CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0620 CHEMISTRY

0620/61 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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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International Examinations

1 **(a)** electrode(s) / anode / cathode(either) (1)
allow: electrodes labelled wrong way round **not:** carbon/platinum

bulb / lamp / light (1) [2]

(b) lighted splint (1) pops (1) glowing splint = 0 [2]

(c) graduated test-tube / measuring cylinder (1) **not:** gas syringe as will not work

filled with electrolyte / acid / water inverted over electrode / owtte (1) [2]

(d) **(i)** sodium hydroxide (1) [1]

(ii) universal indicator with pH>7 / litmus turns blue (1) [1]
note: mark not awarded if **(d)(i)** is incorrect

2 **(a)** to prevent air / oxygen / bacteria entering jar (1) [1]

(b) pestle and / or mortar (1) [1]

(c) diagram of funnel and filter paper (1) labelled (1) [2]

(d) yeast would not work at high temperatures / kills yeast / denatures enzymes / owtte (1) [1]
allow: kills enzyme

(e) **(i)** bubbles / froth (1) [1]
not: gas / CO_2 given off / turns cloudy

(ii) (collect gas) and measure volume / count bubbles (1)

over certain time interval (1) [2]
allow: one mark for timing until bubbles / reaction stopped

(f) fractional distillation (1) [1]

3 (c) Table of results for Experiments 1–4

mass of solids correctly recorded (1) 1, 2, 3, 5 g

initial and maximum temperature boxes correctly completed (1)

initial 21, 23, 22, 24

maximum 23, 27, 28, 34

temperature differences correct (1) 2, 4, 6, 10 [3]

(d) results for Experiment 5

initial and final temperatures completed 21 and 13 (1)

temperature change completed correctly and shown as negative –8 (1) [2]

(e) all points correctly plotted 3–1 for any incorrect

straight line graph drawn with a ruler (1) [4]

(f) (i) value from graph 12 °C ± half small square (1)

extrapolation shown clearly (1) **allow:** ecf [2]

(ii) value from graph 4.5 g ± half small square (1)

indication shown clearly (1) **allow:** ecf [2]

(g) endothermic (1) [1]

(h) lower temperature change (1)

3 °C (1)

greater volume/more acid (1) any 2 for [2]

(i) room temperature or initial temperature from table 24 °C (1)

reaction finished / owtte (1) [2]

(j) advantage, e.g. comparability of results / fair test (1)
ignore: reference to reliability / accuracy

disadvantage, e.g. reaction not finished / temperature still changing / may not reach maximum temperature (1) [2]

4 tests on filtrate

(a) colourless (1) [1]
ignore: clear, **not:** white

(b) white (1) precipitate (1)

soluble in excess / dissolves (1) [3]

(c) white precipitate (1)
Insoluble / does not dissolve (1) [2]

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

(e) no reaction / no change / no precipitate (1) [1]

(g) transition metal / copper (1) carbonate (1) [2]

5 **(a)** both lose mass (1) [1]
not: change mass

(b) mass loss increases constantly in graph **A** (1)

becomes constant in graph **B** (after about 7–9 hours) (1)

mass loss or change is greater in acid/less in alkali (1) [3]

(c) goggles / lab coat / tongs / fume cupboard / well ventilated area any two [2]
ignore: reference to hair

6 weigh mixture (1)

add excess (1) sulfuric acid (1)

heat / stir (1)

filter (1) wash (1) dry (1) the carbon / residue

reweigh(1) calculate percentage (1) max 6 [6]

will not work = 0
ignore: details of evaporation of copper sulfate solution
note: must have at least one weighing for 6 marks