

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.

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1 (a) 25 (1) cm³

(b) yellow (1) allow e.g light, dark but not 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) $\text{CuO} + \text{H}_2\text{SO}_4 \rightarrow \text{CuSO}_4 + \text{H}_2\text{O}$ (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)

(not hydrogen evolved) (maximum 3 marks)

(d) silver / gold / platinum / mercury / copper (1)

[Total: 8]

3 (a) (i) propanol (1)
C₃H₇OH / C₃H₈O (1)

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

(iii) electric heater – alcohols (reactants) are flammable (1)
(not dangerous)

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(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 correct row <u>or</u> column (3)
	0.0	3.6	21.6	
	26.3	25.7	25.5	

mean value = 25.6(1) cm³

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

(e) $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ (1)

(f) 0.00256 (1) moles

(g) 0.0256 (1) moles

(h) 0.05 (1) moles

(i) 0.0244 (1) moles

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(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]