

## 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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- 1 Volume mark on lower end (or wrong end) of pipette (1)  
(or any reasonable answer)
- 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]

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- 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	(1 mark for each correct row <b>OR</b> column (3))
0.0	21.4	3.6	
27.2	26.4	26.6	

  
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]

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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)  
(Points 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  $\text{Pb}(\text{NO}_3)_2$  : moles  $\text{KI} = 1:2$   
concentration of  $\text{KI} = 3.5 \text{ mol/dm}^3$   
Correct answer with working (2)  
(evidence of some correct working (1))  
Mole ratio of 1:1 gives  $1.75 \text{ mol/dm}^3$

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

(ii) 28 mm (1)

[12]

[Total: 60]