CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5070 CHEMISTRY

5070/41 Paper 4 (Alternative to Practical), maximum raw mark 60

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CAMBRIDGE
International Examinations

1 **(a)** **(i)** propanol (1) [1]

(ii) catalyst / speeds up reaction (1) [1]

(iii) displayed formula of propene (1) [1]

(b) (aqueous) bromine (1)
(turns) colourless / decolourises (1) [2]

(c) **(i)** carbon dioxide (1)
limewater turns milky / limewater forms a white precipitate (1) [2]

(ii) $2C_3H_6 + 9O_2 \rightarrow 6CO_2 + 6H_2O$
species (1) balancing (1) [2]

[Total: 9]

2 **(a)** hydrogen (1)
lighted splint pops / pops in a flame (1) [2]

(b) **(i)** chlorine (1) [1]

(ii) $2Cl^- \rightarrow Cl_2 + 2e^-$ **or** $2Cl^- - 2e^- \rightarrow Cl_2$ (1) [1]

(c) **(i)** oxygen (1)
glowing splint relights (1) [2]

(ii) $4OH^- \rightarrow 2H_2O + O_2 + 4e^-$ **or** $4OH^- - 4e^- \rightarrow 2H_2O + O_2$ (1) [1]

[Total: 7]

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

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

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

6 **(a)** 3.43 (g) (1) [1]

(b) volumetric flask / standard flask / graduated flask (1) [1]

(c) **(i)** pipette (1) [1]

(ii) purple / pink (1) [1]

(d) 27.3 37.9 42.7 one mark for each correct row **or** column

0.0 10.0 15.6 to the benefit of the candidate (3)

27.3 27.9 27.1

average volume = 27.2 (cm^3) (1) [4]

(e) 0.000544 (mol) (1) [1]

(f) 0.00136 (mol) (1) [1]

(g) 0.0272 (mol) (1) [1]

(h) 126 (1) [1]

(i) M_r of $H_2C_2O_4$ = 90
126 – 90 = 36 (1)
36 / 126 × 100 = 28.6 (%) (1) [2]

[Total: 14]

7 **(a)** transition metal present / transition element present /
Z is a compound of a transition metal / **Z** is a compound of a transition element (1) [1]

(b) **(i)** blue precipitate (1)

(ii) insoluble in excess (1) [2]

(c) **(i)** blue precipitate (1)

(ii) deep/dark blue solution formed (1) [2]

(d) (dilute / aqueous) nitric acid (1)
(aqueous) silver nitrate (1)
white precipitate (1) [3]

(e) $CuCl_2$ (1) [1]

[Total: 9]

8 **(a)** to reach room temperature / steady temperature (1) [1]

(b) exothermic (1) [1]

(c) all sodium hydroxide has reacted / reaction is complete (1) [1]

(d) all points plotted correctly (1)
one mark each for two intersecting straight lines (2) [3]

(e) **(i)** 26.0 (cm^3) (1) [1]

(ii) 31.8 (°C) (1) [1]

(f) **(i)** $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$ (1) [1]

(ii) 0.05 moles of NaOH react with 0.025 moles of H_2SO_4 (1)
concentration of H_2SO_4 = 0.96 (mol / dm^3) (1) [2]

(g) **(i)** 7.6 (°C) (1) [1]

(ii) 76 (cm^3) (1) [1]

(iii) moles of NaOH = 0.05 (1)
ΔH = 48.5 (kJ / mol) (1) [2]

(h) heat **or** evaporate / warm **or** boil / leave in sun (1)
to crystallisation point / saturation point / leave some of water / leave (solution) to cool / leave (solution) to crystallise / leave a concentrated solution (1)
wash and dry crystals (1) [3]

[Total: 18]