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

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

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

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(f) anhydrous cobalt chloride formed/water/steam removed/powder formed (1) turn blue (1) [2]

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]

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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 [2]

(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]

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