

Table 4

Final	17.5
Initial	20.0
Temp $^{\circ}\text{C}$	2.5

Q1 Table 4

i) $\Delta H = mc\Delta T$

Mass = $30\text{g} \times 1\text{g/g}$

$2 \times 30\text{g}$

ii) $= 30\text{g} \times 4.2\text{J/g}^{\circ}\text{C} \times 2.5^{\circ}\text{C}$

$= +315\text{J/g}$

iii) ~~Molar mass of CO_2~~

molar mass = $\frac{\text{mass}}{\text{Rfm}}$

$= \frac{2.5\text{g}}{84\text{g/mole}}$

$= 0.02976\text{ moles}$

$= 0.02976\text{ moles}$

$0.02976\text{ mole} \rightarrow +315\text{J/g}$

1 mole $\rightarrow ?$

$\frac{1 \times 315}{0.02976} = 10,584.7\text{ J/g/mole}$

iv) $\Delta H_3 = \Delta H_2 - \Delta H_1$

$=$

color
Yellow
10:

v)

$$M_1 V_1 = M_2 V_2$$

$$M_1 \times 25 = 0.1 \times 250$$

$$M_1 = \frac{0.1 \times 250}{25}$$

$$= 1.0 M$$

Table 3. (b)

Final	17.0
Initial	20.0
Temp °C	3.0

$$\textcircled{1} \Delta H = mc \Delta T$$

$$\text{Mass} = 30 \text{ cm}^3 \times 1 \text{ g/cm}^3$$

$$= 30 \text{ g}$$

$$= 30 \times 4.2 \text{ J/g}^\circ\text{C} \times 3$$

$$= +378 \text{ J per degree}$$

ii)

$$\text{moles} = \frac{\text{mass}}{\text{RFM}}$$

$$= \frac{2.5 \text{ g}}{84 \text{ g/mole}}$$

$$= 0.02976 \text{ moles}$$

$$\text{iii) } 4 \times 0.02976 \text{ moles} \rightarrow +378 \text{ J/d}$$

$$\frac{1 \times 378}{0.02976} = 12,701.6 \text{ J/mole}$$

v)

$$M_1 V_1 = M_2 V_2$$

$$M_1 \times 25 = 0.1 \times 250$$

$$M_1 = \frac{0.1 \times 250}{25}$$

$$= \underline{\underline{1.0 M}}$$

table 2V

Table 3. (6)

Final	17.0
Initial	20.0
Temp °C	3.0

Q1 Table 3

$$\textcircled{1} \Delta H = mc\Delta T$$

$$\text{mass} = 30 \text{ cm}^3 \times 1 \text{ g/cm}^3$$

$$= 30 \text{ g}$$

$$= 30 \times 4.2 \text{ J/g}^\circ\text{C} \times 3$$

$$= +378 \text{ J per degree}$$

$$\text{ii) moles} = \frac{\text{mass}}{\text{RFM}}$$

$$= \frac{2.5 \text{ g}}{84 \text{ g/mole}}$$

$$= 0.02976 \text{ moles}$$

$$\text{iii) } 0.02976 \text{ moles} \rightarrow +378 \text{ J/d}$$

$$1 \text{ mole} \rightarrow ?$$

$$\frac{1 \times 378}{0.02976} = 12,701.6 \text{ J/mole}$$

Table

1

colour
Yellow
Pink

(ii)

Table 2

	I	II	III
Final	16.5	33.0	16.4
Initial	0.0	16.5	0.0
Vol. of Ca^{2+}	16.5	16.5	16.4

i)
$$\frac{16.5 + 16.5 + 16.4}{3} = 16.4667 \text{ cm}^3$$

ii)
$$0.05 \text{ moles} \rightarrow 1000 \text{ cm}^3$$

$$? \rightarrow 16.47 \text{ cm}^3$$

$$\frac{0.05 \times 16.47}{1000} = 0.0008235 \text{ moles}$$

iii) mole ratio $\text{B} : \text{HCl}$
 $1 : 2$

$$0.0008235 : ?$$

$$\frac{0.0008235 \times 2}{1} = 0.001647 \text{ moles}$$

iv. $16.47 \text{ cm}^3 \rightarrow 0.001647 \text{ moles}$
 $1000 \text{ cm}^3 \rightarrow ?$

$$\frac{1000 \times 0.001647}{16.47} = 0.1 \text{ M}$$

Table 4

Final	17.5
Initial	20.0
Temp °C	2.5

① $\Delta H = mc\Delta T$

Mass = 30g x 5/100

= 30g

② $= 30g \times 4.2 \text{ J g}^{-1} \text{ } ^\circ\text{C}^{-1} \times 2.5^\circ\text{C}$

= +315 J/g

③ ~~mole of Na_2CO_3~~

mole = $\frac{\text{mass}}{\text{RFM}}$

= $\frac{2.5}{84}$

84 g/mole

= 0.02976 moles

0.02976 mole $\rightarrow +315 \text{ J/g}$

1 mole $\rightarrow ?$

$\frac{1 \times 315}{0.02976} = 10,584.7 \text{ J/g/mole}$

④ $\Delta H_3 = \Delta H_2 - \Delta H_1$

2

2 (a) observation	Inference
Solid M melt and burn with yellow sooty flame.	$-C \equiv C-$, $\begin{array}{c} \\ C = C \\ \end{array}$ present

(b) (i) observation	Inference
orange colour of Acidified ~~K₂Cr~~ potassium dichromate persist	R-OH absent.

(ii) observation.	Inference
Yellow bromine water decolourised	$-C \equiv C-$, $\begin{array}{c} \\ C = C \\ \end{array}$ present

(iv) observation	Inference
Effervescence with production of colourless gas	H_3O^+ , H^+ , $R-\overset{O}{\parallel}C-OH$ present.

TABLE 2

	I	II	III
Final burette reading	14.3	14.3	14.1
Initial burette reading	0.0	0.0	0.0
Volume of alk. (2.4ml)	14.3	14.3	14.1

Q1 A i) $\frac{14.3 + 14.3 + 14.1}{3} = \underline{14.23 \text{ ml}}$

ii) $0.05 \text{ ml} \rightarrow 1000 \text{ cm}^3$
 $\quad \quad \quad \rightarrow 25 \text{ cm}^3$

$\frac{25 \times 0.05}{1000} = 0.00125 \text{ moles}$

iii) Mole mole mol : compound B
 $\quad \quad \quad 2 \quad 1$
 $\quad \quad \quad = 0.00125$

$0.00125 \times 2 = \underline{0.0025 \text{ moles}}$

iv) $0.0025 \text{ moles} \rightarrow 14.6 \text{ cm}^3$
 $\quad \quad \quad \rightarrow 250 \text{ cm}^3$

$\frac{250 \times 0.0025}{14.6} = \underline{0.0421 \text{ M}}$

$\frac{0.0421 \times 250}{14.6} = 0.0421 \text{ mole}$

v) $0.0421 \text{ moles} \rightarrow 250 \text{ cm}^3$
 $\quad \quad \quad \rightarrow 1000 \text{ cm}^3$

$\frac{1000 \times 0.0421}{250} = \underline{0.1724 \text{ M}}$

vi) $0.0421 \rightarrow 25 \text{ cm}^3$
 $\quad \quad \quad 1000 \text{ cm}^3$
 $\frac{1000 \times 0.0421}{25} = \underline{1.724 \text{ M}}$