

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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

5070 CHEMISTRY

5070/41

Paper 4 (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) 31.9 / 25.6 (1) 6.3 (1)
- (b) exothermic (1)
- (c) hydrogen (1) pops in flame (1)
- (d) (i) sodium hydroxide (1)
- (ii) blue (1)
- (e) sodium moves around the surface / catches fire / floats / melts / effervescence / explodes / violent or vigorous reaction / disappears / dissolves. Any 2 (2) [9]
- 2 (a) water in/out reversed / water flow wrong (1) closed system (1)
- (b) (i) fractionating column (1)
- (ii) separates components/vapours (1)
- (iii) condenser (1)
- (iv) liquefies vapours, turns vapour to liquid (1)
- (c) (i) 69 (1)
- (ii) hexane (1)
- (iii) temperature rises (1)
- (d) both liquids are flammable (1)
- (e) $40/86 = 0.47$; $60/100 = 0.60$ (1) $0.47/1.07 \times 100 = 44\%$ (1) [12]
- 3 (a) [1]
- 4 (a) [1]
- 5 (b) [1]
- 6 (c) [1]
- 7 (a) [1]

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8 (a) 6.24 (1)

(b) (i) green/colourless

(ii) purple/pink (1)

(c) 22.8 39.7 31.3

0.0 17.5 8.9

22.8 22.2 22.4

[Mark rows or columns to the benefit of the candidate. One mark for each correct row or column.] (3)

Mean titre = 22.3 cm³ (1)

(d) 0.000446 (1)

(e) 0.00223 (1)

(f) 0.0223 (1)

(g) 3.39 (1)

(h) 2.85 (1)

(i) 0.158 (1)

(j) 7.09 (7.1) (1)

(k) FeSO₄.7H₂O (1)

(l) simultaneous oxidation and reduction (1)
relating to MnO₄⁻ and Fe²⁺ ions (1)

(m) Fe³⁺ cannot be oxidised (1)

[17]

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9 (a) transition metal ions not present (1)

(b) (i) white ppt. (1)

(ii) insoluble in excess (1)

(c) no ppt. / slight white ppt. (1)

(d) Dilute HNO_3 (1), aq. $\text{Pb}(\text{NO}_3)_2$ / AgNO_3 (1) yellow ppt. (1)

Acidified loses acid mark, HCl loses both test marks. Use of AgI or PbI_2 loses both test marks.

[7]

10 (a) gas produced / evolved / given off (1)

(b) 0.63, 0.73, 0.80, 0.80 (1)

0.76, 0.80, 0.80, 0.80 (1)

(c) all points correctly plotted (1)

two smooth curves passing through zero (2)

(d) reaction is complete / no more gas given off / acid used up (1)

(e) (i) 0.56 (1)

(ii) 90.30 (1)

(f) reaction is faster (1)

In parts **(c)** and **(e)** please read candidate's graph in awarding marks.

Read graphs to $\pm$ half small square.

[10]