

SERIES 40 EXAMS

233/3

CHEMISTRY

PAPER 3

MARKING SCHEME

1. a) For the table 1
 Penalize 1mk for unrealistic
 Values of temperature e.g
 Recording temperature teachers
 Temperature by 10 °C
 Values should give at least highest temperature of about 7.5 – 10°C
- b) i) Scale – 1mk
 Correct point– 1mk
 Graph - 1mk
- ii) ½ mk for using graphn (must show dotted line on graph or blocked liner)
 ½ mk for correct answer
 If not shown in graphs penalize fully.
- iii) MCAT
 $= 50 \times 4.2 \times \text{higher of mixtutr} \checkmark \frac{1}{2} \text{ mk}$ $M \equiv 50 \times 14.0\text{g/cm}^3 \checkmark \frac{1}{2} \text{ m} = 50\text{g}$
 $50 \times 4.2 \times \Delta t \checkmark 1 \text{mk}$
 Penalise ½ mk for omitting units of wrong units in final answer
- Accept J or kJ units
 Penalise ½ mk for omitting –sing for exothermic process or use of (+) sign instead of(-)
- iv) Value obtain in b(iii) ✓ 1mk Ans ✓ 1mk
 320
- Penalise ½ mk for omitting moles of use of M for moles

Tables

	I	II	III
Final burette reading	16.0	32.1	48.1
Initial burette reading	0.0	16.1	32.1
Volume of sodium hydroxide used (cm ³)	16.1	16.0	16.0

CT – 1mk

Decimal – 1mk

Precision – 1mk

Accuracy – 1mk

(4mks)

- c) i) School volume $\frac{t_1 + t_2 + t_3}{3}$
 $V_1 \text{cm}^3$
Penalise ½ mk for omitting unit
- Working should ben clearly showed
- ii) $I : \frac{V_1 \times 1.25}{1000} = 0.00025 V_1$ 1mk

II Moles ratio between H_2SO_4 and $\text{NaOH} = 1 : 2$ ✓ 1mk

Moles of H_2SO_4 in $25\text{cm}^3 = \frac{1}{2} \times 0.00025V_1$

$= 0.000125V_1$ ✓ 1mk

III $\frac{0.000125V_1}{25} \times 250$ ✓ $\frac{1}{2}$ mk = $\frac{0.00125V_1}{50}$ ✓ $\frac{1}{2}$ mk

d) Moles of part b(iv) + $0.00125V_1 =$ ✓ Ans 1mk

e) $\frac{\text{Ans part (d)} \times 1000}{50}$ ✓ 1mk = Ans 1mk

2. a)

Observation	Inference
- Colourless liquid ✓ 1mk/ forms on cooler part of the test – tube -Red litmus paper change ✓ 1mk of blue and blue litmus paper remain unchanged (2mks)	Hydrate salt ✓ 1 NH_4^{+} ions (2mks)

Observation	Inference
b)i) Solid dissolve in water to form a colourless solution ✓ 1mk (2mks)	A soluble salt ✓ 1mk (2mks)

Observation	Inference
ii) White precipitate ✓ 1mk does not dissolve (2mks)	SO_4^{-2} , $\text{Cl}^{-}(\text{aq})$ ions (2mks)

Observation	Inference
iii) White precipitate ✓ $\frac{1}{2}$ mk does not dissolve ✓ 1mk (2mks)	SO_4^{-2} ✓ $\frac{1}{2}$ mk (2mks)

Observation	Inference
iv) Green precipitate does not dissolve ✓ 1mk (2mks)	$\text{Fe}^{+2}(\text{aq})$ ions ✓ 1mk (2mks)

Observation	Inference
v) Yellow solution formed ✓ 1mk (2mks)	$\text{Fe}^{+3}_{(\text{aq})}$ ions 1mk (2mks)