CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2014 series

5070 CHEMISTRY

5070/41 Paper 4 (Alternative to Practical), maximum raw mark 60

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1 **(a)** **(i)** $2Cu + O_2 \rightarrow 2CuO$ (1) [1]

(ii) black (1) [1]

(b) **(i)** 72 (1) cm^3 [1]

(ii) nitrogen (1) [1]

(iii) 18 (1) cm^3 [1]

(iv) 0.00075 (1) moles [1]

(v) 0.096 (1) g [1]

(c) 300 (1) cm^3 [1]

[Total: 8]

2 **(a)** **(i)** red / pink (1) [1]

(ii) hydrochloric acid (1) [1]

(iii) Universal indicator / pH meter / full range indicator (1) [1]

(b) **(i)** diffusion (1) [1]

(ii) ammonium chloride **AND** NH_4Cl (1) [1]

(iii) **C** (1)

Explanation
Ammonia molecules move or diffuse faster (than HCl molecules), or reverse (1)

Ammonia has lower density <u>than HCl</u> / lower M_r <u>than HCl</u> / ammonia molecules are lighter <u>than HCl molecules</u>, or reverse (1)

If density of gases are compared to air, both densities must be stated e.g. ammonia lighter than air AND hydrogen chloride heavier than air. [3]

(c) **Y** (NH_3) (1); **X** (HCl) (1)

<u>Both</u> soluble in water (1)
HCl is more dense than air **AND** NH_3 is less dense than air (1) [4]

[Total: 12]

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

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

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

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

7 (a) 1.70 (1) g [1]

(b) carbon dioxide (1) turns lime water milky / white ppt (1) [2]

(c) pink / red to yellow (1) [1]

(d)

25.9	48.6	32.4	(1)	1 mark for each correct
0.0	23.3	6.9	(1)	row or column to the benefit of the candidate (3)
25.9	25.3	25.5	(1)	

Mean value 25.4 (1) cm^3 [4]

(e) 0.00254 (1) moles [1]

(f) 0.00254 (1) moles [1]

(g) 0.0254 (1) moles [1]

(h) 0.05 (1) moles [1]

(i) 0.0246 (1) moles [1]

(j) 0.0123 (1) moles [1]

(k) 138 (1) 39 (1) [2]

[Total: 16]

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8 **(a)** Transition metal ion / compound may be present (1)

(b) **(i)** green precipitate (1)

(ii) precipitate insoluble (1)

(iii) **gas** evolved that turns damp red litmus blue (1)
ammonia (1)

(c) $BaCl_2$ or $Ba(NO_3)_2$ or names(1)
HCl or HNO_3 or names(1)
white ppt (1)

[Total: 8]

9 **(a)** yellow (1) [1]

(b) 0.64, 1.27, 1.91, 2.35, 2.35, 2.35 all correct (1) [1]

(c) all points plotted correctly (1)
two straight lines, one of which must go through zero (1)
lines intersect (1) [3]

(d) **(i)** 3.2 (1) cm^3 [1]

(ii) 2.35 (1) g [1]

(iii) 7.4 (1) cm^3 [1]

All answers in (d) must come from the candidate's graph. Read candidate's graph to +/– half a small square.

(e) $AgNO_3 + KI \rightarrow AgI + KNO_3$ (1) [1]

(f) 1.35 (1) mol / dm^3 [1]

(g) M_r $AgCl$, 143.5 (1)
Mass of $AgCl = 1.435$ (1) g [2]

[Total: 12]

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