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) (i) set B accept: D or B and D  
   (ii) arrow positioned anywhere towards liquid
(b) effect bung shoots out/test-tube cracks/shatters/explodes  
   reference to pressure
(c) diagram showing delivery tube into trough with water and collecting vessel  
   labelled
   note: gas syringe = 0

2 (a) hydrogen
(b) volumes completed correctly
   0 18 30 40 43 54 58 60
   –1 for each incorrect  
   ignore extra decimal place e.g. 43.00
(c) points plotted correctly
   smooth curve
   –1 for each incorrect
(d) (i) point at 4 minutes off curve
   (ii) 47 – 49 ignore units
   indication on graph
(e) magnesium powder/higher temperature/more concentrated acid/catalyst used  
   faster/more surface area/more collisions
3 (a) initial readings
   0.0  17.5  8.9

   final readings
   23.8  40.7  32.3 (2), –1 any incorrect

   differences
   23.8  23.2  23.4 (1)

(b) titration 2 and 3/23.2 and 23.4 (1)
   average = 23.3 (1)

   allow: ecf for calculation of average

(c) pipette/burette (1)

(d) blue to red/pink (1)

(e) (i) half as much acid S/twice as much HCl (1)
(ii) \( y = 2 \) (1)

4 tests on filtrate

(a) (i) white (1) precipitate (1) with excess does not dissolve/clear (1)
(ii) no precipitate/very slight precipitate/no reaction
(iii) white (1) precipitate (1)

(c) carbon dioxide/\( \text{CO}_2 \) (1)

(d) lead/silver (1) carbonate (1)

5 (a) Temperature boxes completed correctly (2), –1 for each incorrect
   25  31  37  42  48  48  48
   Temperature rises calculated correctly (1)
   0  6  12  17  23  23  23
(b) all points correctly plotted (3), –1 for any incorrect 
   smooth straight line graphs drawn with a ruler (1) 
   labels (1) [5]

(c) (i) value from graph (1) 0.50 – 0.52 g allow: 0.5 g ignore units [1]
   (ii) value from graph (1) 8.5 – 9.0 °C [1]
       allow: 9 °C ignore units

(d) 0.8 g (1) [1]

(e) zinc (1) [2]
   temperature stays same when increasing amounts added/no more heat given off/no further reaction (1)

(f) no temperature changes (1) does not react owtte (1) [2]

6 any 7 from: [7]
   known mass or volume of fats/oil (1)
   add organic solvent (1)
   shake/stir (1)
   add drops of bromine water (1)
   until orange colour seen (1)
   read and record volume/number of drops (1)
   compare oils (1)
   conclusion (1)

[Total: 60]