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Mark Scheme (Results)

Summer 2013

GCSE Chemistry (5CH1F)
Paper 01

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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.
- For questions worth more than one mark, the answer column shows how partial credit can be allocated. This has been done by the inclusion of part marks eg (1).
- 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)(i)	electrolysis	Allow any phonetically correct spelling	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	A description including **two** of the following • Burns/ ignites (1) • Squeaky (1) • pop/explodes (1) • water formed (1)	Ignore references to splint	**(2)**

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

Question Number	Answer	Acceptable answers	Mark
1(b)(ii)	**C** calcium carbonate		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(iii)	An explanation linking **two** of the following • alkali/ base (1) • (remedy) reacts with/ reduces/ removes (acid) (1) • (that is in) excess (1) • neutralises (acid) / pH raised/ forms water (1) • pain {removed/relieved} (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
1(c)	magnesium nitrate / $Mg(NO_3)_2$ (1) water /H_2O (1)	Reject hydrogen oxide	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(i)	An explanation linking **two** of the following • copper reacts/ combines with/ added to (1) • **oxygen** (reacts/ removed/ decreased) (1)	Allow **copper** absorbs/ takes in **oxygen** for 1 Copper oxide formed / copper oxidised allow 2	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(a)(ii)	C 21		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(i)	B carbon dioxide		**(1)**

Question Number	Answer	Acceptable answers	Mark
2(b)(ii)	An explanation linking **three** of the following • {the Earth / atmosphere} cooled (1) • water vapour condensed • {liquid/ water/ rain} formed (1) • produced {sea/oceans}(1)		**(3)**

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	Carbon Exact spelling only	Ignore C	**(1)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	Electricity	Allow any phonetically correct spelling	**(1)**

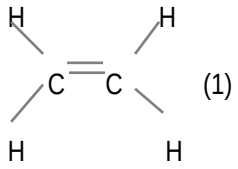
Question Number	Answer	Acceptable answers	Mark
3(b)	An explanation linking • lead oxide loses **oxygen**(1) • carbon gains **oxygen** (1)	**oxygen** {moved /transferred} from lead to carbon (2) oxide transferred gets no credit	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(c)	An explanation linking two of • <u>both</u> good conductors of electricity (1) • (aluminium) has low(er) density (1) • so <u>cables</u> lighter • (therefore) fewer pylons (1)	Allow light(er)	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(d)	D more resistant to corrosion		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(e) (i)	62.5 - 63 Allow anywhere in this range		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(e)(ii)	A description including • decreases first (1) • then increases (1)	"decreases then increases" scores 2 decreases or increases alone scores 0	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(a)	 (1) Propene (1)	Allow $CH_2=CH_2$ Allow prope(e)n(e) only	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(b)(i)	(molecule contains a) **double** bond	multiple bond(s) ignore spare bonds	**(1)**

Question Number	Answer	Acceptable answers	Mark
4(b)(ii)	(colour change) from orange (1) to colourless (1)	red/yellow/brown decolorised ignore clear/ discoloured	**(2)**

Question Number	Answer	Acceptable answers	Mark
4(c)	**1st mark** long {molecules/ hydrocarbon / alkane/ chain} **or** break down/ decompose/ split (1) **2nd mark** into smaller {molecules / alkane / alkene / hydrocarbon/ chain} **or** more useful product		**(2)**

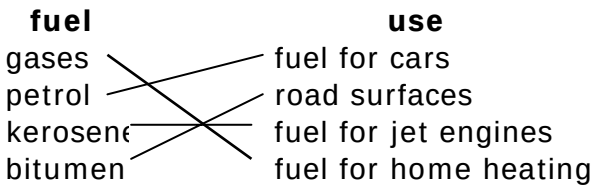
Question Number	Answer	Acceptable answers	Mark
4(d)(i)	**D** polymerisation		**(1)**

Question Number	Answer	Acceptable answers	Mark
4(d)(ii)	An explanation linking **two** of the following • poly(ethene) does not rot/biodegrade (1) • remains for many years in landfill/ fills up land(fill) (1) • (may) harm animals / landfill unsightly (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
5(a)	An explanation linking the following • (compound of) carbon and hydrogen (1) • only (1)	Ignore C, H Do not allow mixture of carbon and hydrogen 2nd mark dependant on 1st	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(b)	**C** heat energy		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(c)	**fractional distillation**		**(1)**

Question Number	Answer	Acceptable answers	Mark
5(d)	3 correct – 2 marks 1 or 2 correct – 1 mark  		**(2)**

Question Number		Indicative Content	Mark
QWC	***5(e)**	An explanation including some of the following **water** • causes condensation • damp walls etc • damages decoration • greenhouse gas/ keeps in heat **carbon dioxide** • greenhouse gas/ keeps in heat • may contribute to global warming • consequences of global warming eg flooding/ drought / crop failure / disease/ melting ice caps / climate change etc **carbon** • soot • makes things dirty/ black • damages decoration • flues or jets could be blocked • can cause breathing problems • can cause fires **carbon monoxide** • toxic (ignore harmful etc) • (also) odourless and colourless • "silent killer" • (therefore) difficult to detect • combines with haemoglobin • in red blood cells • prevents oxygen being circulated In general references to pollution, environment etc are ignored	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description (about one product) e.g. carbon monoxide is toxic because it joins to blood • 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 (developed description of one product) eg carbon dioxide absorbs sun's heat and causes global warming which means ice caps melt **or** (limited description of two) e.g. carbon monoxide combines with haemoglobin so is toxic and carbon dioxide is a greenhouse gas causing global warming. • 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 (developed description of one and limited description of one) or (limited description of three or more) e.g. toxic carbon monoxide cannot be detected and prevents the blood from carrying oxygen so is toxic: carbon dioxide is a greenhouse gas	

		which causes global warming. • 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)	An explanation linking **two** of the following • suck back/ liquid into tube (1) • limewater (into test tube) (1) • as gas cools (1) • (it) contracts (1) • (test tube) {cracks/breaks} (1)		**(2)**

Question Number	Answer	Acceptable answers	Mark
6(b)	no carbon dioxide (formed) / sodium carbonate {not decomposed/ does not react} / not hot enough (for decomposition)		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(c)	C thermal decomposition		**(1)**

Question Number	Answer	Acceptable answers	Mark
6(d)	copper carbonate → copper oxide + carbon dioxide (2)	Either product on RHS of equation = 1 Fully correct = 2	**(2)**

Question Number		Indicative Content	Mark
QWC	***6(e)**	An explanation including some of the following **calcium carbonate / limestone** • for buildings • making roads • treating acid soil/ treating acid lakes • in power station chimneys • making cement • making concrete and mortar • making glass • extracting iron • heating (to make calcium oxide) • making sodium carbonate • as a filler in plastics and paper • in paints • toothpaste • gravestones • statues, decorative stonework • indigestion remedies • railway ballast • bread making **calcium oxide** • treating acid soil • in power station chimneys • making calcium hydroxide (when water added) **calcium hydroxide** • treating acid soil • making limewater	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description (only one product need be mentioned) e.g. limestone is used to build houses and to make cement. • 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 (limited mention of two products **or** more developed mention of one) e.g. limestone is used to make cement, glass and (in the manufacture of) iron where it forms slag. • 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 (limited mention of all three products **or** developed mention of one and limited mention of one) e.g. limestone is used for roads and to make cement: it is also heated to make calcium oxide which is used to treat acid soil. • 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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