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

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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]

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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]

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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]

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