



**QUESTIONSHEET 4**

- (a) (i) to condense water 1
- (ii) find boiling point/boiling point is 100°C/  
find freezing point/freezing point is 0°C/  
blue cobalt chloride paper goes pink 1

Note: Cobalt chloride paper test only shows the presence of water, not that the substance is water.  
It could be dilute acid, salt solution etc.

- (b) (i)  $2.5 - 1.6 = 0.9 \text{ g}$  1
- (ii)  $0.9 / 2.5$  1  
 $= 36\%$  1
- (c) (i) dehydration 1
- (ii)  $\text{CuSO}_4 + 5\text{H}_2\text{O} \rightarrow \text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  1
- (iii) 1

**TOTAL 8****QUESTIONSHEET 5**

- (a) (i)  $23 + 14 + (3 \times 16) = 85$  1
- (ii)  $14 + (4 \times 1) + 14 + (3 \times 16) = 80$  1
- (b) (i)  $14/85 \times 100$  1  
 $= 16.5\%$  1
- (ii)  $28/80 \times 100$  1  
 $= 35\%$  1
- (c) ammonium nitrate 1
- (d) Two from:  
alkaline/gas/poisonous/very soluble/smelly 2

**TOTAL 9**

**QUESTIONSHEET 6**

- (a) (i)  $3.5/14 = 0.25$   $4/16 = 0.25$  1  
NO 1
- (ii)  $50/16 = 3.1$   $50/32 = 1.5625$  1  
SO<sub>2</sub> 1
- (iii)  $39/39 = 1$   $1/1 = 1$   $12/12 = 1$   $48/16 = 3$  1  
KHCO<sub>3</sub> 1
- (iv) mass of oxygen =  $16.0 - 11.2 = 4.8$  1  
 $4.8/16 = 0.3$   $11.2/56 = 0.2$  1  
Fe<sub>2</sub>O<sub>3</sub> 1
- (b) (i)  $4.04/1 = 4.04$   $24.24/12 = 2.02$   $71.72/35.5 = 2.02$  1  
ratio of H:C:Cl = 2:1:1 1  
CH<sub>2</sub>Cl 1
- (ii) relative mass of CH<sub>2</sub>Cl = 49.5 1  
 $99/49.5 = 2$  therefore C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub> 1

**TOTAL 14****QUESTIONSHEET 7**

- (a) copper(II) oxide 1
- (b) (i) copper(II) chloride 1  
(ii) copper and chlorine 2  
(iii) bleaches 1  
moist indicator paper 1
- (c) (i) copper 1  
(ii) water 1  
(iii)  $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$  1  
(iv) reducing agent 1

**TOTAL 10**

**QUESTIONSHEET 8**

- (a) (i) to allow you to find mass of substances in it 1
- (ii)  $125.9 - 117.8 = 8.1$  g 1
- (iii)  $124.7 - 117.8 = 6.9$  g 1
- (iv)  $8.1 - 6.9 = 1.2$  g 1
- (v)  $1.2/8.1 \times 100$  1  
= 14.8% 1
- (b) heat the crucible again 1  
cool and reweigh 1  
repeat until weight is constant 1
- (c) (i) 208 1
- (ii) 18 1
- (d) moles of  $\text{BaCl}_2 = 6.9/208 = 0.0332$  1  
moles of water =  $1.2/18 = 0.0667$  1  
ratio of 1:2 therefore  $x = 2$  1

**TOTAL 14****QUESTIONSHEET 9**

- (a) precipitation 1
- (b) reduction 1
- (c) endothermic 1
- (d) reversible 1
- (e) decomposition 1
- (f) oxidation 1
- (g) displacement 1
- (h) combustion 1

Note: In a question of this type it is not necessary to use all the available terms.  
Sometimes, a term will be required more than once.

**TOTAL 8**

**QUESTIONSHEET 10**

- |     |  |        |
|-----|--|--------|
| (a) | energy/ heat transferred to surroundings   | 1      |
| (b) | Ca(OH) <sub>2</sub>  | 1      |
| (c) | neutralise acidity in lakes/soil/swimming pools  | 1      |
| (d) | bubble carbon dioxide through it   | 1      |
| (e) | heating it strongly  | 1      |
| (f) | compounds can be formed from each other<br>any substances added are given off at a later stage | 1<br>1 |

