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

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1 **(a)** **(i)** nitrogen [1]

(ii) 64 cm^3 [1]

(iii) 16/80 = 20% [1]

(b) **(i)** $2Cu + O_2 = 2CuO$ [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]

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 × 4 / 106 = 0.0498 (0.05) mol/dm^3 [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) cm^3

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

(g) 0.00125 [1]

(h) 0.0025 [1]

(i) 0.0025 × 1000 / 23.2 = 0.108 [1]

(j) 1.08 mol/dm^3 [1]

(k) Increase the concentration or amount of Na_2CO_3 (1)
by factor of 10 (1) [2]

[Total: 17]

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) (<u>not</u> no reaction)

(d) HNO_3 (not conc) (1) $Pb(NO_3)_2$ 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 <u>both</u> 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]