

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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MARK SCHEME for the October/November 2013 series

5070 CHEMISTRY

5070/42

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

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Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2013	5070	42

- 1 (a) 28, 23 (1) 5 (1) [2]
- (b) (i) exothermic (1) [1]
- (ii) vertical line labelled ΔH must go to same level as products (1)
horizontal line below reactant line, ignore any labelling (1)
(horizontal line above reactant line i.e. endothermic, 1st mark only can score.) [2]
- (c) (i) blue (ignore any initial colour) (1) [1]
- (ii) pH meter/pH or universal indicator/pH paper (1) [1]
- (iii) 10–14 (1) [1]
- [Total: 8]**
- 2 (a) nitric (acid), HNO_3 (1) (both) [1]
- (b) heat/warm/evaporate/boil/leave in sun (1)
to crystallisation point/saturation point/evaporate some (but not all) of the water/
leave solution to cool/leave to crystallise (1)
wash and dry crystals (1) [3]
- (c) (i) molar mass of $\text{NH}_4\text{NO}_3 = 80$ (1)
 $28/80 \times 1000 = 350(\text{g})$ (1) [2]
- (ii) $(350/28) \times 24 = 300(\text{dm}^3)$ (1) [1]
- (d) ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$ (1)(both) [1]
- (e) NH_4^+ (1)
warm with (aq) NaOH (1)
 NH_3 turns litmus blue OR gas turns litmus blue (1) [3]
- [Total: 11]**
- 3 (b) (1) [Total: 1]
- 4 (d) (1) [Total: 1]
- 5 (a) (1) [Total: 1]
- 6 (b) (1) [Total: 1]

Page 3	Mark Scheme	Syllabus	Paper
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- 7 (a) 1.65(g) (1) [1]
- (b) (i) (to prevent) oxidation of Fe^{2+} ions or to prevent Fe^{2+} being converted to Fe^{3+} /
Fe(III) (1) [1]
- (ii) hydrogen (1)
- pops in a flame/lighted splint (1) [2]
- (c) (i) green/colourless (1)
- (ii) purple/pink (1) [2]
- (d) 27.8 32.1 47.3 1 mark for each correct
0.0 5.7 20.7 row or column to
27.8 26.4 26.6 benefit of candidate (3)
- mean titre = 26.5 (1) cm^3 [4]
- (e) 0.00053 (moles) (1) [1]
- (f) 0.00265 (moles) (1) [1]
- (g) 0.0265 (moles) (1) [1]
- (h) 1.484 (g) (1) [1]
- (i) 89.7–90.0(0)(%)(1) [1]
- [Total: 15]**

- 8 (a) colourless solution (1)
- (b) (i) white ppt (1) soluble in excess(1)
- (c) (i) white ppt , insoluble in excess (1) (both)
- (d) $\text{Ba}(\text{NO}_3)_2$ or BaCl_2 (1) + HCl or HNO_3 (1)
(incorrect formula negates correct name and vice versa)
white ppt (1) (dependent on use of barium salt)
conclusion $\text{Al}_2(\text{SO}_4)_3$ (1) [8]
- [Total: 8]**

Page 4	Mark Scheme	Syllabus	Paper
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- 9 (a) carbon/graphite/platinum (1) [1]
- (b) E or negative or cathode (1) [1]
- (c) a gas is evolved/oxygen gas evolved/bubbles/effervescence/fizzing (1) [1]
- (d) (i) 1.5, 2.0, 2.25, 2.25, 2.25 (1) all correct. [1]
- (ii) all points plotted correctly (1)
two intersecting straight lines (2) (1 mark for one straight line) [3]
- (iii) 32 (min) (1) [1]
- (iv) 45 (min) (1) [1]
- (e) (i) blue (1) [1]
- (ii) colourless (1) [1]
- (f) sloping line continues in a straight line upwards all the way to t = 70, labelled S(1). [1]
- (g) blue (all shades but not combinations such as greeny blue etc.)(1)
concentration of Cu/Cu(II)/Cu²⁺ ions remains constant
OR concentration of electrolyte remains constant
OR explanation based on copper/copper ions being removed and deposited into the solution (1) [2]

[Total: 14]