**TOTAL 7****QUESTIONSHEET 11**

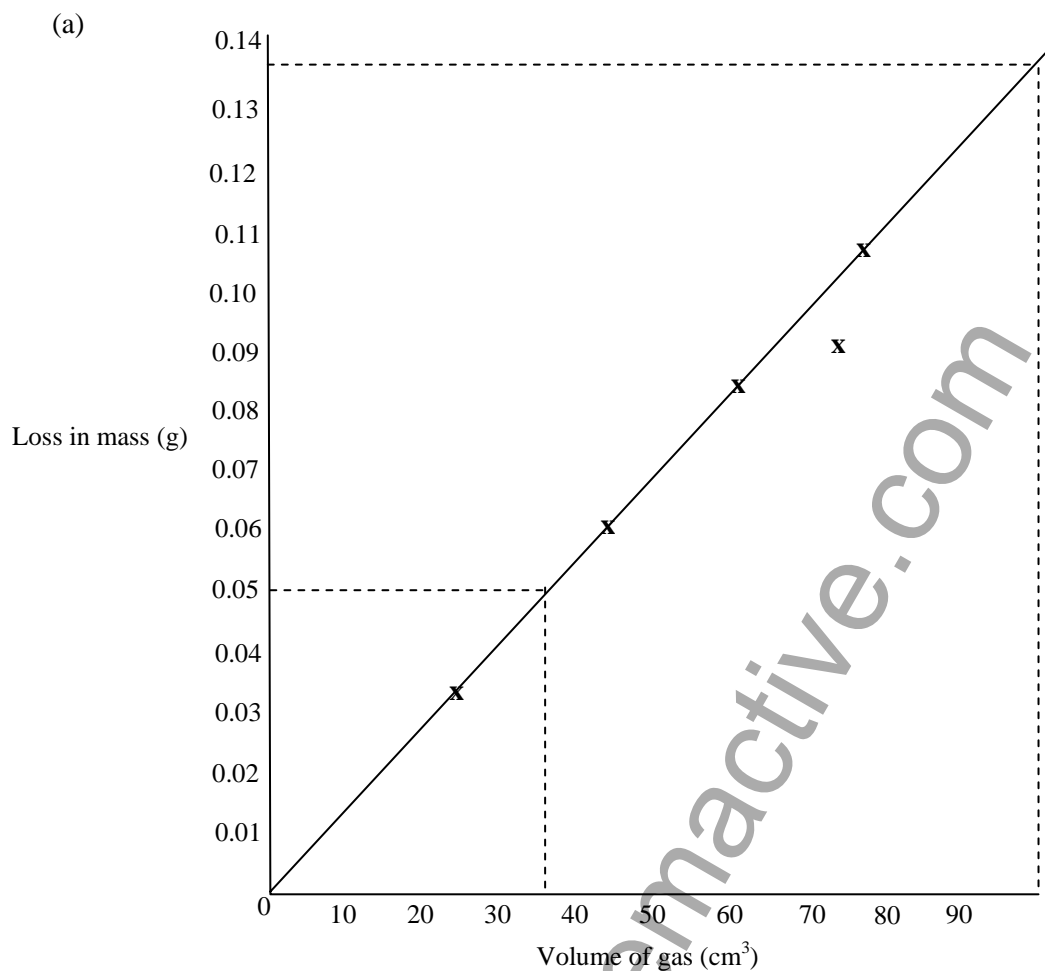
- |     |   |   |
|-----|---|---|
| (a) | displacement  | 1 |
| (b) | c, e, f   | 3 |
| (c) | chlorine + potassium bromide → bromine + potassium chloride | 1 |
| (d) | Cl <sub>2</sub> + 2KBr → 2KCl + Br <sub>2</sub>             | 2 |
| (e) | chlorine most reactive, then bromine, last iodine           | 1 |
| (f) | fluorine displaces chlorine                                 | 1 |
| (g) | no reaction   | 1 |

**TOTAL 10****QUESTIONSHEET 12**

- |     |  |        |
|-----|--|--------|
| (a) | all are soluble  | 1      |
| (b) | all are soluble  | 1      |
| (c) | all except nitrate<br>are insoluble                                | 1<br>1 |
| (d) | (i) <u>lead carbonate</u> + sodium nitrate                         | 2      |
|     | (ii) no precipitate formed/ no reaction                            | 1      |
|     | (iii) <u>barium sulphate</u> + sodium chloride                     | 2      |
| (e) | barium sulphate is very insoluble<br>not absorbed into bloodstream | 1<br>1 |

**TOTAL 11**

## QUESTIONSHEET 13



|                   |   |
|-------------------|---|
| labelled axes     | 1 |
| sensible scales   | 1 |
| accurate plotting | 1 |
| line of best fit  | 1 |

- (b) student 4 1
- (c) (i) 38 cm<sup>3</sup> (+/- 1 cm<sup>3</sup>) 1
- (ii) 0.02 g (+/- 0.005 g) 1
- (d) (i) find the density of the gas / mass/volume 1  
compare to data book 1
- (ii) glowing splint 1  
relights 1

Note: Always include the result of a chemical test. It is not sufficient to say, for example, "Use the glowing splint test".

