UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 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.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1 **(a)** **(i)** water/H_2O inserted into box (1)

(ii) two arrows underneath magnesium and wool (1)

(b) magnesium oxide (1) [1]

(c) lighted splint (1) pops (1) [2]
glowing splint pops = 1

(d) highly/very exothermic reaction/high temperature reached/suck back of water/owtte (1) [1]

2 **(a)** Table of results
volumes correct (3) -1 for each incorrect
0, 17, 25, 40, 48, 54, 57 [3]

(b) points plotted correctly (3) -1 for each incorrect
smooth curve missing anomalous point (1) [4]

(c) **(i)** at 2 min (1) [1]

(ii) from graph ± half small square 30 cm^3 (1) indication on grid (1) [2]

(d) **(i)** decreases/slows down (1) **not** stops [1]

(ii) hydrochloric acid used up/hydrochloric acid becomes less concentrated (1) [1]
not reactants used

(e) **(i)** sketch curve to left of original (1) **ignore** if level is above original [1]

(ii) sketch curve to right and below original (1) [1]

3 **(a)** to speed up the reaction/owtte (1) **not** reacts easily [1]

(b) excess cobalt carbonate/base used (1) [1]

(c) metal could react/glass does not react/owtte (1) [1]

(d) solid/cobalt chloride visible/no more fizzing/no more gas (CO_2) produced (1) [1]
ignore colour change

(e) crystals forming (on glass rod/on edge) (1) [1]

(f) anhydrous cobalt chloride formed/water/steam removed/powder formed (1) turn blu

4 **(a)** Table of results for Experiments 1 and 2
initial boxes completed correctly 0.0, 2.0 (1)

(b) final boxes completed correctly 23.0, 48.0 (1)
differences correct 23.0, 46.0 (1) **allow** ecf
readings to 1 dp (1) [4]

(c) to remove impurities/solution F/owtte (1) [1]

(d) as an indicator/to show presence of iodine/owtte (1) [1]

(e) **(i)** Experiment 2 (1) [1]

(ii) Experiment 2 2x volume Experiment 1 [1]

(iii) solution **F** more concentrated/stronger (1) **allow** converse
2x as concentrated (2) [2]

(f) half value from table result for Experiment 1, 11.5 (1)
half volume of potassium iodate/iodine/$\frac{23}{2}$ (1) [2]

(g) **(i)** two sources of error (2)
e.g. experiment only done once/using a measuring cylinder to measure iodate/
acid going past end point/owtte [2]
ignore reference to temperature or human error

(ii) two meaningful improvements related to above (2)
e.g. use a pipette/burette/add smaller volumes e.g. 0.5 cm^3/repeat experiment [2]

5 **(a)** **(i)** blue (1) [1]

(b) white (1) precipitate (1) [2]

(c) **(i)** blue (1) precipitate (1) [2]

(ii) blue precipitate (1) dissolves/solution (1) deep/royal blue (1) [3]

(e) organic (1) hydrocarbon / flammable / fuel (1) [2]

6 **(a)** litmus paper/pH paper (1)
blue/8–10 (1)
test for NH_4^+ using NaOH = 0
correct chemical test and result e.g. Cu^{2+} could score 2 marks [

(b) 25 cm^3 of Kleen Up in flask/beaker (1) **not** test-tube
nitric acid in burette (1)
add indicator (1) no indicator = max 2
add/titrate acid (1)
until neutral/owtte (1)
note volume acid (1)
calculate concentration (1) max [5]

[Total: 60]