CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0620 CHEMISTRY

0620/63 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October / November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

1 **(a)** stirring / glass rod / stirrer (1)
Bunsen and / or burner (1)

(b) solvents (1)
solution (1) [2]

(c) B (1)
allow: filter
C (1)
allow: evaporating dish / basin [2]

(d) evaporated / lost into air owtte / turned into steam / turned into water vapour (1) [1]

2 **(a)** three mistakes (3) explanations (3)

heat in wrong place / water should not be heated (1) — needs to be under flask / reactants (1)

should not pass through water (1) — gas is soluble (1)

collection wrong way / gas jar is the wrong way up / gas should be collected downwards / gas should be collected in syringe (1) — gas denser than air (1) [6]

(b) in fume cupboard / well-ventilated area (1) [1]
ignore: goggles / masks etc.

3 **(a)** boiling points completed correctly (3),
–1 each incorrect
100, 121, 134, 139, 152, 159, 166 [3]

(b) points plotted correctly (3)
smooth curve through all points except anomalous point (1) [4]

(c) point at 4 atmos / 139°C / 4th point (1)
off curve / outlier / anomalous (1) [2]

(d) extrapolation (1)
value from graph (1)
168–170
unit °C (1) [3]

(e) test (1)
anhydrous copper sulfate or cobalt chloride(paper) (1)
result (1)
turns blue or pink (1)
ignore: original colour

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

initial and final volumes and differences completed correctly (1)
15.7, 0.0 and 15.7
to 1 decimal place (1) [2]
allow: 2 decimal places

(b) table of results for experiment 2
initial and final volumes completed correctly (1)
47.3 and 15.9
differences completed correctly (1)
31.4 [2]

(c) iron / Fe (1) (II) / 2+ (1) oxidised / reacts with air / to iron(III) (1) [3]

(d) **(i)** colourless to pink / purple (1) [1]
not: clear **allow:** reverse

(ii) not an acid and alkali reaction / potassium manganate is coloured / owtte / indicator not needed / a colour change already occurs / potassium manganate acts as an indicator (1) [1]

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

(ii) experiment 2 2× volume experiment 1 [1]

(iii) solution E more concentrated / stronger (1) or converse
2 × as concentrated (2) [2]

(f) half value from table result for Experiment 2 / 15.7 cm^3 (1)
half volume of E used (1) [2]

(g) advantage
easy to use / quick / convenient (1)

disadvantage
not accurate / owtte (1) [2]

5 **(c)** no reaction / no change / no precipitate (1)

(d) white (1) precipitate (1) [

(e) neutral (1) transition metal (ion) present (1) [2]

(f) reversible / equilibrium / neutralisation / (1)
solution returned to original colour / solution turns back to yellow (1) [2]

(g) oxygen (1) [1]

6 stated / known / same volume of hydrochloric acid (1)
use of named measuring apparatus (1)
addition of named indicator (1)
add tablets (1)
until the colour changes / pH =7 (1)
take measurement (1) e.g. number of tablets
repeat with other tablet (1)
compare / conclusion (1) e.g. brand that uses fewer tablets is most effective
allow: other correct methods including loss of mass and collection of gas

max [7]