

Mark Scheme (Results)

Summer 2012

GCSE Chemistry  
5CH2F/01

## **Edexcel and BTEC Qualifications**

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information, please visit our website at [www.edexcel.com](http://www.edexcel.com).

Our website subject pages hold useful resources, support material and live feeds from our subject advisors giving you access to a portal of information. If you have any subject specific questions about this specification that require the help of a subject specialist, you may find our Ask The Expert email service helpful.

[www.edexcel.com/contactus](http://www.edexcel.com/contactus)

## **Pearson: helping people progress, everywhere**

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at:

[www.pearson.com/uk](http://www.pearson.com/uk)

Summer 2012

Publications Code UG033045

All the material in this publication is copyright

© Pearson Education Ltd 2012

GCSE Chemistry 5CH2F/01 Mark Scheme – Summer 2012

Question Number	Answer	Acceptable answers	Mark
<b>1(a)(i)</b>	A dissolving		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(a)(ii)</b>	A description including the following points <ul style="list-style-type: none"> <li>• thermometer (1)</li> <li>• take temperature before and after (1)</li> </ul>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(a)(iii)</b>	endothermic		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(i)</b>	carbon dioxide	CO <sub>2</sub> reject CO <sup>2</sup> / CO2	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(ii)</b>	faster fizzing / dissolves faster	faster reaction more fizzing	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)(iii)</b>	An explanation including the following points <ul style="list-style-type: none"> <li>• powder them / use smaller pieces (1)</li> <li>• larger surface area (1)</li> </ul>	break them up ignore changes to anything other than marble chips ignore stir	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)</b>	<ul style="list-style-type: none"> <li>• lead nitrate (1)</li> <li>• sodium carbonate (1)</li> </ul>	either order	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)</b>	<p>An explanation including the following points</p> <ul style="list-style-type: none"> <li>• (white) {solid / precipitate / cloudiness} (1)</li> <li>• barium sulfate insoluble (1)</li> </ul>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(c)</b>	(barium sulfate) opaque to X-rays / shows up on X-rays / safe to use because it does not enter blood / is insoluble	shows up stomach etc so X-ray is clearer ignore does not react with body fluids / water / blood	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(d)(i)</b>	<b>C</b> ionic		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(d)(ii)</b>	<b>D</b> 851 °C		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2 (e)</b>	Na <sub>2</sub> CO <sub>3</sub>	CO <sub>3</sub> Na <sub>2</sub>	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(i)</b>	<b>C</b> immiscible		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(ii)</b>	<p>A description including two of the following points</p> <ul style="list-style-type: none"> <li>• open tap (1)</li> <li>• run off lower layer / water (1)</li> <li>• pour off remainder/oil through top of funnel (1)</li> </ul>	<p>let water out stop before oil comes out</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(i)</b>	melts	<p>turns into liquid reject burns</p>	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(ii)</b>	<p>An explanation including <b>two</b> of the following points</p> <ul style="list-style-type: none"> <li>• sand has a giant (molecular), (covalent) structure (1)</li> <li>• strong (covalent) bonds (in sand) (1)</li> <li>• high amounts of energy / heat needed (to break bonds) (1)</li> <li>• (so) high melting point (1)</li> <li>• Bunsen does not get hot enough (1)</li> </ul>	<p>ignore forces</p> <p>(so) melting point 1610 °C (so) does not melt</p> <p>Bunsen cannot reach melting point</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)(iii)</b>	<b>A</b> simple molecular, covalent		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(c)(i)</b>	only one spot / do not separate	reject contain only one colour	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(c)(ii)</b>	<p>An explanation including two of the following points</p> <ul style="list-style-type: none"> <li>• mixture / not pure (1)</li> <li>• (contains) X / blue (dye)(1)</li> <li>• (contains) Y / yellow (dye)(1)</li> </ul>	contains two dyes	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(a)</b>	An explanation including <b>two</b> of the following points <ul style="list-style-type: none"> <li>• electrons shared (1)</li> <li>• pair (of electrons)(1)</li> <li>• hydrogen (atom) and oxygen (atom) each supply one electron (to shared pair)</li> </ul>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4 (b)</b>	$(2 \times 1)(1) + 16 (1) = 18$	18 (2) 17 (1)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(i)</b>	$2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ <ul style="list-style-type: none"> <li>• reactant formulae (1)</li> <li>• product formula (1)</li> <li>• balancing correct formulae (1)</li> </ul>	reject $\text{O}^2 \text{H}^2$ reject $\text{H}^2\text{O} \text{H}_2\text{O}$	<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(ii)</b>	$\frac{2}{4} (1) \times 100 (\%) (1) (=50\%)$	$0.5 / \frac{1}{2} (1)$  50(%) (2) 200% (1)	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)(iii)</b>	reaction incomplete / losses (during reaction) / spillages (during reaction)	(water) evaporated { water /steam / oxygen / hydrogen /gas} escaped / lost / leaked less hydrogen burned than expected not all hydrogen burned not enough oxygen present (for all hydrogen to burn) reject unwanted / unexpected reactions occurred	<b>(1)</b>

