

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Ordinary Level

MARK SCHEME for the October/November 2008 question paper

5070 CHEMISTRY

5070/04

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.

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- 1 (a) (i) nitrogen [1]
- (ii) 64 cm^3 [1]
- (iii) $16/80 = 20\%$ [1]
- (b) (i) $2\text{Cu} + \text{O}_2 = 2\text{CuO}$ [1]
- (ii) black [1]
- (c) (i) $0.16/64 = 0.0025$ moles [1]
- (ii) 0.00125 moles [1]
- (iii) 30 cm^3 [1]
- (iv) 150 cm^3 [1]
 (If dm^3 used in both (iii) and (iv) and stated, no deduction.
 If not stated mark lost in (iii) but e.c.f for (iv).)

[Total: 9]

- 2 (a) (i) orange to green [1]
- (ii) oxidising agent etc. [1]
- (iii) sulfur dioxide or hydrogen sulfide [1]
- (iv) propanol, [1]
- (b) (i) propyl propanoate (e.c.f on incorrect alcohol in (a) (iv)) [1]
- (ii) esters [1]
- (iii) sweet or fruity smell (e.c.f for (i) and (ii) on propene only) [1]
- (c) yellow or orange (propanoic acid), red (sulfuric acid) [1]
- (d) (i) gas evolved, effervescence, fizzing, bubbles, Mg dissolves,
 or test-tube gets hot. [1]
- (ii) reaction faster with sulfuric acid [1]
- (e) sulfuric acid is a stronger acid (than propanoic acid) [1]

[Total: 11]

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3 (c) [1]

4 (d) [1]

5 (b) [1]

6 (b) [1]

7 (b) [1]

[Total 3–7: 5]

8 (a) 1.32 g [1]

(b) (i) 106 g [1]

(ii) $1.32 \times 4 / 106 = 0.0498$ (0.05) mol/dm³ [1]

(c) (i) yellow to (ii) orange, red, pink. [1]

(d) titre was too small to obtain accuracy etc [1]

(e) water – first (1) diluted acid or solution H – second (1) [2]

(f)

23.7	40.6	44.2
0	17.5	20.9
23.7	23.1	23.3

Mean value = 23.2 (1) cm³

(1 mark for each correct row or column (3)) [4]

(g) 0.00125 [1]

(h) 0.0025 [1]

(i) $0.0025 \times 1000 / 23.2 = 0.108$ [1]

(j) 1.08 mol/dm³ [1]

(k) Increase the concentration or amount of Na₂CO₃ (1)
by factor of 10 (1) [2]

[Total: 17]

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- 9 (a) Colourless solution (1)
- (b) Al^{3+} (1) and Zn^{2+} (1) (or any correct ion e.g. Pb^{2+})
(If either or both charges are incorrect or missing -1)
- (c) No precipitate or slight white ppt. (1) (not no reaction)
- (d) HNO_3 (not conc) (1) $\text{Pb}(\text{NO}_3)_2$ or AgNO_3 (1)
yellow ppt. (1)
 CaI_2 (1) [8]
- [Total: 8]**
- 10 (a) 29, 49, 21, 18. (1) all correct.
37, 33, 28, 29. (1) all correct.
12, 8, 3, 4. (1) all correct. [3]
- (b) Points connected by a smooth curve [1]
- (c) (i) 10 cm^3 (read candidates graph). (Must show evidence of extending graph). [1]
- (ii) The greater the atomic mass of the element the less moles or amount are/is involved.
(or w.t.t.e) [1]
- (d) Points connected by a series of straight lines (1)
all points plotted correctly in both graphs (1) [2]
- (e) graph does not show any relationship between the two,
not uniform, not a curve or a straight line, or w.t.t.e. [1]
- (f) Copper does not react with hydrochloric acid. [1]
- [Total: 10]**