

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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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5070	41

- 1 (a) (i) Silver/grey solid (1) [1]
- (ii) $2\text{Zn} + \text{O}_2 = 2\text{ZnO}$ (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) $0.02 \times 24000 \times 2 = 960 \text{ cm}^3$ (1) [2]
 $0.02 \times 24000 \times 0.5 = 240 \text{ cm}^3$ (1)
- [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) $\text{CH}_3\text{COOC}_2\text{H}_5$ / $\text{CH}_3\text{CO}_2\text{C}_2\text{H}_5$ (1) [1]
- (iii) ethanol (1) ethanoic acid (1) [2]
- (iv) $\text{C}_2\text{H}_5\text{COOCH}_3$ (1)/methyl propanoate (1)
 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]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5070	41

- 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 <u>or</u> column to the benefit of the candidate (3)
<u>8.9</u>	<u>7.9</u>	<u>19.5</u>	
<u>20.6</u>	<u>20.9</u>	<u>20.4</u>	

Mean value 20.5 cm³ (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 (NH₄)₂SO₄ produces 34 g / 2 moles of ammonia (1)
Concentration = 54.06 / 34 = 1.59 mol / dm³ (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 / NH₃ **OR gas** turns litmus blue (1)

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5070	41

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) $3.4 \text{ g} / 10 \text{ g} = 34 \text{ g} / 100 \text{ g water}$ (1)

[1]

(f) NH_4Cl – solution + undissolved solid (1)

KNO_3 – solution (no solid) (1)

[2]

[Total: 13]