

**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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- 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]

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- 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 =  $27.2 \text{ (cm}^3\text{)}$  (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  $\text{H}_2\text{C}_2\text{O}_4 = 90$   
 $126 - 90 = 36$  (1)  
 $36 / 126 \times 100 = 28.6 \text{ (\%)}$  (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]

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(e)  $\text{CuCl}_2$  (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)  $26.0 \text{ (cm}^3\text{)}$  (1) [1]

(ii)  $31.8 \text{ (}^\circ\text{C)}$  (1) [1]

(f) (i)  $2\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$  (1) [1]

(ii) 0.05 moles of NaOH react with 0.025 moles of  $\text{H}_2\text{SO}_4$  (1)  
concentration of  $\text{H}_2\text{SO}_4 = 0.96 \text{ (mol/dm}^3\text{)}$  (1) [2]

(g) (i)  $7.6 \text{ (}^\circ\text{C)}$  (1) [1]

(ii)  $76 \text{ (cm}^3\text{)}$  (1) [1]

(iii) moles of NaOH = 0.05 (1)  
 $\Delta H = 48.5 \text{ (kJ/mol)}$  (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]