CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

5070 CHEMISTRY

5070/42 Paper 4 (Alternative to Practicle), 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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1 **(a)** 25 (1) cm^3

(b) yellow (1) allow e.g light, dark but <u>not</u> greyish yellow

(c) filtration / centrifuge / decantation (1)

(d) 0.02 (1) moles

(e) 0.02 (1) moles

(f) 0.80 (1) moles
(ecf for **(e)** and **(f)** from **(d)**) **[Total: 6]**

2 **(a)** CuO (1) black (1)

(b) $CuO + H_2SO_4 \rightarrow CuSO_4 + H_2O$ (1)

(c) copper sulfate, blue (1) (both)

(d) zinc dissolves / disappears (1)

copper / brown / orange / pink / red-brown (not red)

deposit / residue / metal / substance / powder / solid (1) (both)

(blue) colour of solution reduces / fades or is lost (1)

gas evolved / effervescence / fizzing / bubbles (1)

(<u>not</u> hydrogen evolved) (<u>maximum 3 marks</u>)

(d) silver / gold / platinum / mercury / copper (1) **[Total: 8]**

3 **(a)** **(i)** propanol (1)
C_3H_7OH / C_3H_8O (1)

(ii) condenser (1)
(<u>not</u> fractionating column)
to return unreacted compounds to flask (1)
(<u>not</u> changes vapour to liquid)

(iii) electric heater – alcohols (reactants) are flammable (1)
(<u>not</u> dangerous)

(b) (i) 100 °C (1)

(ii) thermometer reads or temperature rises to 140 °C (1)

not just temperature rises

(iii) to prevent build up of pressure or explosion (1)

not to allow gas to escape **[Total: 8]**

4 **(b)** (1) **[Total: 1]**

5 **(b)** (1) **[Total: 1]**

6 **(a)** (1) **[Total: 1]**

7 **(a)** (1) **[Total: 1]**

8 **(a)** 1.61 (1) g

(b) pink to colourless (1)

(c)

26.3	29.3	47.1	1 mark for each
0.0	3.6	21.6	correct row **or**
26.3	25.7	25.5	column (3)

mean value = 25.6(1) cm^3

(d) 0.00256 (1) moles (0.0026 loses mark)

(e) $HCl + NaOH \rightarrow NaCl + H_2O$ (1)

(f) 0.00256 (1) moles

(g) 0.0256 (1) moles

(h) 0.05 (1) moles

(i) 0.0244 (1) moles

(j) 0.0122 (1) moles

(k) 132 (1)

(l) 132 – 90 (1) = 42
hence C_3H_6 / **x** = 3, **y** = 6 (1)

ecf throughout and for values of **y** in (**k**) **[Total: 16]**

9 **(a)** transition metal ions / transition metal present (1)
not **M** is a transition metal / it is a transition metal / transition metal on its own

(b) **(i)** green ppt (1)

(ii) ppt insoluble in excess (1)

(iii) ammonia evolved (1) gas turns litmus blue (1)
or ammonia turns litmus blue (2)

(c) $BaCl_2$ or $Ba(NO_3)_2$(1) with HCl or HNO_3 (1) white ppt (1)
omission of Ba salt in test = 0 marks
use of sulfuric acid or sulfates = 0 marks **[Total: 8]**

10 **(a)** all points plotted correctly (1)
smooth curve through the points (1)

(b) **(i)** 13 (1)

(ii) 7(1)

(iii) 27.5 cm^3 (1)

(c) **(i)** $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ (1)

(ii) 0.455 (allow 0.45 or 0.46 dm^3) (1)

(d) heat / evaporate / boil / leave in sun (1)
to crystallisation point / saturation point / evaporate some of water / leave solution to cool / leave to crystallise / leave on its own (1)
wash and dry crystals (1) **[Total: 10]**