edexcel

Mark Scheme (Results)

Summer 2015

Pearson Edexcel GCSE in Chemistry (5CH1F) Paper 01
Unit C1: Chemistry in Our World

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Quality of Written Communication

Questions which involve the writing of continuous prose will expect candidates to:

- Write legibly, with accurate spelling, grammar and punctuation in order to make the meaning clear
- Select and use a form and style of writing appropriate to purpose and to complex subject matter
- Organise information clearly and coherently, using specialist vocabulary when appropriate.

Full marks will be awarded if the candidate has demonstrated the above abilities.

Questions where QWC is likely to be particularly important are indicated (QWC) in the mark scheme, but this does not preclude others.

Question Number	Answer	Acceptable answers	Mark
1(a)	A description including two from • (molten / liquid) magma/lava (1) • (magma/lava)cools (1) • solidifies (1)	 Allow {molten/liquid} rock crystallises ignore hardens	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)	**B**		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(c)(i)	calcium carbonate → calcium oxide + carbon dioxide (2)	LHS (1) RHS (1) Correct formula	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(c)(ii)	A description including any **two** of • cracks (1) • crumbles / breaks up (1) • steam formed (1) • fizzes /effervesces (1) • white powder / paste(1)	 allow swells/expands/erodes allow smoke allow bubbles ignore dissolves ignore heat given off / temperature rises	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(d)	marble (1)		**(1)**

Total for Question 1 = 8 marks

Question Number	Answer	Acceptable answers	Mark
2(a)	**D** gases from volcanoes		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	**A** less than 1%		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	CO_2	CO must be capitals Reject Co 2 must be subscript	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(iii)	An explanation linking any two from **EITHER** • photosynthesis(1) • in (green) plants (1) • (carbon dioxide) absorbed (1) **OR** • (carbon dioxide) is soluble (in water) / dissolves (1) • in oceans (1)	Reject respiration Ignore breathe in (carbon dioxide) reference to formation of skeletons / carbonate rock	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(b)(iv)	burning fossil fuels / burning {petrol / fossil fuel} (in vehicles) /deforestation	ignore cars/driving unqualified allow breathing / respiration	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(v)	a description linking second marking point is dependent on first • limewater • (turning) cloudy/milky/white ppt		**(2)**

Total for question 2 = 8 marks

Question Number	Answer	Acceptable answers	Mark
3(a)	to kill bacteria (1)	to kill microorganisms /pathogens / maintain the correct acidity / lower pH ignore kills germs ignore acid indigestion	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(b)	**B** neutralise the excess acid		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(c)	**A** magnesium chloride		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(d)(i)	An explanation including • decomposing / breaking down of (compounds) (1) • using electrical energy / electricity /direct current /d.c. supply (1)	 allow 'splitting up' ignore 'separate' reject breaking down of elements	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)(ii)	A description including • (damp blue) litmus • turns (red then) white / bleached	use of any suitable indicator (1) with correct result (1) eg universal indicator paper is bleached (2)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)(iii)	An explanation including any two of • (chlorine) could escape/leak (1) • (chlorine is) toxic / corrosive / poisonous (1) • an effect on people eg death / injury / damage lungs /damage eye	 Ignore 'chlorine is dangerous' Allow harmful to people	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)(iv)	Any one of • (to make) plastics / PVC / bleach • to purify / sterilise water	 Ignore '(cleans) swimming pools'	**(1)**

Total for Question 3 = 10 marks

Question Number	Answer	Acceptable answers	Mark
4(a)(i)	ethanol	C_2H_5OH / C_2H_6O / CH_3CH_2OH Do not allow superscript numbers in formula or non-capitals	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(ii)	ethene	C_2H_4 / CH_2CH_2 Do not allow superscript numbers in formula or non-capitals	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(a)(iii)	ethene	C_2H_4 / CH_2CH_2 Do not allow superscript numbers in formula or non-capitals	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)	a description linking • bromine water is/starts orange (1) • (alkene) bromine water turns colourless/decolourises (1) • (alkane) bromine water remains/stays orange / no change (1)	allow red/brown/yellow for colour of bromine water ignore clear ignore discoloured	**(3)**

