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Mark Scheme (Results)

Summer 2014

Pearson Edexcel GCSE in Chemistry (5CH1H) Paper 01

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Question Number	Answer	Acceptable answers	Mark
1(a)	C oxygen other gases nitrogen		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(i)	A description to include • Photosynthesis /absorb carbon dioxide and releases oxygen (1) • (green) plants (1)	reject respiration for photosynthesis ignore breathe in carbon dioxide ignore breathe out oxygen	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)(ii)	A description to include second marking is dependent on the first • a glowing splint (1) • relights (1)	smouldering splint reject a blown out splint lit splint glows brighter (2)	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(c)(i)	to ensure all the oxygen is removed/to ensure the oxygen is completely removed	ignore ensure all the air is removed	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(c)(ii)	An explanation linking • measure the volume of gas in the syringe at the end of experiment (1) • subtract from {100 cm^3 / original volume} to give volume of oxygen (1)	e.g. 100-79 (= 21 cm^3)	**(2)**

(Total for question 1 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	**C** $CaCO_3$		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	making {glass / concrete / cement / quick lime} / aggregates in road making / extracting iron / neutralising {soil / lake} acidity / neutralising acidic gases in power stations	building materials but not buildings ignore statues	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)(iii)	A description linking • heat (1) • pressure (1)	compressed/squashed/compacted	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	crystals at A smaller / crystals at B larger / crystals at A small **and** crystals at B big (1)	intrusive rocks form larger crystals/extrusive rocks form smaller crystals	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	A cooled faster /B cooled slower / A cooled fast **and** B cooled slowly (1)		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(c)	$CaO + H_2O \rightarrow Ca(OH)_2$ (2) LHS (1) RHS (1)	correct multiples ignore state symbols Allow (1) for correct formulae in unbalanced equation	**(2)**

(Total for question 2 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
3(a)	**B** the ease of ignition decreases		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)	A description linking either • {carbon monoxide / CO} (1) • is toxic / poisonous (1) or • {carbon / soot / C} (1) • causes respiratory problems /particles blocks jets (1)	 can kill combines with haemoglobin(in place of oxygen) blackens buildings	 **(2)**

Question Number	Answer	Acceptable answers	Mark
3(c)(i)	An explanation linking any two of • greenhouse gas (1) • traps heat (in atmosphere) (1) • may lead to increased (global) temperature / global warming (1)	 (increased) greenhouse effect traps infra-red radiation **reject** references to UV increased of global warming e.g climate change **reject** references to ozone layer	 **(2)**

Question Number	Answer	Acceptable answers	Mark
3(c)(ii)	An explanation linking three from • (sulfur reacts/combusts/burns) with {oxygen/air} (1) • (forms) sulfur dioxide (1) • sulfur dioxide {dissolves/reacts} in {rain/water/clouds} / sulfur dioxide forms acid rain (1) • (acid rain) causes damage to buildings/plants/kills fish in lakes (1)		**(3)**

Question Number	Answer	Acceptable answers	Mark
3(d)	A description including two of the following • biofuels are renewable / fossil fuels are finite/biofuels are sustainable /biofuels will not run out (1) • biofuels are produced from plants (1) • growing plants remove carbon dioxide from the atmosphere (1) • reduces demand for fossil fuels (1) • biofuels do not contain impurities such as sulfur (1)	reject biofuels are reusable ignore carbon neutral alone ignore references to cost	**(2)**

(Total for question 3 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	A explanation linking the following • contains carbon (atoms) and hydrogen (atoms) (1) • <u>only</u> (1) • <u>all</u> single bonds/no double bonds (1)	reject carbon molecules and hydrogen molecules ignore no spare bonds	**(3)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	**A** remains orange		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	cracking		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	any two reasons from insufficient petrol / supply (from crude oil) (1) higher demand for petrol (1) more fuel oil fraction than needed (1) petrol is more useful than fuel oil (1)	not enough petrol too much fuel oil	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)	$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ (3) LHS (1) RHS (1) balancing correct formula (1)	correct multiples ignore state symbols	**(3)**

(Total for question 4 = 10 marks)

Question Number	Answer	Acceptable answers	Mark
5(a)	magnesium nitrate water carbon dioxide all three correct (2) magnesium nitrate + one other correct (1)	allow correct formulae	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(b)(i)	C – neutralisation		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)(ii)	$ZnO + 2HCl \rightarrow ZnCl_2 + H_2O$ (3) LHS (1) RHS (1) balancing of correct formula (1)	correct multiples ignore state symbols	**(3)**

Question Number		Indicative Content	Mark
QWC	***5(c)**	A description including some of the following points experiment set up • hydrochloric acid in container • carbon rods in acid • attach rods to electrical supply • d.c. supply(or reference to positive and negative) • test tubes to collect gases test hydrogen • lighted splint • squeaky pop (with air)/burns test chlorine • (damp blue) litmus paper • (turns red then) bleaches/white	**(6)**
Level	**0**	No rewardable content	
1	**1 – 2**	• a limited description e.g. simple description/diagram of electrolysis set up OR description of test for one of the gases. • 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 description e.g. a full description of electrolysis OR test for both gases OR simple description of electrolysis and the test for one of the gases. • 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 description e.g. description of electrolysis and test for both gases OR a full description of electrolysis and of one gas test. • The answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

(Total for question 5 = 12 marks)

Question Number	Answer	Acceptable answers	Mark
6(a)	**B** tin oxide is reduced		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)(i)	An explanation linking two of the following • alloys have different sized atoms • {atoms/layers/sheets/particles} {slide/slip/move} over each other (easily) in pure metal • {structure/layers} disrupted (in alloy) • stop {atoms/layers/sheets/particles} {sliding/slipping/moving} over one another (easily) in	suitable labelled diagrams reject molecules once	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)(ii)	all points plotted correctly (1) best fit line across 4 plotted points (1)	+/- 1 small square	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b) (iii)	Correct value from their graph +/- one small square (%)		**(1)**

Question Number		Indicative Content	Mark
QWC	***6(c)**	An explanation including some of the following points gold • gold is an unreactive metal/at the bottom of the reactivity series • it does not combine with other elements in the Earth's crust • so is found as uncombined metal • cost of recovery is low iron • iron is a more reactive metal than gold and less reactive than aluminium/middle of reactivity series • found combined with other elements • it is extracted by heating with carbon • electrolysis can be used • but electrolysis is more expensive (than heating with carbon) aluminium • aluminium is a very reactive metal/near to top of the reactivity series • found combined with other elements • it is extracted by electrolysis • because it is very difficult to reduce • electrolysis is a powerful method of reduction • use of electricity makes this method expensive	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description e.g. a simple justification in terms of reactivity or cost for how one of the metals is extracted OR an indication of how two of the metals are extracted • 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 description e.g. a simple indication of how all three metals are extracted OR an indication of how two of the metals are extracted with a justification in terms of reactivity or cost for one • 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 description e.g. indicates how all three metals are extracted with a justification for at least two in terms of reactivity and a reference to cost • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

(Total for question 6 = 12 marks)

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