

NOVEMBER 2002

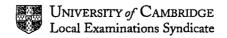
INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0620/2

CHEMISTRY (CORE)



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1 (a)(i) alkane (ii) correct formula showing all atoms and bonds ALLOW: correct dot and cross diagrams (iii) natural gas	[1] [1] [1]
(b)(i) 78% ALLOW: 77-79% (ii) boron/ carbon/ oxygen/ fluorine/ neon	[1]
(c)(i) speed up reaction/ lower activation energy etc NOT: starts the reaction/ alters the rate of the reaction (ii) increases	[1] [1]
(d)(i) 2 (NH₃)(ii) reversible reaction/ reaction reaches equilibrium/ equilibrium reaction/ reaction can go backwards as well as forwards	[1] [1]
(e) molecules arranged randomly;molecules close togethergas structure = 0	[2]
(f) (damp red) litmus paper/ universal indicator paper turns blue ALLOW: HCl vapour; white fumes	[2]
(g)(i) increase growth of plants (ii) sulphuric acid	[1] [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 ALLOW: calcium hydrogencarbonate; calcium carbonate	[2]
(e) CaCl ₂	[1]
(f) $\sqrt{1}$ $\sqrt{1}$ (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]

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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 ALLOW: correct formulae/ names	[1]
	(c) A ALLOW: correct formula/ name	[1]
	(d) D ALLOW: correct formula/ name	[1]
	(e) A ALLOW: correct formula/ name	[1]
	(f)(i) gives out heat/ raises temperature of surroundings ALLOW: gives out energy	[1]
	(ii) carbon dioxide; water ALLOW: correct symbols (iii) carbon monoxide ALLOW: CO	[2] [1]
	(g) C ₄ H ₈ O ₂	[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 ALLOW: mineral (in place of rock)	[1]
(b) limestone	[1]
(c)(i) iron oxide + carbon →iron + carbon monoxide ALLOW: iron(III) oxide NOT: iron(II) oxide	[1]
(ii) removal of oxygen from compound / decrease in oxidation number / gain of electrons ALLOW: addition of hydrogen	[1]
(d)(i) the air	[1]
(ii) absorbs heat / takes in heat from the atmosphere/ temperature of surroundings falls ALLOW: absorbs/ takes in energy	[1]
(e)(i) heated / made molten; oxygen/ oxygen enriched air blasted through it (ii) car bodies/ machinery etc NOT: cutlery/ chemical plants	[2] [1]
(f)(i) lower pH, the faster the corrosion	[1]
NOT: more acidic, the faster the corrosion (ii) higher temperature leads to greater corrosion; (acid/ air) particles moving faster at higher temperatures / particles have more energy at higher temperatures; NOT: steel particles moving faster	[1]
NOT: vibrating faster more collisions (with steel) (iii) sulphur dioxide / nitrogen oxides; sulphur dioxide: burning fossil fuels/ power stations/ volcanoes etc	[2]
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 (ii) 100°C NOT: 100	[1] [1]
	(e)(i) 24(g) (ii) calcium carbonate/ CaCO ₃ (iii) magnesium chloride (iv) acidify with hydrochloric or nitric acid;	[1] [1] [1]
	add barium chloride; white precipitate.	[3]
	(f)(i) ions; (free to) move (ii) anode: chlorine; cathode: sodium (iii) graphite/ carbon (allow Pt)	[2] [2] [1]