**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

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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CAMBRIDGE
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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]**

**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]

**(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]**