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 October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
1 (a) 25 (1) cm³

(b) yellow (1) allow e.g light, dark but not greyish yellow

(c) filtration / centrifuge / decantation (1)

(d) 0.02 (1) moles

(e) 0.02 (1) moles

(f) 0.80 (1) moles
(ecf for (e) and (f) from (d)) [Total: 6]

2 (a) CuO (1) black (1)

(b) CuO + H₂SO₄ → CuSO₄ + H₂O (1)

(c) copper sulfate, blue (1) (both)

(d) zinc dissolves / disappears (1)
   copper / brown / orange / pink / red-brown (not red)
   deposit / residue / metal / substance / powder / solid (1) (both)
   (blue) colour of solution reduces / fades or is lost (1)
   gas evolved / effervescence / fizzing / bubbles (1)
   (not hydrogen evolved) (maximum 3 marks)

(d) silver / gold / platinum / mercury / copper (1) [Total: 8]

3 (a) (i) propanol (1)
   C₃H₇OH / C₃H₈O (1)

(ii) condenser (1)
   (not fractionating column)
   to return unreacted compounds to flask (1)
   (not changes vapour to liquid)

(iii) electric heater – alcohols (reactants) are flammable (1)
   (not dangerous)
(b) (i) 100°C (1)

(ii) thermometer reads or temperature rises to 140°C (1)

*not* just temperature rises

(iii) to prevent build up of pressure or explosion (1)

*not* to allow gas to escape

[Total: 8]

4 (b) (1)

[Total: 1]

5 (b) (1)

[Total: 1]

6 (a) (1)

[Total: 1]

7 (a) (1)

[Total: 1]

8 (a) 1.61 (1) g

(b) pink to colourless (1)

(c) 

<table>
<thead>
<tr>
<th>26.3</th>
<th>29.3</th>
<th>47.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>3.6</td>
<td>21.6</td>
</tr>
<tr>
<td>26.3</td>
<td>25.7</td>
<td>25.5</td>
</tr>
</tbody>
</table>

1 mark for each correct row or column (3)

mean value = 25.6(1) cm³

(d) 0.00256 (1) moles (0.0026 loses mark)

(e) \( \text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O} \) (1)

(f) 0.00256 (1) moles

(g) 0.0256 (1) moles

(h) 0.05 (1) moles

(i) 0.0244 (1) moles
(j) 0.0122 (1) moles

(k) 132 (1)

(l) 132 – 90 (1) = 42
  hence C₃H₆ / x = 3, y = 6 (1)

  ecf throughout and for values of y in (k) [Total: 16]

9 (a) transition metal ions / transition metal present (1)
  not M is a transition metal / it is a transition metal / transition metal on its own

  (b) (i) green ppt (1)

    (ii) ppt insoluble in excess (1)

    (iii) ammonia evolved (1) gas turns litmus blue (1)
  or ammonia turns litmus blue (2)

  (c) BaCl₂ or Ba(NO₃)₂(1) with HCl or HNO₃ (1) white ppt (1)

  omission of Ba salt in test = 0 marks

  use of sulfuric acid or sulfates = 0 marks [Total: 8]

10 (a) all points plotted correctly (1)
  smooth curve through the points (1)

  (b) (i) 13 (1)

    (ii) 7(1)

    (iii) 27.5 cm³ (1)

  (c) (i) H₂SO₄ + 2NaOH → Na₂SO₄ + 2H₂O (1)

    (ii) 0.455 (allow 0.45 or 0.46 dm³) (1)

  (d) heat / evaporate / boil / leave in sun (1)

  to crystallisation point / saturation point / evaporate some of water / leave solution to cool / leave to crystallise / leave on its own (1)

  wash and dry crystals (1) [Total: 10]