

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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## MARK SCHEME for the May/June 2014 series

### 5070 CHEMISTRY

5070/32

Paper 3 (Practical Test), maximum raw mark 40

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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1 (a) Temperature readings

F: full set of temperatures provided for columns D and E (1)

R: temperatures recorded to 0.5°C (1)

S: temperature rises correctly calculated, 6 correct (1) OR all correct (2)

P: pattern of results:

a general rise then fall (1)

experiments 1–3 increasing temperature rise (1)

experiments 4–7 decreasing temperature rise (1)

Accuracy:

For each of the experiments 1–7 give 1 mark for each temperature rise within 1.0 °C of the supervisor's value (7)

[14]

(b) Graph

Correct plotting of all the points (1)

Two intersecting straight lines which fit the results as plotted (1)

[2]

(c) Volume of P

Correct recording of the volume from the graph at the point of intersection of the two lines (1)

[1]

Mark parts (d) – (f) using the candidate's volume of P.

Assuming the volume of P is 23.0 cm<sup>3</sup>:

(d) Number of moles of HCl in 23.0 cm<sup>3</sup> of P

$$= \frac{23.0 \times 1.50}{1000}$$

$$= 0.0345 \text{ (1)}$$

[1]

(e) Number of moles of NaOH which react

$$= 0.0345 \text{ (1)}$$

[1]

(f) Concentration in mol/dm<sup>3</sup> of Q

Volume of Q

$$50.0 - 23.0 = 27.0 \text{ (1)}$$

Concentration of Q

$$= \frac{0.0345 \times 1000}{27.0}$$

$$= 1.28 \text{ (1)}$$

[2]

[Total: 21]

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2 R is hydrochloric acid S is sodium thiosulfate

Test	Notes
<p><b>General points</b>            For ppt            allow solid, suspension, powder</p> <p>For gases            Name of gas requires test to be at least partially correct.            Effervesces = Bubbles = gas vigorously evolved but not gas evolved</p>	
<p><b>Test 1</b></p> <p>bubbles (1)</p> <p>gas pops with a lighted splint (1)</p> <p>hydrogen (1)</p> <p>metal disappears (1) [4]</p>	<p>to score hydrogen mark there must be some indication of a test e.g. 'popped with a splint', 'tested with a burning splint'</p>
<p><b>Test 2</b></p> <p>(a) white ppt (1)</p> <p>(b) ppt remains (1) [2]</p>	
<p><b>Test 3</b></p> <p>white or yellow ppt (1)</p> <p>manganate(VII) decolourised (1)</p> <p>pungent gas/sulfur dioxide (1) [3]</p>	<p>allow turns colourless/white/brown</p>
<p><b>Test 4</b></p> <p>decolourised (1) [1]</p>	<p>allow turns colourless</p>
<p><b>Test 5</b></p> <p>white/yellow/red/brown ppt (1)</p> <p>colour of ppt darkens (1) [2]</p>	

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Test	Notes
<b>Test 6</b>	
(a) solution turns purple/red/violet(1)	accept dark brown
solution finally colourless/pale yellow (1)	accept colour fades/becomes paler
(b) green (1)	accept black-green
ppt (1)	
insoluble in excess (1) [5]	

[maximum 16 marks from 17 scoring points]

### Conclusions

Cation in **R** is  $H^+$ . (In Test 1 metal reacts.) (1)

Anion in **R** is  $Cl^-$ . (In Test 2 there must be a white ppt which remains in nitric acid.) (1)

If both ions in **R** are correct but inverted, allow one mark from the previous two.

**S** is a reducing agent. (Test 4 decolourised or green ppt in Test 6) (1) [3]

[Total: 19]