

**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) $2\text{Zn} + \text{O}_2 = 2\text{ZnO}$ (1)	[1]
	(iii) Nitric acid/ $\text{HNO}_3$ (1)	[1]
	(b) (i) Toxic/poisonous gas evolved (1)	[1]
	(ii) $3.78/189 = 0.02$ (1)	[1]
	(iii) $0.02 \times 24000 \times 2 = 960 \text{ cm}^3$ (1) $0.02 \times 24000 \times 0.5 = 240 \text{ cm}^3$ (1)	[2]
		<b>[Total: 7]</b>
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) $\text{CH}_3\text{COOC}_2\text{H}_5$ / $\text{CH}_3\text{CO}_2\text{C}_2\text{H}_5$ (1)	[1]
	(iii) ethanol (1) ethanoic acid (1)	[2]
	(iv) $\text{C}_2\text{H}_5\text{COOCH}_3$ (1)/methyl propanoate (1) <b>OR</b> $\text{HCOOC}_3\text{H}_7$ (1)/propyl methanoate (1)	[2]
		<b>[Total: 11]</b>
3	(d)	<b>[Total: 1]</b>
4	(b)	<b>[Total: 1]</b>
5	(b)	<b>[Total: 1]</b>
6	(b)	<b>[Total: 1]</b>
7	(b)	<b>[Total: 1]</b>

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- 8 (a) Gas no longer turns litmus blue (1) [1]
- (b) Pink to colourless (1) [1]
- (c)  $\begin{array}{ccc} 29.5 & 28.8 & 39.9 \\ \underline{8.9} & \underline{7.9} & \underline{19.5} \\ \underline{20.6} & \underline{20.9} & \underline{20.4} \end{array}$  1 mark for each correct row or column to the benefit of the candidate (3)
- Mean value  $20.5 \text{ cm}^3$  (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) 1.352g (1) [1]
- (ii) 54.06g (1) [1]
- (i) One mole of  $(\text{NH}_4)_2\text{SO}_4$  produces 34 g/2 moles of ammonia (1)  
Concentration =  $54.06/34 = 1.59 \text{ mol/dm}^3$  (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 Al/ aluminium (foil)/ Devarda's alloy (1)  
M3 warm/heat/boil (1)  
M4 ammonia/ $\text{NH}_3$  **OR gas** turns litmus blue (1)

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**ALLOW**Brown ring test: conc. (1) sulfuric acid /  $\text{H}_2\text{SO}_4$  (1) iron(II) sulfate /  $\text{FeSO}_4$  (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)**  $\text{NH}_4\text{Cl}$  – 2.8 (1) [1]  
**(ii)**  $\text{KNO}_3$  – 1.7 (1) [1]
- (e) (i)** 23 (1) [1]  
**(ii)**  $3.4\text{ g} / 10\text{ g} = 34\text{ g} / 100\text{ g}$  water (1) [1]
- (f)**  $\text{NH}_4\text{Cl}$  – solution + undissolved solid (1)  
 $\text{KNO}_3$  – solution (no solid) (1) [2]

**[Total: 13]**