CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5070 CHEMISTRY

5070/42 Paper 4 (Alternative to Practical), maximum raw mark 60

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1 **(a)** (gas) syringe (1) [1]

(b) **(i)** hydrogen (1)
burning splint pops **or** pops in a flame (1) [2]

(ii) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$ (1) [1]

(c) **(i)** 0.004 (mol) (1) [1]

(ii) 0.26 (g) (1) [1]

(iii) 0.94 (g) (1) [1]

(d) (copper) wet / not dried / some solution remaining (1) [1]

[Total: 8]

2 **(a)** **(i)** cracking (1) [1]

(ii) catalyst / speeds up reaction (1) [1]

(iii) C_8H_{18} (1) [1]

(iv) C_2H_4 with any one other viable product in a balanced equation (1)
e.g. $C_8H_{18} \rightarrow C_2H_4 + C_6H_{14}$ **or** $2C_2H_4 + C_4H_{10}$
or $3C_2H_4 + C_2H_6$ **or** $4C_2H_4 + H_2$ [1]

(b) **(i)** (turns) colourless / decolourises (1) [1]

(ii) addition (1) [1]

(iii) $C_2H_4 + Br_2 \rightarrow C_2H_4Br_2$ / correct structural formula (1) [1]

(c) carbon dioxide (1)
limewater turns milky or forms a white ppt. (1) [2]

[Total: 9]

3 **(d)** (1) **[Total: 1]**

4 **(b)** (1) **[Total: 1]**

5 **(c)** (1) **[Total: 1]**

6 **(a)** (1) **[Total: 1]**

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7 **(a)** 1.82 (g) (1) [1]

(b) volumetric flask / standard flask / graduated flask (1) [1]

(c) (before) yellow to (after) orange **or** red **or** pink **or** a combination e.g. orange / red (1) [1]

(d)

19.8	29.1	46.7	one mark for each correct row **or** column
0.0	10.0	27.4	to the benefit of the candidate (3)
19.8	19.1	19.3	

mean titre 19.2 (cm^3) (1) [4]

(e) 0.00192 (mol) (1) [1]

(f) $Na_2CO_3 + 2HCl \rightarrow 2NaCl + CO_2 + H_2O$ (1) [1]

(g) 0.00096 (mol) (1) [1]

(h) 0.0096 (mol) (1) [1]

(i) 1.018 **or** 1.02 (g) (1) [1]

(j) 0.8(0) (g) (1) [1]

(k) 44(.0) % (1) [1]

[Total: 14]

8 **(a)** **L** does not contain a transition metal / transition element / transition metal compound / transition metal ions (1) [1]

(b) **(i)** white ppt (1)

(ii) soluble in excess / forms a solution (1) [2]

(c) **(i)** white ppt (1)

(ii) insoluble in excess (1) [2]

(d) (dilute / aqueous) nitric / hydrochloric acid (1)
(aqueous) barium nitrate / chloride / hydroxide (1)
white ppt (1) [3]

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(e) $Al_2(SO_4)_3$ (1) [1]

[Total: 9]

9 **(a)** $2Cu + O_2 \rightarrow 2CuO$ (1) [1]

(b) nitrogen (1) [1]

(c) **(i)** all points plotted correctly (1)
ruled straight line of best fit (1)
passing through the origin (1) [3]

(ii) point at 50, 45 circled (1) [1]

(iii) value in range 39–41 cm^3 only (1) [1]

(iv) gas not been passed until all oxygen is used up / copper has not been heated long enough / there is not enough copper / oxygen in excess / gas is not allowed to cool (1) [1]

(d) **(i)** 20(.0)(cm^3) **allow** correctly read value from candidate's graph (1) [1]

(ii) 44(.0)(cm^3) **allow** correctly read value from candidate's graph (1) [1]

[Total: 10]

10 **(a)** sulfuric acid (1) [1]

(b) $CuO + H_2SO_4 \rightarrow CuSO_4 + H_2O$ (1) [1]

(c) blue (1) [1]

(d) heat / evaporate / warm / boil / leave in sun (1) [1]

to crystallisation point / saturation point / leave some of water / leave solution to cool / leave solution to crystallise / leave a concentrated solution (1) [1]

wash **and** dry crystals (1) [1]

[Total: 6]

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