CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 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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CAMBRIDGE
International Examinations

1 **(a)** thermometer (1)

condenser (1)
allow condensing tube, condensating tube, etc. [2]

(b) arrows labelled – water (in) and water (out) (1) [1]

(c) fractional (1)

distillation (1) [2]

(d) **(i)** ethanol (1) [1]

(ii) temperature would rise (above 78 °C) (1) [1]

(e) alcohols are (in)flammable / catch fire / burn (1)
ignore: explode

Bunsen burner / flame / heat (1) [2]

2 **(a)** precipitation / double decomposition (1) [1]
allow: ppt

(b) **(i)** low / insoluble / does not dissolve (1) [1]

(ii) high / soluble / dissolves (1) [1]

(c) filtration (1) [1]

3 **(a)** volumes of hydrogen completed correctly (3)
0, 8, 34, 42, 46, 48, 48 [3]
guidance: 7 correct (3); 6 correct (2); 5 correct (1); 4 or fewer correct (0)

(b) points plotted correctly including origin (3)
guidance: 7 correct (3); 6 correct (2); 5 correct (1); 4 or fewer correct (0)

smooth curve missing anomalous point (1) [4]

(c) **(i)** point at 5 cm^3 / 8 cm^3 H_2 / second point (1) [1]

(ii) leak / loss / escape of gas or wrong amount / too little HC / or zinc (1) [1]
allow: syringe sticking

(iii) reading from graph (1) ± half small square

indication on graph (1) [2]

(d) excess acid (1)

all zinc reacted (1) [2]
allow: used up

(e) sketch curve identical (2)

different curve levelling out at 48 cm^3 (1) [2]
note: must be some indication of a second curve

4 **(a)** table of results for Experiment 1

initial and final volume boxes completed correctly (1) 0.0 and 16.8

difference box correctly completed (1) 16.8

all readings to one decimal place (1) [3]

(b) table of results for Experiment 2

initial (1) and final volume (1) boxes completed correctly 16.8 (1) and 25.2 (1)

difference box correctly completed (1) 8.4 [3]

(d) to colourless (1) [1]
not: clear

(e) coloured reacting mixture masks colour of phenolphthalein / reaction is finished / solution is acidic (1) [1]

(f) carbonate / carbon dioxide present (1) [1]
allow: hydrogencarbonate

(g) **(i)** 8.4 (1)
ecf: titre 1 – titre 2

cm^3 (1) [2]

(ii) 16.8 (1) [1]
ecf: 2 × titre 2

(iii) twice volume of acid needed to react with T (1) [1]
ecf: if **(g)(i)** or / and **(g)(ii)** wrong need quantitative link.
not: more (unqualified)

(h) **(i)** 67.2 cm^3 (1)

33.6 cm^3 (1)

4 × volume of solution R (1) [3]

(ii) volume of acid used > 50 cm^3 / more than burette can hold (1)

set up more than two burettes / 100.8 won't fit into 2 (1) [2]
allow: impurities / contamination (1)

5 **(d)** white (1)

precipitate (1) [2]

(e) no reaction / no change / no precipitate (1) [1]
allow: colourless solution

(f) not a chloride / halide (1) [1]

(g) oxygen / O_2 (1) [1]
not O

(h) transition metal / manganese (1)

hydrated salt (1)
ignore: sulfate

allow: catalyst (1) max [2]

6 same / measured volume of water (1)

initial temperature (1)

mass of nut(s) (1)

ignite / burn (1)
not: heat

for suitable time < 10 minutes / to completion (1)

final temperature of water (1)

repeat with other nut(s) (1)

compare / conclusion (1) max [7]