

Mark Scheme (Results)

November 2012

GCSE Chemistry  
5CH2F/01

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Publications Code UG034054

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Question Number	Answer	Acceptable answers	Mark
<b>1(a)</b>	exothermic	exthermic exothermal	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)</b>	(iron +) oxygen (1) → iron oxide (1)	accept ironoxide (one word) ignore heat ignore (III) and (II)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(c)</b>	B a catalyst		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(d)</b>	A description including any two of  temperature (1)  falls /decreases / lowers (1)  crystals disappear (1)  solution (formed) (1)	reading on thermometer  water becomes colder  ignore dissolves  ignore fizzing and any other incorrect observations	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(e)</b>	crystals: crushed / powdered / use smaller crystals (1)  water: heat / stir faster (1)	break down (crystals) increase surface area larger surface area ignore reference to change in mass  increase its temperature boil ignore reference to change in volume	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(i)</b>	B calcium nitrate		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(ii)1</b>	A suggestion to include two from:  the reaction was incomplete (1)  unwanted reaction(s) / side reactions took place (1)  some was lost (in transfer) / left in the beaker (1)  some of the solid remained on the filter paper (1)	ignore some of reactant solutions lost  spillage washed away  lost in filtering	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(ii)2</b>	3.0/4.0 (1) (any fraction) X 100 (1) (= 75 %)	3/4 75(%) only scores 2 marks	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)(i)</b>	108 + 35.5 (1) (= 143.5)	143.5 with no working scores the mark	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)(ii)</b>	108/answer to (b)(i) (1) (any fraction) X 100 (1) (= 75.261 %) x 100 (1)	If no working allow 2 marks for 75 or 75.3 or 75.2 or 75.26 or 75.261 (%)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)</b>	B group 1		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)</b>	Rb / Cs / Fr	ONLY reject RB, CS, FR reject rb, cs, fr	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(c)</b>	<b>one</b> line from alkali metals to soft and low melting points (1)  <b>one</b> line from transition metals to strong and high melting points (1)	if more than one line from alkali metals box then 0 mark  if more than one line from transition metals box then 0 mark	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(d)(i)</b>	Any one of the following points  use small piece of potassium (1)  use (safety) screen /shield (1)  make sure students safe distance away (1)	drop at arm's length  description of screen  teacher steps away (after dropping potassium)  wear gloves  ignore tongs ignore fume cupboard	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(d)(ii)</b>	(potassium hydroxide) aq (1) (hydrogen) g (1)	capital letters	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(d)(iii)</b>	A description including any two of effervescence / fizzing / bubbles (1) potassium floats / on surface (1) moves (1) potassium forms ball / sphere (1) potassium disappears / becomes smaller(1) flame (seen) (1)	ignore cloudy/white trail ignore reacts  ignore dissolve  catches fire ignore smoke ignore references to use of / result of adding indicator (to the water)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(d)(iv)</b>	2 (1) 2 (1)	reject multiples of equation	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(a)</b>	A description to include  neutrons in nucleus (1) protons in nucleus (1) electrons in shells / orbits (1)	all marks can be scored from <b>labelled</b> diagram  description of position of particles without use of "nucleus" or "shell /orbit" BUT if description or labels on diagram do not mention "nucleus" <b>or</b> "shell /orbit" at least once then max 2 marks ignore charges / masses / numbers of particles	<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(b)</b>	D 2.8.7		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(i)</b>	an explanation linking  outer {shell / orbit} (electrons) (1)  7 / same number (of electrons) (1)	one / same number of electrons short (of next noble gas)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(ii)</b>	a description to include  (dark) red (1)  liquid (1)	red-brown / brown-red  ignore any references to vapour	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(d)</b>	<p>An explanation linking any two of</p> <p>nucleus very small (by comparison with atom) / atom very large compared to nucleus / most of atom consists of empty space (1)</p> <p>most particles {miss nucleus / go straight through (atom)} / only a few particles (1 in 20 000) {pass close to / hit} nucleus (1)</p> <p>(gold) nuclei positive / both (nucleus and particles) {positively charged / have same charge} (1)</p>		<b>(2)</b>



Question Number	Answer	Acceptable answers	Mark
<b>5(a)(i)</b>	covalent		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(ii)</b>	HCl	ClH ignore subscript 1 after either or both atoms  ignore any working	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(iii)</b>	C has a low boiling point		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(b)</b>	$H_2 + F_2 \rightarrow 2 HF$ correct formulae on correct sides of equation (1) balancing correct formulae (1)	accept = for $\rightarrow$ multiples reject f for F and h for H BUT allow mark for balancing completely correct equation but reversed scores 1 mark	<b>(2)</b>

