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Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

5070 CHEMISTRY

5070/42 Paper 4 (Alternative to Practical), maximum raw mark 60

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1 **(a)** measuring cylinder (1) [1]

(b) 26 (1) cm^3 [1]

(c) **(i)** (turns) red (1) [1]

(ii) bubbles/effervescence **OR** solid dissolves / disappears / forms a solution (1) [1]

(d) propanol / propan-1-ol (1) [1]

(e) ethyl propanoate (1)
$C_2H_5COOC_2H_5$ or $C_2H_5CO_2C_2H_5$ (1) [2]

[Total: 7]

2 **(a)** hydrogen / H_2 **NOT** H (1)
burning splint pops or pops in a flame (1) [2]

(b) $Mg + 2HCl \rightarrow MgCl_2 + H_2$ (1) [1]

(c) final temperature 35.2
initial temperature 26.3
change in temperature 8.9
all three correct scores 2 marks; two correct scores 1 mark [2]

(d) exothermic (1) [1]

[Total: 6]

3 **(a)** limewater turns milky (1) [1]

(b) heat to constant mass (1) [1]

(c) **(i)** 0.16 (1) g [1]

(ii) 0.004 (1) moles [1]

(iii) 0.004 (1) moles [1]

(iv) 40 (1) [1]

(v) ((**iv**) – 16) = 24 (1) [1]

[Total: 7]

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

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

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

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

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

9 **(a)** 3.35 (1) g [1]

(b) volumetric flask (1) [1]

(c) **(i)** pipette (1) [1]

(ii) yellow to red / orange / pink (1) [1]

(d)

23.8	47.8	33.3	1 mark for each correct row or column
0.0	24.3	10.0	to the benefit of the candidate (3)
23.8	23.5	23.3	

average volume of 0.100 mol / dm^3 HCl = 23.4 (1) cm^3 [4]

(e) 0.00234 (1) moles [1]

(f) 0.00117 (1) moles [1]

(g) 0.0117 (1) moles [1]

(h) 286 (1) [1]

(i) **(h)** – 106 (1)
x = (answer / 18 =) 10 (1)
answer need not be a whole number but may be rounded up to a whole number [2]

[Total: 14]

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10 (a) (**Z** is a) compound of a transition metal or transition element or **Z** contains transition metal ions (1)

(b) (i) green ppt (1)

(ii) insoluble (1)

(c) (i) green ppt (1)

(ii) insoluble (1)

(d) (dilute) hydrochloric or nitric acid (1)
aqueous barium chloride or nitrate (1)
white ppt (1)

Conclusion: The formula for **Z** is $FeSO_4$. (1)

[Total: 9]

11 (a) gas escapes / lost from apparatus (1) [1]

(b) to allow the gas / vapour to escape (1)
to prevent the liquid from splashing out **OR** to prevent an explosion / flask from bursting / pressure build up / to release the pressure (1) [2]

(c) all points plotted correctly (1)
two smooth curves drawn (1)
curves pass through all points (1) [3]

(d) (i) 0.46(5) (1) g [1]

(ii) 89.55 – 89.47 (1) = 0.08 (1) g [2]

(iii) manganese (IV) oxide: graph is steeper (at the start) in experiment 1 (1) [1]

(e) all the hydrogen peroxide is used up or has reacted (1) [1]

(f) 89.45 (1) g [1]

[Total: 12]

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