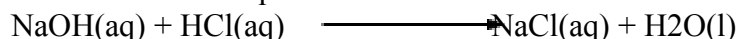


**TERM II**  
**CHEMISTRY PAPER 3 (PRACTICAL)**  
**FORM THREE MARKING SCHEME**

1. CT – 1mk  
 D.P – 1 mk  
 Accuracy (1 mk)

(a) Average volume of solution X = 25.0cm<sup>3</sup> (1 mk)

(b) Moles of solution X required



1:1 (1/2 mk)

$$\text{Moles of NaOH} = \frac{0.2 \times 25}{1000} = 0.005 \text{ moles (1/2 mk)}$$

$$\text{Moles of solution X} = \frac{0.005 \times 1}{1} = 0.005 \text{ moles (1 mk)}$$

(c) Molarity of solution X

No. of moles = 0.005 moles

0.005 moles                      25cm<sup>3</sup>

?                                      1000 cm<sup>3</sup>

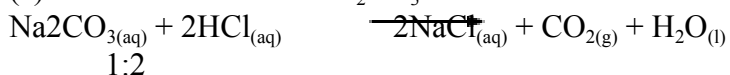
$$= \frac{0.005 \times 1000}{25} \text{ (1 mk)} = 0.2\text{m (1 mk)}$$

**Procedure II**

CT – 1 mk  
 D.P – 1 mk  
 Accuracy – 1 mk

(d) Average volume of solution X  
 = 25.0 cm<sup>3</sup> (1 mk)

(e) Number of moles of Na<sub>2</sub>CO<sub>3</sub> in 25cm<sup>3</sup>



$$\text{Moles of HCl reacting} = \frac{0.2 \times 25}{1000}$$

$$= 0.005 \text{ moles (1/2 mk)}$$

Mole ratio – Na<sub>2</sub>CO<sub>3</sub>:HCl  
 1:2 (1/2 mk)

$$\text{Moles of Na}_2\text{CO}_3 = \frac{1}{2} \times 0.005 \text{ (1/2 mk)} = 0.0025 \text{ moles (1/2 mk)}$$

(f) Concentration of sodium carbonate in moles per litre.

0.0025 moles                      25cm<sup>3</sup>

?                                      1000cm<sup>3</sup>

$$\frac{0.0025 \times 1000}{25} \text{ (1 mk)} = 0.1 \text{ M (1 mk)}$$

2. (a)

| Observations                                                 | Inferences                      |
|--------------------------------------------------------------|---------------------------------|
| - Solid turns to yellow and then to white on cooling. (1 mk) | Zn <sup>2+</sup> present (1 mk) |
| - A gas that turns moist blue litmus paper to red.           | The gas is acidic               |

(b) (i)

| Observations                                  | Inferences                      |
|-----------------------------------------------|---------------------------------|
| A white precipitate soluble in excess. (1 mk) | Zn <sup>2+</sup> present (1 mk) |

|                                                                   |                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                   |                                                                                                                                                                                                                                                |
| (ii)                                                              |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| A white ppt present (1 mk)                                        | $\text{SO}_4^{2-}$ , $\text{Cl}^-$ , $\text{CO}_3^{2-}$ present (1 mk for any two)                                                                                                                                                             |
| (c)                                                               |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| Effervescence present (1 mk)                                      | $\text{CO}_3^{2-}$ present (1 mk)                                                                                                                                                                                                              |
| (i)                                                               |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| A white ppt which dissolves in excess (1 mk)                      | $\text{Zn}^{2+}$ present (1 mk)                                                                                                                                                                                                                |
| (ii)                                                              |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| No white ppt (1 mk)                                               | $\text{SO}_4^{2-}$ , $\text{Cl}^-$ , $\text{SO}_3^{2-}$ absent (1 mk for any two)                                                                                                                                                              |
| 3. (a) (i)                                                        |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| Solid burns with a sooty flame (1 mk)                             | $\text{C} \begin{array}{c} \diagup \quad \diagdown \\ \text{---} \quad \text{---} \end{array} \text{C} \begin{array}{c} \diagup \quad \diagdown \\ \text{---} \quad \text{---} \end{array}$ or $-\text{C}=\text{C}-$ present (1/2 mk for each) |
| (b) (i)                                                           |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| Solid dissolves forming a colourless solution. (1/2 mk)           | The solid is polar (1/2 mk)                                                                                                                                                                                                                    |
| (ii)                                                              |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| Purple acidified potassium manganate (vii) is decolourised (1 mk) | $\text{C} \begin{array}{c} \diagup \quad \diagdown \\ \text{---} \quad \text{---} \end{array} \text{C} \begin{array}{c} \diagup \quad \diagdown \\ \text{---} \quad \text{---} \end{array}$ or $-\text{C}=\text{C}-$ present (1/2 mk for each) |
| (iii)                                                             |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| Orange acidified Potassium dichromate (vi) turns to green. (1 mk) | $\text{C} \begin{array}{c} \diagup \quad \diagdown \\ \text{---} \quad \text{---} \end{array} \text{C} \begin{array}{c} \diagup \quad \diagdown \\ \text{---} \quad \text{---} \end{array}$ or $-\text{C}=\text{C}-$ present (1/2 mk for each) |
| (iv)                                                              |                                                                                                                                                                                                                                                |
| Observations                                                      | Inferences                                                                                                                                                                                                                                     |
| Effervescence present (1 mk)                                      | $\text{H}^+$ present (1 mk)                                                                                                                                                                                                                    |

(v)

| Observations   | Inferences                        |
|----------------|-----------------------------------|
| PH is 5 (1 mk) | Solution is weakly acidic. (1 mk) |