UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2011 question paper

for the guidance of teachers

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 26 (1) cm^3 [1]

2 **(a)** red to blue (1)

 (b) **(i)** hydrogen (1) pops in a flame (1)

 (c) **(i)** effervescence or fizzing or bubbles given off (1)
            Not gas evolved

   (ii) carbon dioxide (1) turns lime water milky or white (1)
            ecf on O_2 [6]

3 **(a)** 0.48 (1) g

 (b) **(i)** silver/grey/shiny metal/solid (1)

   (ii) white solid/powder (1)

 (c) to ensure constant weight or that reaction was complete (1)

 (d) **(i)** 0.8 (1) g

   (ii) 0.32 (1) g

 (e) 0.48/24 = 0.02   0.32/16 = 0.02 (1)
         MgO (1)

 (f) **(i)** MgO + 2HCl → MgCl_2 + H$_2$O (1)
                or + H$_2$SO$_4$ + HNO$_3$

   (ii) basic (1)   [10]

4 (c) (1)   [1]

5 (b) (1)   [1]

6 (d) (1)   [1]

7 (d) (1)   [1]

8 (b) (1)   [1]

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9 **(a)** 1.22 (1) g

(b) to allow gas/carbon dioxide to escape (1)

(c) red/pink to yellow (1)

(d)

24.1	41.1	28.5	1 mark for each correct row or column (3)
0.0	17.6	4.8	
24.1	23.5	23.7	

Mean value = 23.6 (1) cm^3

(e) 0.00236 (1)

(f) 0.00236 (1)

(g) 0.0236 (1)

(h) 0.05 (1)

(i) 0.0264 (1)

(j) $MgCO_3$ + $2HCl$ → $MgCl_2$ + CO_2 + H_2O (1)

(k) 0.0132 (1)

(l) **(i)** 84 (1)

  (ii) 1.11 (1) g

  (iii) 1.11/1.22 = 91% (1)   [17]

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10 (a) transition metal or transition metal ions present (1)

   (b) (i) blue ppt (1)

      (ii) insoluble in excess (1)

   (c) (i) blue ppt (1)

      (ii) soluble forming a DEEP blue solution (1)

   (d) HNO_3/$AgNO_3$ (2)
     White ppt (1)
     $CuCl_2$ (1)   [9]

11 (a) 26.8, 28.5, 30.3, 31.2 (1) all correct
     1.8, 3.5, 5.3, 6.2 (1) all correct

   (b) all points plotted correctly (1)
     two intersecting straight lines, the first of which must pass
     through zero (2).
     points joined by a curve or a series of straight lines at intersection (1)

   (c) (i) 0.34 (1) g

      (ii) 0.70 (1) g

      (iii) Fe + $CuSO_4$ → $FeSO_4$ + Cu (1)

      (iv) redox or displacement or exothermic (1)

      (v) $50 \times conc^n$ / 1000 = 0.70/56 (1)
         $Conc^n$ = 0.25 (1) mol/dm^3

   (d) blue colour disappears
     or red deposit/solid/copper at bottom of beaker (1)   [12]

     [with all graphical answers please read candidate's graph and to accuracy of ± half small
     square]