MUSJET 233/3 MARKING SCHEME

TABLE I ---------- 5MARKS

distributed as follows:-

A Complete table ---------- 1mk

B Decimal ---------- 1mk

(1d.p or 2 d.p. used consistently. If 2 d.p. are used, the last digit should be 0 or 5

C Accuracy ---------- 1mk

D Principle of averaging ---------- 1mk

E Final accuracy ---------- 1mk

Calculations

(ii) moles of sodium thiosulphate used:

$= \frac{0.1 \times \text{average volume in (i)}}{1000}$

= correct answer

(iii) Molar Concentration of Copper (II) ions in solution A.

Moles of Cu^{2+} in $25cm^3$ = Correct ans. in (ii)

Molarity of $A_2 = \frac{1000 \times \text{Correct ans in (ii)}}{25}$

= answer (*)

$C_1V_1 = C_2V_2$

$C_1 \times 25 =$ answer (*) $\times 250$

$C_1 = \frac{\text{answer (*)} \times 250}{25}$

= Correct ans.

TABLE II 4 MARKS

distributed as follows:-

A Complete table ---------- 1mk

B Decimal ---------- 1mk.

(1d.p used consistently as .0 or .5)

C Accuracy ---------- 1mk

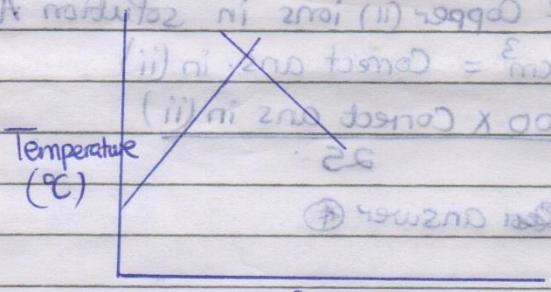
D Trend ..... (1mk)

- Rise in temperature values to a maximum followed by a drop ..... (1mk)
- Rise in temperature values to a maximum without a drop ..... ($\frac{1}{2}$mk)

GRAPH ..... (3mks) distributed as follows:-

- Labelling of axes ..... $\frac{1}{2}$mk
- Scale ..... $\frac{1}{2}$mk
- Plotting 1mk
- ~~Graph~~ Lines of best fit 1mk

NB
- The two lines of best fit must intersect at a point that is above all the plotted points.
- The first line of best fit must pass through the first plotted point (Temperature



(ii)

I) Correct value from a correctly extrapolated graph ✓$\frac{1}{2}$mk
Showing on the graph. ✓$\frac{1}{2}$mk

II) Correct Highest temperature value from the graph ✓$\frac{1}{2}$mk.
ΔT = Highest temp. − temperature at volume ✓$\frac{1}{2}$mk.
from graph of D=0

QUESTION 2.

(a) OBSERVATIONS • Green solid changes to black on heating. • moist blue litmus paper turns red and red litmus paper remains red.	INFERENCES • Cu^{2+} present • Acidic gas.
(b) OBSERVATIONS • Black solid dissolves to form a blue solution.	INFERENCES • Cu^{2+} present.
(c)(i) OBSERVATIONS Blue ppt that dissolves in excess $NH_{3(aq)}$ to form a deep blue solution.	INFERENCES Cu^{2+} present.
(ii) OBSERVATIONS • Blue solution fades gradually to colourless • Brown solid deposited.	INFERENCES • Cu^{2+} reduced to $Cu_{(s)}$ • Cu^{2+} displaced • Solid K is a strong oxidising agent.

QUESTION 3

(a) OBSERVATIONS	INFERENCES
Burns with a yellow smoky/sooty flame	$-C=C-$, $-C\equiv C-$ present.
(b) OBSERVATIONS	INFERENCES
Dissolves to form a colourless solution	Polar substance.
(c)(i) OBSERVATIONS	INFERENCES
Effervescence/bubbles	R-COOH present.
(ii) OBSERVATIONS	INFERENCES
Orange acidified $K_2Cr_2O_7$ turns green.	R-OH present.
(iii) OBSERVATIONS	INFERENCES
Purple acidified $KMnO_4$ is decolourised.	$-C=C-$, $-C\equiv C-$, R-OH present

(iii) Molar enthalpy change for the reaction.

Total volume = 20 + Correct ans in (ii)(I) = m

$\Delta H = mC\Delta T$

$= \frac{m \times 4.2 \times 6.4}{1000}$

= ans ⊛

Moles of Cu^{2+} used = $\frac{\text{Correct ans in procedure I(iii)} \times 20}{1000}$

Molar enthalpy = ans ⊛ ÷ $\left(\frac{\text{Correct ans in procedure I (iii)} \times 20}{1000}\right)$.

= Correct answer.