#### UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

## MARK SCHEME for the November 2004 question paper

#### 0620 CHEMISTRY

0620/06

Paper 6 (Alternative to Practical), maximum 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 initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

• CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the November 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.



**Grade thresholds** taken for Syllabus 0620 (Chemistry) in the November 2004 examination.

|             | maximum           | minimum mark required for grade: |    |    |    |  |  |
|-------------|-------------------|----------------------------------|----|----|----|--|--|
|             | mark<br>available | А                                | С  | E  | F  |  |  |
| Component 6 | 60                | 46                               | 37 | 29 | 23 |  |  |

The threshold (minimum mark) for B is set halfway between those for Grades A and C. The threshold (minimum mark) for D is set halfway between those for Grades C and E. The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.

Grade A\* does not exist at the level of an individual component.

#### November 2004

### **INTERNATIONAL GCSE**

# MARK SCHEME

**MAXIMUM MARK: 60** 

**SYLLABUS/COMPONENT: 0620/06** 

CHEMISTRY
Alternative to Practical

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Syllabus Paper

| r age r                                   | IGO  |  |  |   | 0620   | 6  |  |
|---|--|--|--|---|--|--|--|
| (a) A measuring                           | g cylinder (   | 1)   |  |   |  |  |  |
| B flask (1)                               |  |  |  |   |  |  | (2)  |
| (b) boxes comple                          | eted correctl  | y, zinc and  | hydrochloric   | acid (1)  |  |  | (1)  |
| (c) lighted splint                        | (1)  |  | pops (1)   |   |  |  |  |
| second mark                               | and mark consequential i.e. glowing splint = 0   |  |  |   |  |  |  |
| (a) smooth line/c                         | urve (1)   |  |  |   |  |  | (1   |
| (b) result at 60s                         | (1)  |  | not on curve   | e or similar  | (1)  |  | (2   |
| (c) calcium carbo                         | onate is bein  | g used up/a  | acid gets mo   | ore dilute (  | 1)   |  | (1)  |
| (a) to absorb/hold/contain the liquid (1) |  |  |  |   |  |  | (1   |
| (b) cracking (1)                          |  |  |  |   |  |  | (1)  |
| (c) bromine (water                        | er) (1)  |  | colourless   | (1)   |  |  | (2   |
| (d) remove the d                          | elivery tube   | from the wa  | ater (1)   |   |  |  |  |
| to prevent su                             | ck-back or s   | imilar effect  | t (1)  |   |  |  | (2   |
| Table of results                          |  |  |  |   |  |  |  |
| initial temp.                             | 24   | 23.5   | 24.5   | 23  | 22.5   | 23   |  |
| final temp.                               | _  | 20.5   | 17.5   | 14  | 11   | 7.5  |  |
| All 11 temperatur                         | es recorded  | correctly (  | 5), -1 for ea  | ach incorrec  | t  |  | (5   |
| (a) Graph poin                            | ts plotted co  | orrectly (3),  | -1 for ea  | ach incorrec  | t  |  |  |
| strai                                     | ght line (1)   |  |  |   |  |  | (4   |
| - , ,                                     |  |  | e.g. 12.5°C ± 0.5  |   |  |  | <b>(1</b> )  |
| indication                                | (1)  |  | °C (1)   |   |  |  | (2   |
| (ii) temperatu                            | ıre from gra <sub>l</sub>  | ph (1)   | e.g. 4°C ±   | 0.5   |  |  |  |
| extrapola                                 |  | (1)  |  |   |  |  | (2   |
|   | ion shown  | (1)  |  |   |  |  | <b>'-</b>  |
| (c) endothermic                           |  | (1)  |  |   |  |  |  |
| ·   | (1)  |  | ıller (1)  |   |  |  |  |
| (c) endothermic                           | (1)<br>changes wo  |  | ıller (1)  |   |  |  | (1)<br>(2)   |
|   | B flask (1)  (b) boxes completed (c) lighted splint second mark  (a) smooth line/c  (b) result at 60s  (c) calcium carbo  (a) to absorb/hole  (b) cracking (1)  (c) bromine (wate of the decoration of the decorat | (a) A measuring cylinder ( B flask (1)  (b) boxes completed correctle  (c) lighted splint (1) second mark consequente  (a) smooth line/curve (1)  (b) result at 60s (1)  (c) calcium carbonate is being (a) to absorb/hold/contain the (b) cracking (1)  (c) bromine (water) (1)  (d) remove the delivery tube to prevent suck-back or some context of the cont | (a) A measuring cylinder (1)  B flask (1)  (b) boxes completed correctly, zinc and (c) lighted splint (1) second mark consequential i.e. glow (a) smooth line/curve (1)  (b) result at 60s (1)  (c) calcium carbonate is being used up/a (a) to absorb/hold/contain the liquid (1)  (b) cracking (1)  (c) bromine (water) (1)  (d) remove the delivery tube from the wate oprevent suck-back or similar effect Table of results  initial temp. 24 23.5  final temp. 20.5  All 11 temperatures recorded correctly (4)  (a) Graph points plotted correctly (3), straight line (1)  (b) (i) temperature from graph (1)  indication (1)  (ii) temperature from graph (1) | (a) A measuring cylinder (1)  B flask (1)  (b) boxes completed correctly, zinc and hydrochloric (c) lighted splint (1) pops (1) second mark consequential i.e. glowing splint = (a) smooth line/curve (1)  (b) result at 60s (1) not on curve (c) calcium carbonate is being used up/acid gets mode (a) to absorb/hold/contain the liquid (1)  (b) cracking (1)  (c) bromine (water) (1) colourless (d) remove the delivery tube from the water (1) to prevent suck-back or similar effect (1)  Table of results  initial temp. 24 23.5 24.5 final temp 20.5 17.5  All 11 temperatures recorded correctly (5), -1 for each straight line (1)  (b) (i) temperature from graph (1) e.g. 12.5°C indication (1) °C (1)  (ii) temperature from graph (1) e.g. 4°C ± 10 c.g. 4°C ± 10 c.g | (a) A measuring cylinder (1)  B flask (1)  (b) boxes completed correctly, zinc and hydrochloric acid (1)  (c) lighted splint (1) pops (1) second mark consequential i.e. glowing splint = 0  (a) smooth line/curve (1)  (b) result at 60s (1) not on curve or similar  (c) calcium carbonate is being used up/acid gets more dilute (1)  (a) to absorb/hold/contain the liquid (1)  (b) cracking (1)  (c) bromine (water) (1) colourless (1)  (d) remove the delivery tube from the water (1)  to prevent suck-back or similar effect (1)  Table of results  initial temp. 24 23.5 24.5 23  final temp 20.5 17.5 14  All 11 temperatures recorded correctly (5), -1 for each incorrect straight line (1)  (b) (i) temperature from graph (1) e.g. 12.5°C ± 0.5 indication (1) °C (1) | (a) A measuring cylinder (1)  B flask (1)  (b) boxes completed correctly, zinc and hydrochloric acid (1)  (c) lighted splint (1) pops (1) second mark consequential i.e. glowing splint = 0  (a) smooth line/curve (1) (b) result at 60s (1) not on curve or similar (1)  (c) calcium carbonate is being used up/acid gets more dilute (1)  (a) to absorb/hold/contain the liquid (1)  (b) cracking (1) (c) bromine (water) (1) colourless (1)  (d) remove the delivery tube from the water (1) to prevent suck-back or similar effect (1)  Table of results  initial temp. 24 23.5 24.5 23 22.5 final temp 20.5 17.5 14 11  All 11 temperatures recorded correctly (5), -1 for each incorrect straight line (1)  (b) (i) temperature from graph (1) e.g. 12.5°C ± 0.5 indication (1) °C (1)  (ii) temperature from graph (1) e.g. 4°C ± 0.5 | (a) A measuring cylinder (1)  B flask (1)  (b) boxes completed correctly, zinc and hydrochloric acid (1)  (c) lighted splint (1) pops (1) second mark consequential i.e. glowing splint = 0  (a) smooth line/curve (1)  (b) result at 60s (1) not on curve or similar (1)  (c) calcium carbonate is being used up/acid gets more dilute (1)  (a) to absorb/hold/contain the liquid (1)  (b) cracking (1)  (c) bromine (water) (1) colourless (1)  (d) remove the delivery tube from the water (1) to prevent suck-back or similar effect (1)  Table of results  initial temp. 24 23.5 24.5 23 22.5 23  final temp 20.5 17.5 14 11 7.5  All 11 temperatures recorded correctly (5), -1 for each incorrect straight line (1)  (b) (i) temperature from graph (1) e.g. 12.5°C ± 0.5 indication (1) °C (1)  (ii) temperature from graph (1) e.g. 4°C ± 0.5 |

