**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**GCE Ordinary Level**

# MARK SCHEME for the May/June 2013 series

## 5070 CHEMISTRY

**5070/41** 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.

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

**(b)** turns lime water milky (1) [1]

**(c)** 66 (1) $cm^3$ [1]

**(d)** 0.00275 (1) moles [1]

**(e)** **(i)** 0.0055 (1) moles [1]

**(ii)** 84 (1) [1]

**(iii)** 0.462 (1) g [1]

[Total: 7]

**2** **(a)** brown (1) (orange) [1]

**(b)** **(i)** brown fumes begin to move into the top jar (1) [1]

**(ii)** brown colour fumes throughout both jars OR colour is lighter (1) [1]

**(iii)** evaporation OR diffusion (1) [1]

**(c)** **(i)** $CH_3 – CH = CH – CH_3$ OR $CH_3 – CH_2 – CH = CH_2$ (1)

$CH_3 – C(CH_3) = CH_2$ (1) [2]

**(ii)** molecule contains a double bond (1) [1]

**(d)** **(i)** (pass an alkene through bromine water. If unsaturated) bromine solution turns colourless (1) [1]

**(ii)** $C_4H_8 + Br_2 \rightarrow C_4H_8Br_2$ (1) [1]

[Total: 9]

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

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

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

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

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

**8** **(a)** 4.96 (1) g [1]

**(b)** **(i)** green / colourless to **(ii)** pink (1) [1]

**(c)**

| | | | |
|---|---|---|---|
| 22.8 | 39.7 | 31.3 | |
| 0.0 | 17.5 | 8.9 | 1 mark for each correct row or column to benefit of candidate (3) |
| 22.8 | 22.2 | 22.4 | |

mean titre = 22.3 (1) $cm^3$ [4]

**(d)** 0.000446 (1) moles [1]

**(e)** 0.00223 (1) moles [1]

**(f)** 0.0223 (1) moles [1]

**(g)** 3.39 (1) g [1]

**(h)** 1.57 (1) g [1]

**(i)** 0.087 (1) moles [1]

**(j)** 3.91 (1) [1]

**(k)** **x** = 4 [1]

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**(l)** **(i)** iron(III) sulfate (1) [1]

**(ii)** oxidation / reacts with oxygen in the air (1) [1]

**(iii)** red / brown precipitate (1) [1]

[Total: 17]

**9** **(a)** transition metal present (1)

**(b)** **(i)** blue ppt (1)

**(ii)** insoluble (1)

**(c)** **(i)** blue ppt (1)

**(ii)** dissolves to form a DARK blue solution (1)

**(d)** $HNO_3$ (1) / $AgNO_3$ (1) white ppt (1)

**W** is $CuCl_2$ (1) [Total: 9]

**10** **(a)** exothermic (1) [1]

**(b)** 26.8, 30.2, 33.6, 35.5 (1) all correct

6.8, 10.2, 13.6, 15.5 (1) all correct [2]

**(c)** all points plotted correctly (1)

points joined by two intersecting straight lines (1 mark for each line)

(if lines are connected by a curve, 1 mark from 2)

(line not passing through zero, 1 mark from 2) [3]

**(d)** **(i)** 8.5 $^{o}$C (1) [1]

**(ii)** 32 $^{o}$C (1) [1]

**(e)** all acid has been neutralised (1) [1]

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**(f) (i)** 0.45 (1) g [1]

**(ii)** 0.01875 (1) moles [1]

**(iii)** 0.0375 x 2 = m × 50 / 1000 (1)
m = 0.75 mol / $dm^3$ (1) [2]

[Total: 13]

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