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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
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) $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$ OR $\text{CH}_3 - \text{CH}_2 - \text{CH} = \text{CH}_2$ (1)

$\text{CH}_3 - \text{C} = \text{CH}_2$ (1)

$\text{CH}_3$ [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) $\text{C}_4\text{H}_8 + \text{Br}_2 \rightarrow \text{C}_4\text{H}_8\text{Br}_2$ (1) [1]

[Total: 9]
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) cm³ [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]
(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) HNO₃ (1) / AgNO₃ (1) white ppt (1)

W is CuCl₂ (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 °C (1) [1]
(ii) 32 °C (1) [1]

(e) all acid has been neutralised (1) [1]
<table>
<thead>
<tr>
<th>(f)</th>
<th>(i)</th>
<th>0.45 (1) g</th>
<th>[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ii)</td>
<td>0.01875 (1) moles</td>
<td>[1]</td>
</tr>
<tr>
<td></td>
<td>(iii)</td>
<td>0.0375 x 2 = m × 50 / 1000 (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>m = 0.75 mol / dm³ (1)</td>
<td>[2]</td>
</tr>
</tbody>
</table>

[Total: 13]