**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

## 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.

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**1** **(a)** **(i)** fractional distillation

**(ii)** A = flask (1)
B = condenser (1)

**(b)** alkanes are inflammable / risk of fire owtte [1]

**(c)** octane [1]

**(d)** temperature on the thermometer would rise / be 174°C / pause in the distillation of liquid [1]

**[Total: 6]**

**2** **(a)** **(i)** measuring cylinder [1]

**(ii)** reaction will happen / is fast with cold acid [1]

**(b)** solid / powder visible / no more solid dissolves / fizzing stops when powder added [1]
**not** precipitate forms, **not** stops reacting

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

**(d)** heat to crystallising point owtte (1) to prevent loss of water of crystallisation (1) [2]
**not** heat and leave to cool

**[Total: 7]**

**3** highest temperatures correct (1) 28, 30, 32, 32
temperature rises correct (1) 7, 9, 11, 11 [2]

**(b)** points plotted correctly (2), –1 any incorrect
two straight lines through points, must use ruler (1) [3]

**(c)** **(i)** 0.25 g (1) extrapolation shown (1) [2]
**accept** extrapolation to zero and subsequent mass

**(ii)** all copper sulfate solution used up after 1.5 g zinc added / zinc is in excess / owtte [1]

**(d)** sketch graph to left of original / steeper slope than original (1)
rising above original (1) [2]

**[Total: 10]**

**4** **(a)** final volumes completed correctly (2)
13.0 and 34.0

initial volumes completed correctly (1)
0.0 and 8.0

differences correct (1)
13.0 and 26.0

–1 if any readings not to 1 dp, –1 if initial and final readings are reversed [4]

**(b)** hydroxide [1]

**(c)** **(i)** Experiment 2 / **G** [1]

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

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

**(d)** 13 (1) $cm^3$ (1)
half volume of **G** used (1) [3]

**(e)** **(i)** two sources of error
e.g. using a measuring cylinder to measure alkalis / going past end point owtte /
conical flask or measuring cylinder not cleaned [2]

**(ii)** two meaningful improvements related to above
e.g. use a pipette / burette / repeat experiment or use different indicator /
clean conical flask or measuring cylinder [2]

**[Total: 16]**

**5** **(c)** green (solid) [1]

**(d)** **(i)** green (1) precipitate (1) [2]

**(ii)** white (1) precipitate (1) [2]

**(e)** ammonia [1]

**(f)** ammonium (1) sulfate (1) not a halide (1) [3]

**[Total: 9]**

**6** **(a)** powder has larger surface area (1) speeds up reaction / more collisions (1)

**(b)** red / brown / pink [1]

**(c)** the ice / condensation [1]

**(d)** test add anhydrous copper sulfate / cobalt chloride paper (1)
result turns blue / pink (1) [2]

**[Total: 6]**

**7** **(a)** **(i)** less than 7 [1]

**(ii)** colour of orange drink obscures indicator colour owtte [1]

**(b)** chromatography (1)
apply orange drink to paper (1)
use of solvent (1)
comparison of spot heights or $R_f$ with E numbers and/or carotenes (1) [4]

**[Total: 6]**