KENYA NATIONAL EXAMINATION COUNCIL

KCSE 2007

CHEMISTRY
PAPER 3
MARKING SCHEME

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24.6.3 Chemistry Paper 3 (233/3)

1. (A)

	I	II	III
Final burette reading	21.8	21.6	43.6
Initial burette reading	0.0	0.0	22.0
Volume of D used (cm^3)	21.8	21.6	21.6

(3 marks)

(i) $\frac{21.6 + 21.6}{2}$ = $21.6cm^3$ ***(1 mark)***

(ii) R.F.M of Na_2CO_3 = 106

Conc. $\frac{8}{106} = 0.075M$ ***(1 mark)***

(iii) Moles of Na_2CO_3 = $\frac{25 \times 0.075}{1000}$

$= 0.001875$

Moles of H_2SO_4 = 0.001875

Conc. of H_2SO_4 = $\frac{0.001875}{21.6} \times 1000$

$= 0.0868M$ ***(2 marks)***

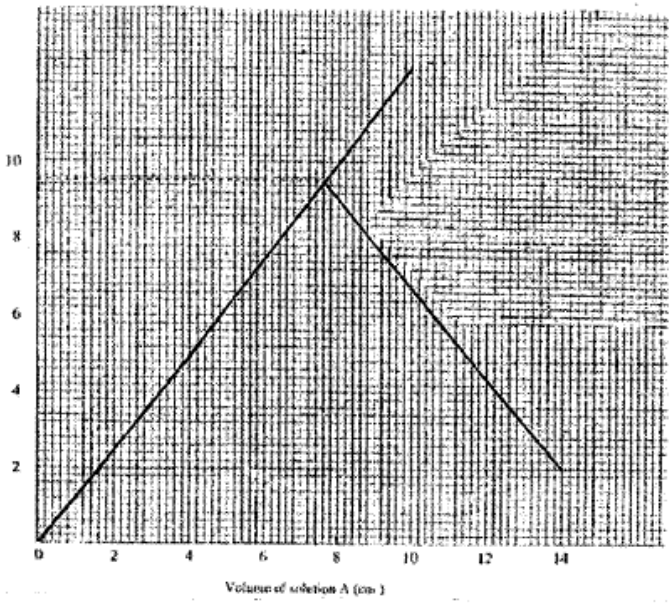
(iv) 0.0868 x 10 $= 0.868M$ ***(1 mark)***

(B)

Test-tube number	1	2	3	4	5	6
Volume of solution A (cm^3)	2	4	6	8	6	4
Volume of solution C (cm^3)	14	12	10	8	10	12
Initial temperature of solution C (^0C)	20.5	20.5	20.5	20.5	20	20
Highest temperature of mixture (^0C)	23	25.5	28.0	29.5	26.5	24.5
Change in temperature ΔT	2.5	5.0	7.5	9.0	6.5	4.5

(6 marks)

(ii)



(3 marks)

(ii) I $\Delta T = 9.5 \pm 0.1^0C$ ***(1 mark)***

II Maximum volume of A = $7.6\ cm^3 \pm 0.1$ ***(1 mark)***

(iii) I Moles of sulphuric Acid $= \frac{7.6 \times 0.868}{1000}$

$= 0.0066$ moles ***(1 mark)***

II Heat evolved $16 \times 4.2 \times 9.5$

$= 638.4$ joules

Molar Heat $= \frac{638.4}{0.0066}$

$= 96.727272\ KJ\ mol^{-1}$ ***(2 marks)***

2. (a)

Observations	**Inferences**
Gas with a pungent/irritating/choking smell.	
Colourless liquid formed on cool part of test tube.	Hydrated salt.
Blue litmus paper turns red.	Acidic gas evolved.
Red litmus paper remains red.	
Solid turns reddish brown.	

(3 marks)

(b)

Observations	**Inferences**
i) Reddish brown solution. PH 1,2,3,	Strongly acidic. ***(2 marks)***
ii) Brown precipitate insoluble in excess.	Fe^{3+} ***(2 marks)***
iii) Brown/Black solid formed or solution changes from yellow to brown.	Iodide ions oxidised to Iodine ***(2 marks)***
iv) White Precipitate settles at the bottom of the test tube.	SO_4^{2-} present. ***(2 marks)***

3. (a)

Observations	**Inferences**
a) Clear blue flame.	Saturated low carbon organic compound. ***(2 marks)***
b) No separation or forms a solution Two liquids are miscible.	Mixture is miscible or polar organic compound. ***(1 mark)***
c) No effervescence.	Liquid not acidic or absence of H^+. ***(2 marks)***
d) Solution changes from orange to green.	F is likely to be alcohol ***OR*** R – OH . ***(2 marks)***