CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the May/June 2015 series

5070 CHEMISTRY

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

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1 **(a)** **(i)** Silver / grey solid (1) [1]

(ii) $2Zn + O_2 = 2ZnO$ (1) [1]

(iii) Nitric acid / HNO_3 (1) [1]

(b) **(i)** Toxic / poisonous gas evolved (1) [1]

(ii) 3.78 / 189 = 0.02 (1) [1]

(iii) $0.02 \times 24000 \times 2 = 960\,cm^3$ (1)
$0.02 \times 24000 \times 0.5 = 240\,cm^3$ (1) [2]

[Total: 7]

2 **(a)** 88 – 45 = 43 (1)
n = 3 (1)

butanoic acid / butyric acid (1) [3]

(b) hydrogen (1)
pops in flame / burning splint pops / lighted splint pops (1) [2]

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

(ii) $CH_3COOC_2H_5$ / $CH_3CO_2C_2H_5$ (1) [1]

(iii) ethanol (1) ethanoic acid (1) [2]

(iv) $C_2H_5COOCH_3$(1) / methyl propanoate (1)

OR $HCOOC_3H_7$(1) / propyl methanoate (1) [2]

[Total: 11]

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

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

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

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

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

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8 **(a)** Gas no longer turns litmus blue (1) [1]

(b) Pink to colourless (1) [1]

(c)

29.5	28.8	39.9	1 mark for each correct row or column
8.9	7.9	19.5	to the benefit of the candidate (3)
20.6	20.9	20.4	

Mean value 20.5 cm^3 (1) [4]

(d) 0.00205 moles (1) [1]

(e) **(i)** 0.00205 (1) [1]

(ii) 0.0205 (1) [1]

(f) 0.1 (1) [1]

(g) 0.0795 (1) [1]

(h) **(i)** 1.352 g (1) [1]

(ii) 54.06 g (1) [1]

(i) One mole of $(NH_4)_2SO_4$ produces 34 g / 2 moles of ammonia (1)
Concentration = 54.06 / 34 = 1.59 mol / dm^3 (1) [2]

[Total: 15]

9 **(a)** colourless solution (1)

(b) **(i)** white ppt (1)

(ii) soluble in excess (1)

(c) **(i)** white ppt (1)

(ii) insoluble in excess (1)

(d) M1 (aq) NaOH / sodium hydroxide/ (1)
M2 A*l* / aluminium (foil) / Devarda's alloy (1)
M3 warm / heat / boil (1)
M4 ammonia / NH_3 **OR** **gas** turns litmus blue (1)

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ALLOW
Brown ring test: conc. (1) sulfuric acid / H_2SO_4 (1) iron(II) sulfate / $FeSO_4$ (1) brown ring (1)

[Total: 9]

10 (a) 10, 36, 54, 68
All correct for two marks; three correct for one mark [2]

(b) Temperature at which solid appears is below room temperature (1)
Cooling the tube by some method e.g. ice (1) [2]

(c) all points plotted correctly (1)
two smooth curves through the points (1 mark for each) [3]

(d) (i) NH_4Cl – 2.8 (1) [1]

(ii) KNO_3 – 1.7 (1) [1]

(e) (i) 23 (1) [1]

(ii) 3.4 g / 10g = 34 g / 100 g water (1) [1]

(f) NH_4Cl – solution + undissolved solid (1)
KNO_3 – solution (no solid) (1) [2]

[Total: 13]

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