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Mark Scheme (Results)

March 2012

GCSE Chemistry
5CH1H/01

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Question Number	Answer	Acceptable answers	Mark
1(a)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(i)	An explanation linking **two** of the following points • break down of (hydrocarbons/molecules / alkanes) (1) • into smaller (hydrocarbons/molecules / alkanes) (1)	**Ignore** 'chains **of** …..'/ polymers Ignore 'separating Ignore reasons for cracking	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b) (ii)	an explanation linking the following • (molecule) containing (carbon-carbon) double / multiple bond (1) • contains (atoms of) carbon and hydrogen (1) • only (1)	Allow references to addition reactions. Ignore 'alkene', 'spare bonds', 'doesn't have max no of atoms or H bonded' Can only score third point if second point scored	**(3)**

Question Number	Answer	Acceptable answers	Mark
1(b)(iii)	a description including the following • from orange/brown/yellow (1) • to colourless (1)	Allow red-brown but no other mention of red **Ignore** clear / discolour	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	{water vapour / steam} condensed/ changed to liquid	Allow steam cooled	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	(carbon dioxide) dissolved/ absorbed / trapped	Ignore refs to plants/ rocks	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(iii)	A description including the following points • (primitive) plants (produce oxygen) (1) • (by) photosynthesis (1)	Allow named plants Reject answers involving respiration	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	all oxygen {reacted / used up} / excess copper (present)	no oxygen left / insufficient oxygen Reject not enough time / not hot enough	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(iii)	volume gas used = 32-24 (1) = 8 (cm^3) percentage = 32-24/32 x 100 (1) = 25 (%)		**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(iv)	oxygen in air in test tube also reacted /more than 32 cm^3 of air because of air in test tube / air in test tube will react but is not measured	some gases leaked out of apparatus allow another gas has reacted with copper	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)	a description including the following • heat/reduced {with} (1) • (with) carbon/coke/carbon monoxide(1)	**Ignore** references to blast furnace **Reject** references to electrolysis	**(2)**

Question Number	Answer	Acceptable answers	Mark
3 (c)	A description including **three** of the following, with a maximum of **two** from either group of three • reduction is the loss of oxygen (1) • copper(oxide) loses oxygen (1) • (hence) copper (oxide) is reduced (1) OR • oxidation is the gain of oxygen (1) • hydrogen gains oxygen (1) • (hence) hydrogen is oxidised (1)		**(3)**

Question Number	Answer	Acceptable answers	Mark
3(d)	an explanation linking **one** of the following pairs • when bent / deformed (1) • shape memory alloys return to their original shape (1) OR • shape memory alloys return to their original shape (1) • (but) other alloys stay deformed (1)	must refer to metal's shape being changed i.e. ignore "broke", "sat on etc."	**(2)**

Question Number	Answer	Acceptable answers	Mark
3 (e)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
4 (a)	sedimentary		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	An explanation linking **two** of the following • limestone (1) • (changed by) heat (1) • (changed by) pressure (1) • (heat from) magma / {hot / molten} rock (next to it) (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	An explanation linking the following • X cools slowly (1) • Y cools quickly (1) • suggested reason for slower cooling e.g. larger volume (of rock) / further below surface / heat escapes more slowly /further from edge of molten rock (1)	X has cooled slower (than Y) (2) Ignore references to intrusive and extrusive rocks	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)(i)	CO_2	**Ignore** carbon dioxide, state symbols **Reject** any other form of formula such as CO2 / CO^2 / Co_2	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(c)(ii)	$CaO + H_2O \rightarrow Ca(H0)_2$ • reactant formulae • product formula	Allow $Ca(H0)_2$ max 1 if any incorrect attempt to balance	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)(iii)	an explanation linking **two** of the following • (calcium hydroxide) alkaline / base / alkali (1) • **neutralises / neutralisation** (1) • (applied to) acid(ic) (soil) (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)	D		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)	an explanation linking the following • decomposition /break down of {compound / substance / electrolyte}(1) • using electricity / electrical energy / d.c supply (1)	do not allow first point if mention of covalent molecule, substance etc. note examples in spec are water and Hydrochloric acid	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(c)	Cl_2 + 2NaOH → NaOCl + NaCl + H_2O • reactant formulae (1) • product formulae (1) • balancing correct formulae (1)	allow multiples	**(3)**

Question Number		Indicative Content	Mark
QWC	***5(d)**	an explanation linking some of the following: **cause of acid rain** • burning sulfur • produces sulfur dioxide • escapes into atmosphere • dissolves in rain water • forming acidic solution / sulfurous / sulfuric acid • falls to the ground as acid rain **effect of acid rain** • acidification of lakes • kills fish • kills trees / forests • damage / erosion of stonework **reduction of damage** • calcium carbonate • from limestone • may be converted into calcium hydroxide • waste gases from power stations • passed through carbonate or hydroxide • removing sulfur dioxide some of the above points could be made using word or symbol equations	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation e.g. when fuels burn the sulfur makes sulfur dioxide that causes acid rain • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple explanantion e.g. when the fuel burns, sulfur impurities make sulfur dioxide which gives acid rain. Acid rain reacts with limestone statues. • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed explanation e.g. when fuels burn, any sulfur impurities burn to make sulfur dioxide which dissolves in rain to make it more acidic. This rain corrodes metals and limestone. The problem can be solved by removing sulfur from the fuels • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Question Number	Answer	Acceptable answers	Mark
6 (a)	D		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)	An explanation linking the following • carbon dioxide / water vapour (released into the atmosphere) (1) • absorbs OWTTE heat (radiated from Earth)(1)	Ignore reference to greenhouse gases or global warming Mention of ozone layer forbids award of second point	**(2)**

Question Number	Answer	Acceptable answers	Mark
6 (c)(i)	(biofuels) renewable / plants remove carbon dioxide from atmosphere / conserves fossil fuels	(almost) carbon neutral ignore biofuels don't run out the word sustainable must be explained to score	**(1)**

Question Number	Answer	Acceptable answers	Mark
6 (c)(ii)	an explanation linking the following • (growing crops for biofuels) requires land (1) • less land for food production / less food / deforestation / destroys habitat / food prices increase (1)	ignore cost of biofuels v fossil fuels note biofuels are crops so food crops must be specified	**(2)**

Question Number		Indicative content	Mark
QWC	*6(d)	an explanation linking some of the following: **Production** • lack of / insufficient oxygen • {blocked burner jets / poor servicing} leads to lack of oxygen • poor ventilation leads to lack of oxygen • complete combustion cannot take place **Product** • produces carbon / soot • produces carbon monoxide **Effects** • wastes fuel • soot stains / damages decorations etc • soot causes health problems • soot may block gas jets • carbon monoxide is toxic • combines with haemoglobin / forms carboxyhaemoglobin • prevents blood carrying oxygen • no oxygen reaches cells / no respiration / death	**(6)**
Level	**0**	No rewardable content	
1	**1-2**	• a limited explanation e.g. in limited air carbon monoxide forms • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, puncuation and grammar are used with limited accuracy	
2	**3-4**	• a simple explanation e.g. 'incomplete combustion of methane is caused by lack of oxygen and forms carbon monoxide which is a toxic gas' • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• a detailed explanation e.g. 'if a room is poorly ventilated, the heater will have a limited supply of air causing incomplete combustion. Carbon monoxide gas is formed. Carbon monoxide combines with haemoglobin and is therefore toxic' • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

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