UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

0620 CHEMISTRY

0620/62 Paper 6 (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, which would have considered the acceptability of alternative answers.

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

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1 **(a)** beaker (1) [1]

(b) any through tube with (only) two open ends (1)
outer tube with 'water' labelled and a way in and out (1) [2]

(c) turns red/pink (1)
reversible/rehydration/owtte/$CoCl_2$ going pink is the test for water (1) [2]

(d) water condensed at top of tube (1)
runs back onto hot tube/water onto $CoCl_2$ generates heat/owtte (1) **not**: suck back [2]

[Total: 7]

2 **(a)** smooth curve starting at origin and missing anomalous point (1) [1]

(b) point at 1.5 min/4th point/0.32 g (1) **ignore**: 3rd point [1]

(c) reaction finished/no more gas (1)
magnesium carbonate used up (1) [2]

(d) rising part of sketch curve below the original/less steep (1)
to half final level/0.25 g (1) [2]

[Total: 6]

3 **(a)** bulb/lamp lights/water level falls/green-yellow gas (1) [1]

(b) arrows labelling electrodes as anode/cathode or + – or the electrodes or Pt (1)
allow: labels either way round **not**: the wires labelled [1]

(c) **(i)** hydrogen (1) [1]

(ii) lighted splint (1) if Cl_2 in **(c)(i)** allow ecf for damp litmus/indicator paper
no ecf for anything other than Cl_2

pops (1) if Cl_2 in **(c)(i)** allow ecf for bleached/white/decolourised [2]
note: These are conditional marks so the result is conditional on the test, i.e. glowing splint pops = 0/2

(d) chlorine (1) soluble/dissolves/reacts (1) [2]

[Total: 7]

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
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4 **(a)** fizzing/bubbles stopped/no more gas produced (1) [1]

(b) **(i)** W little/no effect/slight increase (1)
X no effect/(slight) decrease (1)
Y speeds up reaction (1) [3]
note: The question is about rate, if candidates quote three different time differences, penalise first then allow the 'correct' answers (–11 s, +2 s, –199 s).
It must be clear that the increase in rate is less for W than Y for these 2 marks.

(ii) Y (1) [1]

(c) repeat experiments (1) take average/compare results/see if there is a difference (1) [2]

[Total: 7]

5 **(a)** temperature boxes correctly completed (2) 21, 25, 26, 27, 27, 26, 25 [2]

(b) temperature boxes completed correctly (2) 20, 19, 18, 17, 17, 18, 19 [2]

(c) all points correctly plotted (3), –1 for any incorrect
smooth line graphs (2)
labels (1) [6]

(d) **(i)** value from graph (1) allow: ±1/2 small square shown clearly (1) [2]

(ii) value from graph (1) allow: ±1/2 small square shown clearly (1) [2]

(e) endothermic (1) **ignore**: temperature decreases [1]

(f) lower temperature (change)/halved (1) **ignore**: reference to rate/time [1]

(g) room temperature/initial temperature from table/20°C/21°C (1) **ignore**: 25°C
reaction finished/owtte (1) [2]

(h) more readings/more points (1)
more reliable/more accurate (1) ignore: precise
can spot anomalous points or errors (1)
smoother graph/owtte (1) any [2]

[Total: 20]

6 **(d)** appearance colourless (1) **ignore**: clear
smell vinegar/pungent/sour/sharp (1) **ignore**: sweet/strong [2]

(e) pH 2–6 (1) [1]

(f) carbon dioxide (1) [1]

(g) copper/Cu^{2+} (1) carbonate/CO_3^{2-} (1) [2]

[Total: 6]

7 **(a)** use Universal/pH indicator/pH meter (1) ignore: litmus/indicator [1]

(b) **note**: This can be marked via three routes.

If they use a full bottle:
use full bottle (1)
(air-tight) connections (1)
syringe/inverted measuring cylinder/graduated tube to collect gas (1)
heat/shake (1)
until no more gas given off (1)
measure volume of gas (1)
any 6

If they use a sample:
use measured volume (1)
(air-tight) connections (1)
syringe/inverted measuring cylinder/graduated tube to collect gas (1)
heat/shake (1)
until no more gas given off (1)
measure volume of gas (1)
multiply to get full bottle value (1)
max 6

If they do it by loss in mass:
weigh the bottle/sample (1)
heat/shake (1)
until no more gas given off (1)
reweigh bottle (1)
use density to calculate volume (1)
max 5 [6]

[Total: 7]