CAMBRIDGE
INTERNATIONAL EXAMINATIONS

NOVEMBER 2002

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 80

SYLLABUS/COMPONENT : 0620/2

CHEMISTRY
(CORE)

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

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_3) [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
gas structure = 0 [2]

(f) (damp red) litmus paper/ universal indicator paper
turns blue [2]
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^{2+} [1]

(c) 2 (in front of e^-) [1]

(d) any two of: calcium sulphate/ sodium chloride/ sodium hydrogencarbonate/ sodium sulphate [2]
ALLOW: calcium hydrogencarbonate; calcium carbonate

(e) $CaCl_2$ [1]

(f) √√×√
(2 if all correct 1 if one mistake) [2]

(g) filter paper in filter funnel;
receptacle underneath with water shown in it - labelled;
clay/ residue on filter paper -labelled [3]

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) $C_4H_8O_2$ [1]

(h) 88 [1]

(i) chromatography [1]

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 →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;
oxygen/ oxygen enriched air blasted through it [2]
(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;
sulphur dioxide: burning fossil fuels/ power stations/ volcanoes etc
nitrogen oxides: car exhausts/ burning fossil fuels etc [2]

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/ $CaCO_3$ [1]
(iii) magnesium chloride [1]
(iv) acidify with hydrochloric or nitric acid;
add barium chloride;
white precipitate. [3]

(f)(i) ions;
(free to) move [2]
(ii) anode: chlorine; cathode: sodium [2]
(iii) graphite/ carbon (allow Pt) [1]