Correct ans in e) i) above x100}}{10}$ √1/2
= Correct ans.. √½

iii) Solubility of the acid.
RMM of acid T, $C_7 H_6 O_2$ = 122
Mass of T in $100cm^3$ of acid T = Correct ans in (e) (ii) Above. ×122 √1/2
= correct Ans. √1/2
Solubility of acid T at Room Temperature
= corr. Ans above g/100g of water. √½

Note : penalize ½ for missing units .

PROCEDURE	***EXPECTED OBSERVATION***
a) Step i. To solid F in a boiling tube, add distilled water√ ½ and shake. Divide into 4 portions.	F dissolves forming a colourless solution. √ ($^1/_2$)
b) Step ii . To the 1st portion add sodium hydroxide solution till excess. √ ($^1/_2$)	No white ppt formed. √ ($^1/_2$).
c) Step iii) To the second portion add ammonia solution till excess. ½)√	No white ppt formed. √ ($^1/_2$)
d) Step iv) Dip a glass rod into the 3rd portion and place it on non-luminous Bunsen burner flame. ($^1/_2$) √	Golden yellow flame seen. ($^1/_2$) √
e) Step (v) To the 4th portion add aqueous barium nitrates√½ followed by dilute Nitric acid. √ ½ ***Note : Alternatively :*** ***Step V can be the step II , then.*** ***Step II to be step III.*** ***Step III to be step IV.*** ***Step IV to be step V.***	White ppt formed√ ½persist when $HN0_3$ is added. √ ($^1/_2$) (max. 6mks)
f)	

2. b)

OBSERVATION		INFERENCES
i)	Dissolves√ ($^1/_2$) forming a colorless√ ($^1/_2$) solution.	Soluble salt. √ ($^1/_2$)
ii)	No white ppt formed. √ ($^1/_2$)	Probably Na^+, K^+, NH_4^+ present. √ ($^1/_2$)
iii)	No white ppt formed. √ ($^1/_2$)	Probably Na^+, K^+, NH_4^+, Present. √ ($^1/_2$)
iv)	Golden yellow √ ($^1/_2$)flame observed .	Na^+ present. √ ($^1/_2$)
v)	White ppt√ ($^1/_2$) formed dissolves when HNO_3 is added √ ($^1/_2$) forming a colorless solution. ***NB: Marks for 2b are tied to 2a above***.	SO_4^{2-} Absent. √ ($^1/_2$)

OBSERVATION	INFERENCES
a) Dissolves forming a colorless solution. √ (1/2)	Polar compound /soluble substance. √ (1/2)
OBSERVATION	**INFERENCES**
b) Yellow colour of K_2 potassium chromate (VI) persist. 1√	R-OH – absent.1√
OBSERVATION	**INFERENCES**
c) Acidified $KMnO_4$ decolorizes $KMnO_4$ changes from purple to colorless. √ 1	| | C = C or –C≡ C– Present √ 1 | |
OBSERVATION	**INFERENCES**
d) Yellow colour of Bromine water persist. √ 1	| | C = C or –C≡ C– absent √ 1 | |
OBSERVATION	**INFERENCES**
e) Effervescence /bubbles formed√ (1/2)	O || R-COOH/-COOH / - C -OH present. Accept H^+ For √ (1/2)mk)
OBSERVATION	**INFERENCES**
f) PH= Any specific value 4,5 ,or 6. √ (1/2).	Weakly √ (1/2)acidic solution. Reject weak acid

(E N D)