

## MARK SCHEME for the May/June 2008 question paper

### 5070 CHEMISTRY

5070/04

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

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

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Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2008	5070	04

- 1 Volume mark on lower end (or wrong end) of pipette (1)  
(or any reasonable answer) [1]
- 2 (a) 4.04 (1) g
- (b) white (1) powder (1)
- (c) (i) 1.52 (1) g  
(ii) 2.52 (1) g
- (d) (i) 106  
(ii) 18 (1) both
- (e) (i) 0.0143 (1) moles (0.014 loses mark)  
(ii) 0.140 (1) moles
- (f)  $0.140 / 0.0143 = 9.80$  (1)  $\times = 10$  (1)  
(use of 0.014 from (e)(i) can gain both marks so long as working is shown for answer of 10) [10]
- 3 (a) (i) chlorine (1)  
(ii) decolourises, colour fades, disappears, bleaches (1)  
(iii) chlorine decolourises, bleaches etc. litmus (1)
- (b) (i) hydrogen (1)  
(ii) pops in a flame (1) no glowing splints or burning of hydrogen to get a 'pop'.  
(iii) turns blue (1)  
(iv) excess of hydroxide ions or wtte. (1)  
(a)(i) and (b)(i) reversed may still get remaining appropriate marks in each section.  
Oxygen stated in either (a)(i) or (b)(i) is incorrect but may get an ecf on correct test only.
- (c) hydrochloric acid or HCl (1)
- (d) molten or fused (1) [9]
- 4 to 8 (d), (c), (d), (d), (b) 1 mark each. [5]

Page 3	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2008	5070	04

9 (a) pipette (1)

(b) appropriate test e.g. white fumes with conc. HCl. (1), or litmus turns blue.

(c) (i) yellow

(ii) orange, pink, or red (1) (both)

(d) 

27.2	47.8	30.2
0.0	21.4	3.6
27.2	26.4	26.6

 (1 mark for each correct row **OR** column (3))  
Mean value 26.5 (1) cm<sup>3</sup>

(e) 0.00212 (1)

(f) 0.00212 (1)

(g) 0.0212 (1)

(h) 0.05 (1)

(i) 0.0288 (1)

(j) (i) 0.0288 (1)

(ii)  $0.0288 \times 40 = 1.152 \text{ mol/dm}^3$

[14]

10 (a) colourless (solution) (1)

(b) Al<sup>3+</sup> and Zn<sup>2+</sup> and Pb<sup>2+</sup> or names of ions (any 2) (2)  
(ignore charges)  
Incorrect elements +1/-1

(c) Al<sup>3+</sup> or Pb<sup>2+</sup> (1) (no e.c.f. on Ca)

(d) NaOH (1) Al (1) warm (1) ammonia produced or gas turns red litmus blue (1)  
(must show presence of both Al and NaOH to get observation mark).  
(Al and NaOH may score on own, not heat)  
Al(NO<sub>3</sub>)<sub>3</sub> or Pb(NO<sub>3</sub>)<sub>2</sub> or e.c.f. for Zn(NO<sub>3</sub>)<sub>2</sub> (1)  
Formula must be correct.

[9]

<b>Page 4</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>GCE O LEVEL – May/June 2008</b>	<b>5070</b>	<b>04</b>

**11 (a)**  $\text{Pb}(\text{NO}_3)_2 + 2\text{KI} \rightarrow \text{PbI}_2 + 2\text{KNO}_3$   
correct formulae (1) balanced (1)

**(b)** 8.0(+/- 0.5), 16.0, 24.0, 28.0, 28.0  
all correct (2), one error (1), more than 1 error, 0 marks.

**(c)** All (candidate's) points correctly plotted (1)  
two intersecting lines (2)  
(Point's joined by a curve, 1 mark, points joined by a series of st. lines 0 marks)

**(d) (i)** 7.0 cm<sup>3</sup> (1)

**(ii)** moles Pb(NO<sub>3</sub>) : moles KI = 1:2  
concentration of KI = 3.5 mol/dm<sup>3</sup>  
Correct answer with working (2)  
(evidence of some correct working (1))  
Mole ratio of 1:1 gives 1.75 mol/dm<sup>3</sup>

**(e) (i)** 3.5 (1) cm<sup>3</sup> (half of answer **(d)(i)**)

**(ii)** 28 mm (1)

[12]

**[Total: 60]**