

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

**MARK SCHEME for the May/June 2011 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) 46 (1) cm<sup>3</sup> [1]
- (b) less (1) rate reduces as reaction progresses (1)  
or acid is less concentrated (1) or CaCO<sub>3</sub> used (1) [2]
- (c) (i) 0.01 (1) moles  
(ii) 100 (1)  
(iii) 0.5 (1) g  
(iv) 120 (1) cm<sup>3</sup> or 0.12 dm<sup>3</sup> (1) so long as units are stated. [4]
- (d) (i) powdered (1) or decrease in particle size (1)  
(ii) increase concentration (1) [2]
- (e) heat (1) or use of a catalyst (1) [1]
- [Total: 10]**

- 2 (a) blue (1) [1]
- (b) (i) **B** (1) (when cell **A** is chosen only a few of the following marks may be obtained as a consequence of the incorrect choice of cell)  
(ii) Copper, pink, brown or orange deposit on **K** (1)  
or **K** increases in size or mass (1)  
electrode **J** reduced in size or mass (1)  
(iii) Cu ion concentration remains the same in solution (1)  
or Cu is removed from **J** at same rate as deposited on **K** (1) [4]
- (c) (i) (blue) to colourless (1) or colour fades (1)  
(ii) H (1)  
(iii) oxygen (1) relights a glowing splint (1)  
(iv) Copper, pink, brown, or orange deposit (1) or electrode gets thicker (1) [5]
- [Total: 10]**

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- 3 (a) (1) [1]
- 4 (c) (1) [1]
- 5 (c) (1) [1]
- 6 (d) (1) [1]
- 7 (b) (1) [1]
- [Total: 5]**
- 8 (a) iron(III) cannot be oxidised (1) or is an oxidising agent (1) or is not a reducing agent (1). [1]
- (b) 5.08 (1) g [1]
- (c) pipette (1) [1]
- (d) colourless, green or yellow to pink or purple (1) [1]
- (e)
- |      |      |      |
|------|------|------|
| 26.3 | 29.4 | 47.2 |
| 0.0  | 3.6  | 21.6 |
| 26.3 | 25.8 | 25.6 |
- 1 mark for each correct row or column, total (3)  
Mean value 25.7 (1) cm<sup>3</sup> [4]
- (f) 0.00046(3) (1) moles [1]
- (g) 0.0023 (1) moles [1]
- (h) (i) 0.023 (1) moles
- (ii) 3.50/3.52 (1) g [2]
- (i) 688/693 (1) g / 1000 g [1]
- [Total: 13]**

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- 9 (a) Transition metal not present (1) [1]
- (b) (i) aq. NaOH (dilute or solution) (1) white ppt. (1)  
(NaOH must be described as aqueous, dilute or in solution).
- (ii) excess aq. NaOH (1) ppt. insoluble (1) [4]
- (c) no ppt. (1) or slight white ppt. (1) [1]
- (d) NaOH (1) Al (1) warm (1)  
NH<sub>3</sub> (1) or gas turns litmus blue (1)  
(Omission of NaOH or Al in test (0) but NH<sub>3</sub> or gas turns litmus blue (1).) [4]  
(Use of nitric acid, any nitrate or ammonium salt in test (0) even if conclusion is correct.)

**[Total: 10]**

- 10 (a) white (ppt) (1) [1]
- (b) 0.58, 1.05, 1.75, 2.33, 2.33, 2.33 (2) (one error 1, > 1 error 0) [2]
- (c) all points plotted correctly (1)  
Two straight lines (2) (joined by a curve (1) only) [3]
- (d) correct point ringed: 1.15 g /4.65 g (1) or 3.6 cm<sup>3</sup> of K (1) [1]
- (e) (i) 5.2 (1) cm<sup>3</sup>  
(ii) 2.33 (1) g  
(iii) 8.0 (1) cm<sup>3</sup>  
(marks awarded based on reading of the candidate's graph.) [3]
- (f)  $\text{BaCl}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{HCl}$  (1) [1]
- (g) 1.25 (1) mol/dm<sup>3</sup> [1]

**[Total: 12]**