**TOTAL 11**

**QUESTIONSHEET 14**

- (a) (i) A and D 1  
(ii) rusting requires water/moisture and oxygen/air 1
- (b) tube D 1  
salt/ions in salt accelerates rusting 1
- (c) zinc/magnesium attached to hull/pier 1  
zinc/magnesium more reactive than iron 1  
corrodes in preference to iron 1
- (d) (i) alloyed with another metal/electroplated 1  
(ii) coated in paint/plastic/electroplated 1

**TOTAL 10****QUESTIONSHEET 15**

- (a) Two from:  
alloys may resist corrosion  
alloys may look more attractive  
alloys have lower melting points 2
- (b) (i) iron/steel 1  
(ii) galvanising 1
- (c) (i) sulphur dioxide 1  
(ii)  $\text{Zn}^{2+}$  1
- (d) neutralisation 1
- (e) (i) carbon 1  
(ii)  $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$  1  
(iii) reduction 1

**TOTAL 10**

**QUESTIONSHEET 16**

|     |       |   |                |
|-----|-------|---|----------------|
| (a) | (i)   | sodium hydrogencarbonate  | 1              |
|     | (ii)  | acid  | 1              |
|     | (iii) | sodium carbonate  | 1              |
| (b) |       | the acid and carbonate react together<br>and fizz/produce carbon dioxide      | 1<br>1         |
| (c) | (i)   | raising agent<br>because it decomposes when heated to give carbon dioxide gas | 1<br>1         |
|     | (ii)  | does not produce carbon dioxide when heated                                   | 1              |
|     |       |   | <b>TOTAL 8</b> |

**QUESTIONSHEET 17**

|     |      |   |                 |
|-----|------|---|-----------------|
| (a) | (i)  | calcium oxide   | 1               |
|     | (ii) | calcium carbonate   | 1               |
| (b) |      | endothermic   | 1               |
| (c) |      | limestone glowed brightly<br>crumbled   | 1<br>1          |
| (d) |      | process is continuous/less energy loss/ time-saving   | 1               |
| (e) | (i)  | Two from:<br>jobs created<br>money brought into area<br>extension better than starting new quarry | 2               |
|     | (ii) | Two from:<br>loss of animal habitats<br>eyesore<br>dust<br>noise<br>extra lorries on roads        | 2               |
|     |      |   | <b>TOTAL 10</b> |

**QUESTIONSHEET 18**

|     |       |                                   |                |
|-----|-------|-----------------------------------|----------------|
| (a) | (i)   | delivery tube on end of test tube | 1              |
|     |       | delivery tube through cork        | 1              |
|     |       | end of delivery tube in limewater | 1              |
|     | (ii)  | limewater                         | 1              |
|     |       | goes cloudy/milky                 | 1              |
| (b) | (i)   | copper produces a green flame     | 1              |
|     | (ii)  | dipped in acid                    | 1              |
|     | (iii) | calcium                           | 1              |
| (c) |       | calcium carbonate                 | 1              |
|     |       |                                   | <b>TOTAL 9</b> |

**QUESTIONSHEET 19**

|     |      |                              |                |
|-----|------|------------------------------|----------------|
| (a) |      | D                            | 1              |
| (b) | (i)  | A                            | 1              |
|     | (ii) | hydrogen                     | 1              |
| (c) |      | C                            | 1              |
| (d) | (i)  | D                            | 1              |
|     | (ii) | irritant/harmful             | 1              |
| (e) |      | hydrogen burns to make water | 1              |
|     |      | wasserstoff = water maker    | 1              |
|     |      |                              | <b>TOTAL 8</b> |

**QUESTIONSHEET 20**

|     |      |                            |                |
|-----|------|----------------------------|----------------|
| (a) | (i)  | $C + O_2 \rightarrow CO_2$ | 1              |
|     | (ii) | poisonous                  | 1              |
| (b) | (i)  | oxygen is removed          | 1              |
|     | (ii) | carbon                     | 1              |
| (c) |      | harder                     | 1              |
|     |      | lighter in colour          | 1              |
|     |      | rougher texture            | 1              |
|     |      |                            | <b>TOTAL 7</b> |