Question Number	Indicative Content	Mark
<b>QWC</b>	<p><b>*5(c)</b></p> <p>A description including some of the following points</p> <p><b>molecules</b></p> <p>simple / small molecule  separate / discrete molecules  covalent bonds (between atoms in molecule)  displayed structure for CH<sub>4</sub>  weak forces between molecules</p> <p><b>properties</b></p> <p>to boil need to separate molecules  little energy needed (as weak forces between molecules)  therefore low boiling point</p> <p>to be able to conduct must have charged particles  which must be free to move  no charged particles present  no delocalised /free electrons / no ions present  all electrons are in covalent bonds  therefore does not conduct electricity / cannot carry  current</p>	<b>(6)</b>
<b>Level</b>	<b>0</b>	No rewardable content
<b>1</b>	<b>1 - 2</b>	<p>a limited description  e.g. methane is a simple / small molecule  e.g. weak forces between molecules  the answer communicates ideas using simple language and uses limited scientific terminology  spelling, punctuation and grammar are used with limited accuracy</p>
<b>2</b>	<b>3 - 4</b>	<p>a simple description  e.g. methane is a simple / small molecule with weak forces between molecules (so low boiling point)</p> <p>e.g. {it is covalent / there are no charged particles (ions or free electrons)} to move and carry the current</p> <p>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</p>
<b>3</b>	<b>5 - 6</b>	<p>a detailed description  e.g. methane is a simple / small molecule with weak forces between molecules (so low boiling point) AND any mention of lack of charged particles</p> <p>e.g. does not conduct electricity because {it is covalent /there are no charged particles (ions or free electrons)} to move and carry the current AND any mention of separate molecules or weak forces between them</p> <p>the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately  spelling, punctuation and grammar are used with few errors</p>

Question Number	Answer	Acceptable answers	Mark
<b>6(a)</b>	An explanation linking the following  two elements / magnesium and oxygen (1) combined / bonded/(chemically) joined together (1)	ignore mixture ignore reacted together ignore type of bond	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)(i)</b>	two electrons in first shell and eight in outer shell	dots or crosses or combination of both	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)(ii)</b>	An explanation including two of the following points  idea of electron(s) transfer in correct direction (1)  two (electrons transferred) (1)	marks can be scored in a diagram  any indication of covalent bonding / electron sharing scores 0	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)(iii)</b>	A has a high melting point		<b>(1)</b>

Question Number	Indicative Content	Mark
QWC	<p data-bbox="248 327 363 365"><b>*6(c)</b></p> <p data-bbox="384 327 1166 365">A description to include some of the following points</p> <p data-bbox="384 398 555 436"><b>flame test</b></p> <p data-bbox="485 472 1059 685">           use a wire / splint            concentrated hydrochloric acid / water            dip in solid            put in flame            gives a colour (to flame)            yellow (flame)         </p> <p data-bbox="384 719 1102 757"><b>NB Only ONE of salts needs to be identified</b></p> <p data-bbox="384 790 655 828"><b>test for chloride</b></p> <p data-bbox="485 864 868 1010">           dissolve salt in water            add dilute nitric acid            add silver nitrate solution            white precipitate formed         </p> <p data-bbox="384 1043 687 1081"><b>test for carbonate</b></p> <p data-bbox="485 1117 916 1330">           add dilute acid (to solid)            effervesces / fizzes / bubbles            (pass) gas (given off)            (into) limewater            turns milky / cloudy / white            (so) carbon dioxide (formed)         </p>	(6)

<b>Level</b>	<b>0</b>	No rewardable content
<b>1</b>	<b>1 - 2</b>	<p>a limited description  e.g. put salt in flame  e.g. add acid to (suspected) carbonate</p> <p>the answer communicates ideas using simple language and uses limited scientific terminology  spelling, punctuation and grammar are used with limited accuracy</p>
<b>2</b>	<b>3 - 4</b>	<p>a simple description  e.g. put salt in flame and gives correct colour  e.g. add acid to the carbonate and it fizzes  e.g. add silver nitrate (solution) and white ppt (forms)  e.g. put salt in flame (to show sodium present) and add silver nitrate (solution) to show chloride present</p> <p>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</p>
<b>3</b>	<b>5 - 6</b>	<p>a detailed description  e.g. salt put in flame produces yellow (flame) and when silver nitrate solution added a white precipitate forms with the chloride  e.g. silver nitrate solution to solution of solid gives white ppt showing chloride and sodium salts give yellow flame  e.g. solid on wire / splint put into flame gives yellow colour AND silver nitrate (solution) added shows chloride</p> <p>the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately  spelling, punctuation and grammar are used with few errors</p>

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Order Code UG034054 November 2012

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