

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

**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

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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 × 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]