

4.6.3 Chemistry Practical Paper 3 (233/3)

Procedure I

1. Table 1

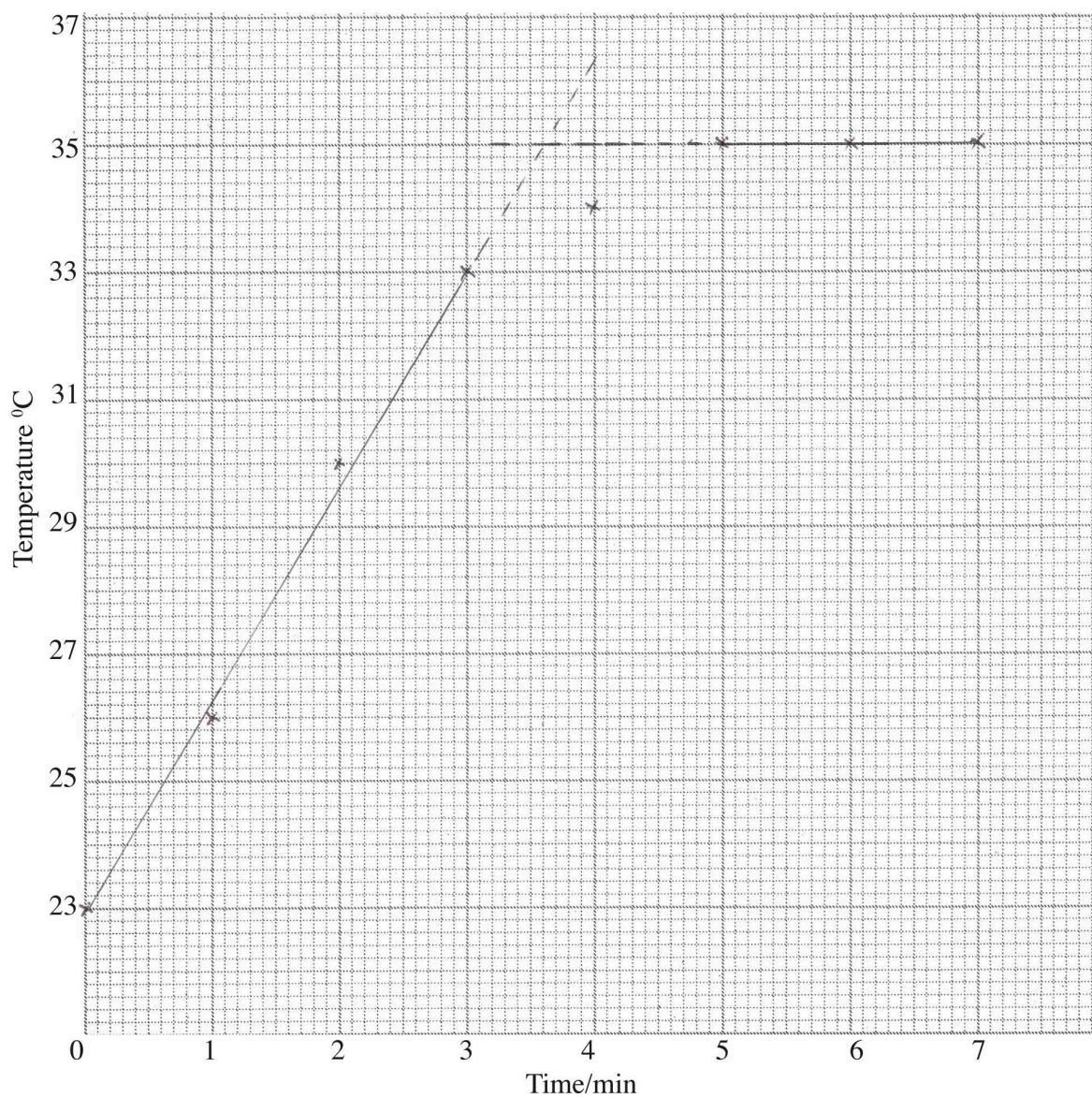
Time (Min.)	0	1	2	3	4	5	6	7
Temperature ($^{\circ}\text{C}$)	23.0	26.0	30.0	33.0	34.0	35.0	35.0	35.0

