

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) [2]
burning splint pops **or** pops in a flame (1)
- (ii) $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + \text{H}_2$ (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. $\text{C}_8\text{H}_{18} \rightarrow \text{C}_2\text{H}_4 + \text{C}_6\text{H}_{14}$ **or** $2\text{C}_2\text{H}_4 + \text{C}_4\text{H}_{10}$
or $3\text{C}_2\text{H}_4 + \text{C}_2\text{H}_6$ **or** $4\text{C}_2\text{H}_4 + \text{H}_2$ [1]
- (b) (i) (turns) colourless / decolourises (1) [1]
- (ii) addition (1) [1]
- (iii) $\text{C}_2\text{H}_4 + \text{Br}_2 \rightarrow \text{C}_2\text{H}_4\text{Br}_2$ / 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)
$$\begin{array}{r} 19.8 \quad 29.1 \quad 46.7 \\ \underline{0.0} \quad \underline{10.0} \quad \underline{27.4} \\ \underline{19.8} \quad \underline{19.1} \quad \underline{19.3} \\ \text{mean titre } 19.2(\text{cm}^3) \end{array}$$
 (1) one mark for each correct row **or** column to the benefit of the candidate (3) [4]
- (e) 0.00192(mol) (1) [1]
- (f) $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{CO}_2 + \text{H}_2\text{O}$ (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 cm³ 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)(cm³) **allow** correctly read value from candidate's graph (1) [1]

(ii) 44(.0)(cm³) **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]