

**MARK SCHEME for the May/June 2010 question paper  
for the guidance of teachers**

**5070 CHEMISTRY**

**5070/42**

Paper 4 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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- 1 (a) (gas) syringe (1)
- (b) lime water turns milky / cloudy / white / chalky ppt. (1)
- (c) 72 (1) cm<sup>3</sup>
- (d) 0.003 (1)
- (e) (i) 0.003 (1)  
(ii) 100 (1)  
(iii) 0.3 (1) g
- (f) 84 (1) 0.3 /  $84 \times 24000 = 85.7(86)$  (1) cm<sup>3</sup> [9]
- 2 (a) (i) shiny, silver or grey (1) (solid)  
(ii) blue solution / liquid (1)
- (b) (i) beaker gets warm or wtte (1)  
(ii) copper (1) (accept Cu but not Cu(II))
- (c) zinc dissolves / disappears; blue colour fades / disappears;  
fizzes / bubbles / effervescence / gas evolved. Any 2 (2)
- (d) (i)  $\text{Zn} + \text{CuSO}_4 = \text{ZnSO}_4 + \text{Cu}$  (1)  
(ii) redox, displacement, reduction and / or oxidation (1) [8]
- 3 (c) [1]
- 4 (b) [1]
- 5 (c) [1]
- 6 (b) [1]
- 7 (c) [1]

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8 (a) pipette (1)

(b) yellow to pink, orange or red (1)

(c) 22.8                      39.7                      31.3  
0                                17.5                      8.9  
22.8                          22.2                      22.4

[Mark rows or columns to the benefit of the candidate. One mark for each correct row or column] (3)

Mean value 22.3 (1) cm<sup>3</sup>

(d) 0.001 (1)

(e) 0.002 (1)

(f) 2 (1)

(g) 2 (1)

(h) (i) H<sub>2</sub>SO<sub>4</sub> or sulfuric acid (1) (no H<sub>2</sub>A)

(ii) H<sub>2</sub>SO<sub>4</sub> + 2NaOH = Na<sub>2</sub>SO<sub>4</sub> + 2H<sub>2</sub>O (1)  
(ecf on (g) and (h)(i))

[12]

9 (a) transition metal / element / d-block but not V is a transition metal (1)

(b) (i) green ppt. (1)

(ii) insoluble in excess (1)

(iii) gas turns litmus blue (1) ammonia (1)

(c) aq. barium chloride / nitrate + hydrochloric / nitric acid (2)  
white ppt. (1)

(d) aq. silver nitrate / nitric acid (2) white ppt. (1)  
In parts (c) and (d) no acid or 'acidified' can score 2/3  
White ppt. on own or no BaCl<sub>2</sub> or AgNO<sub>3</sub> no marks  
No Pb(NO<sub>3</sub>) test.  
Use of BaSO<sub>4</sub>, AgCl, H<sub>2</sub>SO<sub>4</sub> or HCl in test white ppt. mark only  
Conclusion: NH<sub>4</sub>Cl / (NH<sub>4</sub>)<sub>2</sub> SO<sub>4</sub> (1) FeCl<sub>2</sub> / FeSO<sub>4</sub> (1)

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- 10 (a)** 32, 55, 69, 80 all correct (2), one error (1)
- (b)** all points stated in **(a)** plotted correctly (1)  
straight line (use of ruler) and smooth curve (1)  
appropriate extrapolations at lower ends (1) and upper ends (1)
- (c) (i)** 0.35 g (1)  
**(ii)** 2.6 g (1)
- (d)** 75°C (1)
- (e)** 35 g / 100 g of water (1)  
For **(c)**, **(d)** and **(e)** results must be seen on graph.
- (f)** sodium chloride – colourless solution or no solid present (1)  
potassium chlorate(V) – solid and liquid present (1) or some solid dissolved (not ‘all solid undissolved’) or wtte in both cases.  
Mark individually.
- (g)** increase in temperature gives a large increase in solubility of potassium chlorate(V) but not much effect on solubility of sodium chloride (1) wtte. (Comparison required)

In parts **(c)**, **(d)** and **(e)** read candidate's graph in awarding marks.  
Read graphs to + / – half small square.

[13]