$\frac{1}{2}$ mark for each correct entry,

Maximum (3 marks)

(a) (i)

(3 marks)



(ii) (I) $\Delta T = 35 - 23 = 12^{\circ}\text{C}$. (1 mark)

(II) 3 minutes 36 seconds. ($\frac{1}{2}$ mark)

(iii) $\Delta H = 50 \times 4.2 \times 12$
 $= 2520$ joules. (2 marks)

Procedure II

Table 2

	I	II	III
Final burette reading	24.50	25.00	34.20
Initial burette reading	0.00	1.00	10.20
Volume of solution C (cm ³)	24.50	24.00	24.00

(4 marks)

(a) Average volume = $\frac{24.5 + 24.0 + 24.0}{3} \sqrt{\frac{1}{2}}$
 $= 24.17 \text{ cm}^3 \sqrt{\frac{1}{2}}$ ($\frac{1}{2}$ mark)

(b) (i) Moles of $\text{MnO}_4^- = \frac{0.02 \times 24.17}{1000} \sqrt{\frac{1}{2}}$
 $= 4.83 \times 10^{-4} \sqrt{\frac{1}{2}}$ (1 mark)

(ii) Moles of $\text{Fe}^{2+} = 5 \times 4.83 \times 10^{-4} \sqrt{\frac{1}{2}}$
 $= 2.417 \times 10^{-3} \sqrt{\frac{1}{2}}$ (1 mark)

(iii) Moles of Fe^{2+} in 250 cm³ = $2.417 \times 10^{-3} \times 10 \sqrt{\frac{1}{2}}$
 $= 2.417 \times 10^{-2} \sqrt{\frac{1}{2}}$ (1 mark)

(c) Molar heat of displacement = $\frac{2520}{2.417 \times 10^{-2}} \sqrt{(1)}$ (1 mark)

= 104261.48 Joules $\sqrt{(1)}$ (1 mark)

2 (a)

(i)

Observations

- White solid turns yellow
- Splint extinguished
- On cooling solid is white
- Colourless, odourless gas.

(max. 1 mark)

Inferences

Probably CO_2 gas given off.
 $\therefore \text{CO}_3^{2-}$ or HCO_3^- , ZnO formed

(max. 1 mark)

(2 marks)

(ii)

Observations

- effervescence/bubbles
- colourless, odourless gas

(1 mark)

Inferences

CO_3^{2-} present

(1 mark)

(2 marks)

(iii)

Observations

- White ppt soluble in excess

(1 mark)

Inferences

Zn^{2+} present

(1 mark)

(2 marks)

(b)

(i)

Observations

White ppt insoluble in excess

(1 mark)

Inferences

Pb^{2+} or Al^{3+} Mg^{2+}

(1 mark)

(2 marks)

(ii)

Observations

- No effervescence
- No white ppt

(1 mark)

Inferences

CO_3^{2-} SO_3^{2-} absent
 Pb^{2+} absent

or
 Al^{3+} and Mg^{2+} present

(1 mark)

(2 marks)

(iii)

Observations

White ppt

(1 mark)

Inferences

SO_4^{2-} present

(1 mark)

(2 marks)

3. (a)

Observations

Melts and then burns with a sooty/
smoky/Luminous flame/yellow flame.
(1 mark)

Inferences

Long chain organic compound
or



(1 mark)

(2 marks)

(b) (i)

Observations

Not decolourised
(1 mark)

Inferences

ROH $\text{C} = \begin{array}{c} | \\ \text{C} \\ | \end{array}$ or $\text{C} \equiv \begin{array}{c} | \\ \text{C} \\ | \end{array}$ absent

(1 mark)

(2 marks)

Observations

Effervescence/bubbling
Colourless gas
(1 mark)

Inferences

Carboxylic acid present.
 H^+ or H_3O^+ or RCOOH

(1 mark)

(2 marks)

Method used

- Add 2 drops of universal indicator to solution.
- Match the colour of solution to the pH chart paper
- Read off pH.

(2 marks)

Inferences

- pH is 1 or 2
- Solution is strongly acidic

(1 mark)

(3 marks)