

**CAMBRIDGE**  
INTERNATIONAL EXAMINATIONS

**NOVEMBER 2002**

**INTERNATIONAL GCSE**

**MARK SCHEME**

**MAXIMUM MARK : 80**

**SYLLABUS/COMPONENT : 0620/2**

**CHEMISTRY  
(CORE)**



UNIVERSITY of CAMBRIDGE  
Local Examinations Syndicate

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- 1 (a)(i) alkane [1]  
(ii) correct formula showing all atoms and bonds [1]  
ALLOW: correct dot and cross diagrams  
(iii) natural gas [1]
- (b)(i) 78% [1]  
ALLOW: 77-79%  
(ii) boron/ carbon/ oxygen/ fluorine/ neon [1]
- (c)(i) speed up reaction/ lower activation energy etc [1]  
NOT: starts the reaction/ alters the rate of the reaction  
(ii) increases [1]
- (d)(i) 2 (NH<sub>3</sub>) [1]  
(ii) reversible reaction/ reaction reaches equilibrium/ equilibrium reaction/  
reaction can go backwards as well as forwards [1]
- (e) molecules arranged randomly;  
molecules close together [2]  
gas structure = 0
- (f) (damp red) litmus paper/ universal indicator paper [2]  
turns blue  
ALLOW: HCl vapour; white fumes
- (g)(i) increase growth of plants [1]  
(ii) sulphuric acid [1]
- 2 (a) charged species/ charged atom/ charged group of atoms [1]
- (b) calcium/ Ca<sup>2+</sup> [1]
- (c) 2 (in front of e<sup>-</sup>) [1]
- (d) any two of: calcium sulphate/ sodium chloride/ sodium hydrogencarbonate/  
sodium sulphate [2]  
ALLOW: calcium hydrogencarbonate; calcium carbonate
- (e) CaCl<sub>2</sub> [1]
- (f)  $\sqrt{\sqrt{x}\sqrt{y}}$  [2]  
(2 if all correct 1 if one mistake)
- (g) filter paper in filter funnel;  
receptacle underneath with water shown in it - labelled;  
clay/ residue on filter paper -labelled [3]

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- 3 (a) chlorine: yellow-green/ green;  
 NOT: yellow  
 iodine: black/ grey/ grey-black;  
 fluorine: gas  
 bromine: liquid [4]
- (b) ALLOW: between 140 and 250(°C) (inclusive) [actual = 184°C] [1]
- (c)(i) chlorine + potassium bromide → bromine + potassium chloride  
 (2 if all correct / -1 per error) [2]
- (ii) chlorine  
 bromine  
 iodine [1]
- (d) Any suitable use e.g. in swimming pools/ disinfection/ sterilizing water supplies etc/  
 killing bacteria / for bleaching/ in making insecticides/ making dry cleaning fluids/  
making correct, named inorganic or organic chemical/ making matches/  
making fireworks/ recovery of tin or aluminium from scrap metal [1]
- (e) covalent [1]
- 4 (a) Substance containing carbon and hydrogen and perhaps other elements/ oxygen [1]
- (b) B and C [1]  
 ALLOW: correct formulae/ names
- (c) A [1]  
 ALLOW: correct formula/ name
- (d) D [1]  
 ALLOW: correct formula/ name
- (e) A [1]  
 ALLOW: correct formula/ name
- (f)(i) gives out heat/ raises temperature of surroundings [1]  
 ALLOW: gives out energy
- (ii) carbon dioxide; water [2]  
 ALLOW: correct symbols
- (iii) carbon monoxide [1]  
 ALLOW: CO
- (g) C<sub>4</sub>H<sub>8</sub>O<sub>2</sub> [1]
- (h) 88 [1]
- (i) chromatography [1]

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- 5 (a) rock which contains a particular metal / rock from which metal can be extracted [1]  
ALLOW: mineral (in place of rock)
- (b) limestone [1]
- (c)(i) iron oxide + carbon  $\rightarrow$  iron + carbon monoxide [1]  
ALLOW: iron(III) oxide  
NOT: iron(II) oxide
- (ii) removal of oxygen from compound / decrease in oxidation number / gain of electrons [1]  
ALLOW: addition of hydrogen
- (d)(i) the air [1]
- (ii) absorbs heat / takes in heat from the atmosphere/ temperature of surroundings falls [1]  
ALLOW: absorbs/ takes in energy
- (e)(i) heated / made molten; [2]  
oxygen/ oxygen enriched air blasted through it
- (ii) car bodies/ machinery etc [1]  
NOT: cutlery/ chemical plants
- (f)(i) lower pH, the faster the corrosion [1]  
NOT: more acidic, the faster the corrosion
- (ii) higher temperature leads to greater corrosion; [1]  
(acid/ air) particles moving faster at higher temperatures / particles have more energy at higher temperatures;  
NOT: steel particles moving faster  
NOT: vibrating faster  
more collisions (with steel) [2]
- (iii) sulphur dioxide / nitrogen oxides; [2]  
sulphur dioxide: burning fossil fuels/ power stations/ volcanoes etc  
nitrogen oxides: car exhausts/ burning fossil fuels etc [2]

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- 6 (a) distillation [1]
- (b) (round-bottomed) flask [1]
- (c) cools down vapour / lowers temperature/ idea of cooling;  
so that vapour is changed to liquid / so vapour condenses [2]
- (d)(i) pH 7 [1]  
(ii) 100°C [1]  
NOT: 100
- (e)(i) 24(g) [1]  
(ii) calcium carbonate/  $\text{CaCO}_3$  [1]  
(iii) magnesium chloride [1]  
(iv) acidify with hydrochloric or nitric acid;  
add barium chloride;  
white precipitate. [3]
- (f)(i) ions; [1]  
(free to) move [2]  
(ii) anode: chlorine; cathode: sodium [2]  
(iii) graphite/ carbon (allow Pt) [1]