

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2006 question paper**

**0652 PHYSICAL SCIENCE**

**0652/06** Paper 6 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and students, 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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

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- 1 (a) (i) carbon dioxide or CO<sub>2</sub> [1]  
(ii) lime-water, goes cloudy/white (precipitate)  
if an incorrect gas is named in (a)(i) a correct test for that gas  
must be given [1]
- (b) (i) 35.8 g, 39.2 g (no tolerance)(if given in wrong order 1 mark only) [2]  
(ii) 3.4g (ecf) [1]
- (c) bubbling stops OWTTE (reject, all the solid has dissolved : any  
answers based on use of an indicator) [1]
- (d) (i) 26.2 g, 1.7 g (no tolerance)  
(if written in the wrong spaces 1 mark only) [2]  
(ii) 24.5 g (ecf) [1]
- (e) 24.5 / 10 = 2.45g calcium carbonate (ecf) (1) [1]

**Total 10 marks**

- 2 (a) 12 mm, 63 mm: 17 mm, 60 mm (+/- 1 mm) [4]
- (b) (i) axes correct & labelled (1)  
all points plotted accurately (+/- 1 mm)(1)  
straight line drawn cutting the y-axis (1)  
(no marks for graph of y (or x) against reading number) [3]
- (ii) 72 mm +/- 2 mm (answer checked with candidate's graph)  
(no marks for answers given in centimetres) [1]
- (iii) line correctly drawn (+/- 1 mm) **and** point **M** labelled (ecf) [1]
- (c) the weight of the card is not acting at point N/  
N is not the centre of mass/  
one side of the card is heavier than the other OWTTE [1]

**Total 10 marks**

**3 (a)**

	sodium carbonate	ammonium chloride	aqueous ammonia
acid	√		√
base		√	
salt	√		√

4 (or 5) correct (2) 2 or 3 correct (1) 1 or 0 (0)

**[2]**

(note that if more than 4 ticks are shown, the number of wrong answers is subtracted from the number of correct answers)

**(b)** solid B is an acid/solid C contains a metal/solid A is not an acid/solid B produces carbon dioxide/other suitable conclusion

**[1]**

**(c) (i)** (moist) (red) litmus (Universal Indicator)(paper) (1)  
is turned blue(purple)/other suitable test for ammonia (1)

**[2]**

**(ii)** solid A is a base (alkali)

**[1]**

**(d) (i)** neutralisation/ammonia is neutralised/exothermic/salt formation

**[1]**

**(ii)** metal (zinc) hydroxide (zinc need not be named for the mark)  
(accept aluminium)(reject metals giving a coloured hydroxide)

**[1]**

**(e) (i)** add barium chloride (nitrate) (and hydrochloric (nitric) acid)  
(the addition of acid need not be mentioned)

**[1]**

**(ii)** white solid/white precipitate seen

**[1]**

**Total 10 marks**

Page 4	Mark Scheme	Syllabus	Paper
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- 4 (a) when the syringe reads a measured volume ( $100\text{cm}^3$ ), start the clock (both statements are required for the mark) [1]
- (b)  $18, 43\text{ cm}^3$  (no tolerance) [2]
- (c)  $\text{CH}_4 = 16, \text{Cl}_2 = 71$  (both correct) [1]
- (d) suitable named metal + hydrochloric or sulphuric acid /electrolysis of suitable named electrolyte (reject "metal + acid") [1]
- (e) (i) B [1]  
(ii) the lower the rmm the faster the flow **or** the higher the rmm the slower the flow (1) names and/or figures from the table used (1) [2]
- (f) no naked flame (1) hydrogen (methane) is flammable/explodes (1) **or** ventilate laboratory/use fume cupboard/do not inhale chlorine (1) chlorine is poisonous (1) reason must match safety precaution do not award mark for use of laboratory clothing, goggles, or other precaution not directly connected with the experiment [2]

**Total 10 marks**

- 5 (a)  $73, 97^\circ\text{C}$ , (2)  $67, 73\text{ cm}^3$  (2) no tolerance [4]
- (b) sensible scale chosen and axes labelled (1) points plotted (1)  $\pm 1^\circ\text{C}$  and  $1\text{cm}^3$  best straight line drawn (1) [3]
- (c) when heated molecules have more energy (1) molecules collide (with walls) (bounce) (or with each other) with greater force (reject "vibrate")(1) collisions (between molecules) occur more often (1) volume or pressure is raised (1) any 2 points [2]
- (d) gas changes state/becomes liquid/solid (on cooling) [1]

**Total 10 marks**

Page 5	Mark Scheme	Syllabus	Paper
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- 6 (a) 52.5, 48.8, 47.3, 50.0 (must say 50.0) no tolerance [4]
- (b) B and C (1), D, A (in correct order) (1) [2]
- (c) C, B (in correct order) ecf from (b) [1]
- (d) hydrocarbon will burn in air with a yellow (smoky) flame  
 alcohol burns with a blue flame  
 alcohol reacts with (conc) sulphuric acid  
 alcohol will form an ester  
 alcohol will react with sodium/other suitable suggestion (any 1) [1]
- (e) add silver nitrate (solution) (1), white precipitate (1)  
 OR yellow (orange) (1) flame test (1) [2]

**Total 10 marks**