Mark Scheme

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Syllabus

|   | IGCSE – November 2004 0620   | 6   |     |  |  |  |  |
|---|--|---|-----|--|--|--|--|
|   | (f) 22 - 24°C/room temperature (1) reaction finished (1)                     | (   | (2) |  |  |  |  |
|   | (g) use a burette/pipette instead of measuring cylinder/insulation/lids/lags | (1)   | (1) |  |  |  |  |
| 5 | (a) white (1) crystals/solid (1)   | (   | (2) |  |  |  |  |
|   | (c) (i) white (1) precipitate (1)  | (   | (2) |  |  |  |  |
|   | (ii) white (1) precipitate (1)   | (   | (2) |  |  |  |  |
|   | (iii) reference to smell (1) alkaline/blue (1) pH 9 $\rightarrow$ 12 (1)     | 2 max   | (2) |  |  |  |  |
|   | (d) ammonia (1)  | (   | (1) |  |  |  |  |
|   | alkaline gas/ammonia given off (1)   |   |     |  |  |  |  |
|   | acid gas/hydrogen chloride given off (1)                                     | (   | (2) |  |  |  |  |
| 6 | a) litmus/indicator (1)  |   |     |  |  |  |  |
|   | bleached in chlorine, no effect with sodium chloride (1)                     | (   | (2) |  |  |  |  |
|   | (b) sodium hydroxide (1)   | n hydroxide (1)   |     |  |  |  |  |
|   | green (precipitate) with iron(II), brown (precipitate) with iron(III) (1)    | (precipitate) with iron(II), brown (precipitate) with iron(III) (1) |     |  |  |  |  |
|   | (c) add hydrochloric acid (1)  | drochloric acid (1)   |     |  |  |  |  |
|   | fizz/bubbles with carbonate, no reaction with sulphate (1)                   | (   | (2) |  |  |  |  |
|   | alternative with HC <i>l</i> and barium chloride (1)                         |   |     |  |  |  |  |
|   | white precipitate with sulphate, not carbonate (1)                           |   |     |  |  |  |  |
| 7 | chromatography (1) apply inks/spots to paper (1)                             |   |     |  |  |  |  |
|   | organic solvent/water (1) rises up paper (1)                                 |   |     |  |  |  |  |
|   | check heights/positions of spots (1) compare to find ink from banknote       | ghts/positions of spots (1) compare to find ink from banknote (1)   |     |  |  |  |  |
|   | N.B. all marks can be obtained from a diagram                                |   |     |  |  |  |  |

Mark Scheme

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Total marks for paper 60