Question Number	Answer	Acceptable answers	Mark
4(c)	• non-stick/slippery (1) • high melting point / does not melt during cooking (1)	easy to clean does not react with food/does not corrode / non-toxic	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(d)	an explanation linking **EITHER** • non-biodegradable/do not rot/persist/remains for many years • fills/takes up space in landfill site • (may) harm animals **OR** Second mark is dependent on first • if disposed of by burning • produce toxic / harmful products		**(2)**

Total for Question 4 = 10 marks

Question Number	Answer	Acceptable answers	Mark
5(a)	**C** produce heat energy when they burn		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)(i)	hydrogen + oxygen → water LHS (1) RHS (1)	Correct formula Allow hydrogen oxide	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(b) (ii)	does not produce harmful {gases / products} /water produced can be used to make more hydrogen/ only produces water/renewable/does not produce carbon dioxide	Answer must imply/refer to hydrogen	**(1)**

Question Number	Answer	Acceptable answers	Mark
5(b)(iii)	an explanation linking **EITHER** • escaping/leaked hydrogen (mixes with oxygen or air) • (if ignited), will explode **OR** • hydrogen is a {colourless/odourless} gas • leaks possible / undetectable **OR** • hydrogen expensive to produce • electricity needed / expensive **OR** • hydrogen has to be stored in strong / heavy tanks in the car • heavy tanks cause use of more fuel / are expensive **OR** • fewer hydrogen pumps/stations • difficult to refuel **OR** • high pressure needed • {storage/transport} is difficult/ hydrogen has to be stored in strong / heavy tanks	ignore flammable/dangerous ignore references to cost unless qualified	**(2)**

Question Number		Indicative Content	Mark
QWC	***5(c)**	description including some of the following points advantages • (the source) renewable / sustainable • photosynthesis (in plants) uses up carbon dioxide • photosynthesis (in plants) produces oxygen • no net increase in carbon dioxide • conserves petrol/crude oil • no sulfur impurity to remove from the bioethanol • do not release sulfur dioxide disadvantages • growing plants use up land • land could be used for food crops • loss of biodiversity/animal habitats • low yield of bioethanol from plants ignore 'carbon neutral' ignore references to cost ignore biofuels are reusable ignore references to acid rain ignore biofuels are used up quicker	**(6)**
Level	**0**	No rewardable content	
1	**1 – 2**	• a limited description of one advantage or disadvantage • 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 of an advantage and a disadvantage or a detailed description of one advantage or disadvantage or two advantages or two disadvantages. • 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 of a number of advantages and disadvantages • 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)	ores (1)	metal ores	**(1)**

Question Number	Answer	Acceptable answers	Mark
6(b)	iron oxide + carbon → iron + carbon {dioxide / monoxide} (2) LHS (1) RHS (1)	Correct formula	**(2)**

Question Number	Answer	Acceptable answers	Mark
6(c)	• to {increase/higher/raised} strength (1) • to {increase/higher/raised} resistance to rusting (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
6(d)	**A** oxidised		**(1)**

Question Number		Indicative Content	Mark
QWC	***6(e)**	A description including some of the following points • gold is least reactive • gold is placed in the lowest position • electricity needed to extract aluminium • reduction / extraction • electricity is the most powerful method (of extraction) • aluminium is very reactive / most reactive • aluminium is more reactive than carbon • aluminium is placed in the highest position • carbon is more reactive than iron • (hot) carbon reduces iron oxide • (hot) carbon does not reduce aluminium oxide • iron less reactive than aluminium / ORA • iron is not (commonly) found as uncombined metal • iron is more reactive than gold • iron is placed in the middle position	**(6)**
Level	**0**	No rewardable content	
1	**1 – 2**	• a limited description e.g. metals placed in correct positions without explanation / one metal placed in the correct position with explanation • 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 explanation e.g. metals placed in correct position and explanation given for one of them / explanations given for relative reactivity of two metals • 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 metals placed in correct position and explanation for at least two of them. • 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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