CHEMISTRY

FORM THREE

PRACTICAL PAPER 3- 233/3

TERM 2 2019

MARKING SCHEME

Q1(1)   Table   3 titrations   -   1mk

                    2 titrations   -   1/2mk

                    1 titration   -   0mk

(2)   Decimals   1dp or 2dp used consistently   -   1mk

                               (if 2dp,the 2nd should be a 0 or 5)

(3)   Accuracy   -Compare with any of SV within $\pm$ 0.1   -   1mk

                                             $\pm$0.2 - 1/2mk

(4)   Principles of averaging

               2 0r 3 consistent values averaged   -   1mk

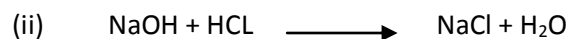   :- penalize 1/2mk for arithmetic error

(5)   Final answer _____ 1mk

                Within $\pm$ 0.1 of SV -   1mk

                $\pm$ 0.2 of SV _____ 1/2mk

(a)   See 4 and 5 above ($\approx$ 23.5cm^3)

(b)(i) $\frac{40g}{40}$ = 1M

No of moles = $\frac{1 \, x25}{1000}$ = 0.025 moles of NaOH

(ii)   NaOH + HCL $\longrightarrow$ NaCl + H_2O

Mole ratio

NaOH : HCl

   1 : 1

0.025 : ?   = 0.025 moles of HCl

(iii)   0.025 moles = X (volm from (a) above)

?   = 100cm^3

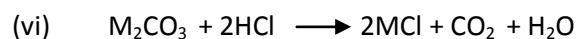$\frac{0.025 \, x \, 100}{X}$ = $\frac{2.5}{X}$ moles of HCl

(iv)

2 moles —— 1000cm^3

   ? ____ 100cm^3

= $\frac{100 \, x \, 2}{1000}$ = 0.2 moles of P

(v)   (0.2 - $\frac{2.5}{X}$)   moles of HCl

(vi) M_2CO_3 + 2HCl $\longrightarrow$ 2MCl + CO_2 + H_2O

Mole ratio

M_2CO_3 : HCl

   1 : 2

$$? \quad \underline{\quad} \quad 0.2 - \frac{2.5}{x}$$

$$= (0.2 - \frac{2.5}{X}) \times \tfrac{1}{2} = \text{moles of Q}$$

(vii) $RFM = \dfrac{5.0}{\left(0.2 - \frac{2.5}{X}\right)X\frac{1}{2}}$

(viii) $2M + 60 = \dfrac{5.0}{\left(0.2 - \frac{2.5}{X}\right)x\frac{1}{2}}$

$M = \dfrac{1}{2}\left(\dfrac{5.0}{\left(0.2 - \frac{2.5}{X}\right)x\frac{1}{2}} - 60\right)$

		Observations	Inferences
Q2	(a)(i)	Dissolves to form a	presence of a soluble salt
		Colourless solution	Award absence of coloured ions
	(ii)	No white ppt formed	Absence of Pb^{2+}, Al^{3+}, Zn^{2+}
	(iii)	Burns with a yellow flame	Presence of Na^+
	(b)(i)	Dissolves to form a colourless solution	As (a)(i) above
	(ii)	Effervescence is produced	Presence of a CO_3^{-2}
	(c)(i)	– solid changes from white to	-Presence of Zn^{2+}
		Yellow and back to white	- Presence of NO_3^-
		On cooling	-Presence of an acidic gas
	-	Brown gas is produced	
	-	Turns wet blue litmus paper red and red remains red	
	-	Relights a glowing splint	- Presence of O_2 ½ each for any 3

(ii) - Dissolves to form a colourless solution   - Presence of a soluble salt

\-   White ppt formed, soluble in excess   - Presence of Zn^{2+}

_____

(d) White ppt formed insoluble in excess	Presence of Pb^{2+}, Al^{3+}
(e) Blue ppt formed, soluble in excess to form a deep blue solution	Presence of Cu^{2+}
(f)(i) PH 1 or 2	Presence of a strong acid
(ii) Produces effervescence and a gas that burns with a pop sound	- Presence of an acidic solution - Allow presence of H+
(iii) Produces effervescence and a colourless gas	- Presence of an acidic solution - Allow presence of H+