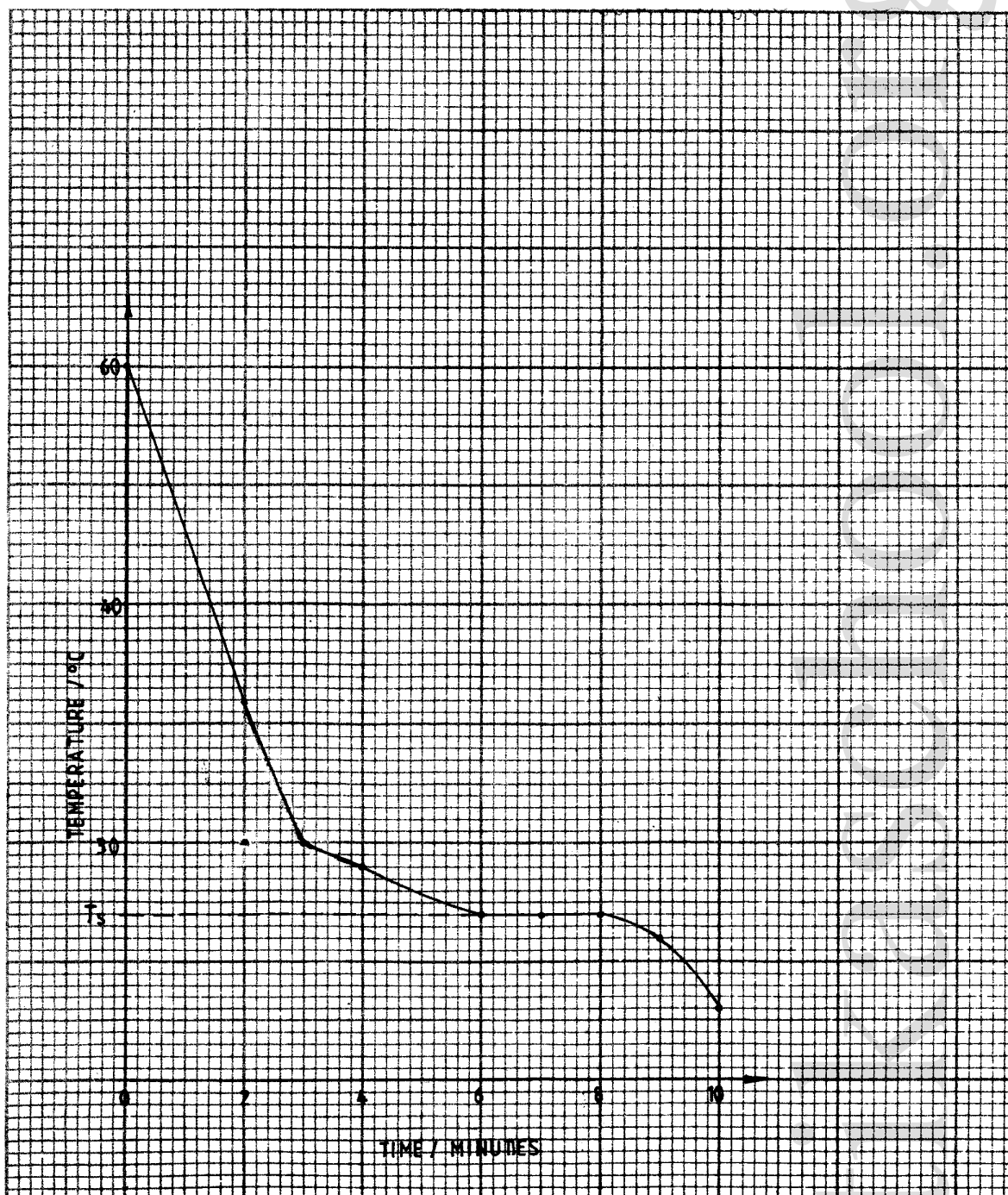


### 4.7.3 Chemistry Practical Paper 3 (233/3)

1. (a)

Time (minutes)	0	2	3	4	5	6	7	8	9	10
Temperature (°C)	60.0	36.0	30.0	29.0	27.5	27.0	27.0	27.0	26.0	23.0

(5 marks)



(a)  $T_s$  is  $27(^{\circ}\text{C})$ .<sup>(1)</sup> (3 marks)

(b) Solubility at  $T_s$ .<sup>(1)</sup>  
2 g of A in  $10 \text{ cm}^3$  of  $\text{H}_2\text{O}$   
?  $100 \text{ cm}^3$  of  $\text{H}_2\text{O}$

$$\frac{2 \times 100}{10} = 20 \text{ g} \text{ } ^{(1)}$$

Table 2

	I	II	III
Final burette reading	30.80	38.70	30.70
Initial burette reading	0.00	8.00	0.00
Volume of solution A ( $\text{cm}^3$ ) used	30.80	30.70	30.70

(3 marks)

(a) (i) Average volume of solution A.

$$\frac{30.7 + 30.7}{2} = 30.7 \text{ cm}^3$$

(1 mark)

(ii)  $\frac{25}{1000} \times 0.05 = 1.25 \times 10^{-3}$  moles

(1 mark)

(b) (i) Acid: substance A

$$\begin{aligned} 2 & : 1 \\ & = \frac{1.25 \times 10^{-3}}{2} = 6.25 \times 10^{-4} \end{aligned}$$

(1 mark)

(ii)  $6.25 \times 10^{-4}$  moles in 30.7  
? moles in 1000

$$\frac{6.25 \times 10^{-4} \times 10^3}{30.7} = 0.02 \text{ m}$$

(iii) Molarity -  $\frac{\text{Conc g/L}}{\text{RAM}}$

$$\begin{aligned} 2\text{g} - 250 \\ ? - 1000 \\ \frac{2 \times 1000}{250} = 8 \text{ g/L} \end{aligned}$$

(1 mark)

(iv) RFM =  $\frac{\text{conc g/L}}{\text{molarity}}$

$$= \frac{8}{0.02}$$

$$= 400$$

(1 mark)

2. (a)

Observations	Inferences
White precipitate insoluble in excess	Probably $\text{Ca}^{2+}$ , $\text{Mg}^{2+}$ present
(1 mark)	(Accept names of ions) (2 marks)

(b)

Observations	Inferences
No white precipitate No observable change	Calcium ions present ( $\text{Ca}^{2+}$ )
(1 mark)	(1 mark)

(c)

Observations	Inferences
White precipitate	Calcium ions ( $\text{Ca}^{2+}$ )
(1 mark)	(1 mark)

(d)

Observations	Inferences
No effervescence	$\text{CO}_3^{2-}/\text{SO}_3^{2-}$ absent
(1 mark)	(1 mark)

(e)

Observations	Inferences
No white precipitate	$\text{SO}_4^{2-}$ (absent)
(1 mark)	(1 mark)

(f)

Observations	Inferences
White precipitate	$\text{Cl}^-$ present
(1 mark)	(1 mark)

3

(a)

**Observations**  
It is not decolourised

(1 mark)

**Inferences**

L must be saturated

(1 mark)

(b)

**Observations**  
Orange colour persists

(1 mark)

**Inferences**alcohol absent  
or R-OH absent

(1 mark)

(c)

**Observations**  
Effervescence and colourless gas  
evolved

(1 mark)

**Inferences**

L is acidic or carboxylic acid present

 $H^+$ ,  $H_3O^+$ , R-COOH

(1 mark)

(d)

**Observations**  
Effervescence and colourless gas  
evolved

(1 mark)

**Inferences** $H^+$ ,  $H_3O^+$ , R-COOH confirmed.

(1 mark)