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

Question Number	Answer	Acceptable answers	Mark
<b>5(b)</b>	they are in same group / group 1/(both) have one outer electron	both alkali metals	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(c)</b>	An explanation including the following points <ul style="list-style-type: none"> <li>elements in same group have similar properties (1)</li> <li>so looked at elements { above /below / in group 3} (1)</li> </ul>	across a period elements show gradual / regular variation in properties	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(d)</b>	An explanation including the following points <ul style="list-style-type: none"> <li>two places further on (in period) (1)</li> <li>(so) <math>29 + 2 (=31) / 31</math> (1)</li> </ul>	in each successive element (in period) one more (proton) /atomic number increases by one  31 with no explanation (1)	<b>(2)</b>



Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*5(e)</b>	<p>A description including some of the following points</p> <ul style="list-style-type: none"> <li>• protons in nucleus</li> <li>• 9 protons</li> <li>• neutrons in nucleus</li> <li>• 10 neutrons</li> <li>• electrons in shells</li> <li>• 9 electrons</li> <li>• first shell 2</li> <li>• second shell 7</li> <li>• electronic configuration 2.7</li> <li>• (some or all of this could be shown on a diagram)</li> </ul>	<b>(6)</b>
<b>Level</b>	<b>0</b>	No rewardable content	
<b>1</b>	<b>1 - 2</b>	<ul style="list-style-type: none"> <li>• a limited description e.g. gives the number of protons</li> <li>• the answer communicates ideas using simple language and uses limited scientific terminology</li> <li>• spelling, punctuation and grammar are used with limited accuracy</li> </ul>	
<b>2</b>	<b>3 - 4</b>	<ul style="list-style-type: none"> <li>• a simple description e.g. protons and neutrons in the nucleus and electrons around the nucleus OR e.g. has 9 protons 9 electrons 10 neutrons</li> <li>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately</li> <li>• spelling, punctuation and grammar are used with some accuracy</li> </ul>	
<b>3</b>	<b>5 - 6</b>	<ul style="list-style-type: none"> <li>• a detailed description e.g. gives the electronic configuration and the position of the protons and neutrons OR e.g. has 9 protons (9 electrons) 10 neutrons and gives electronic configuration</li> <li>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately</li> <li>• spelling, punctuation and grammar are used with few errors</li> </ul>	

Question Number	Answer	Acceptable answers	Mark
<b>6(a)</b>	<b>B 1</b>		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)</b>	<p>An explanation including the following points</p> <ul style="list-style-type: none"> <li>• (delocalised) electrons (1)</li> <li>• (electrons) move (through metal structure) (1)</li> </ul>	ions and electrons move worth (1) only	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(c) (i)</b>	yellow	reject orange-yellow etc	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(c) (ii)</b>	<p>A description including the following points</p> <ul style="list-style-type: none"> <li>• make solution of sodium chloride (1)</li> </ul> <p>(add (dilute) nitric acid)</p> <ul style="list-style-type: none"> <li>• when silver nitrate solution added white {solid / precipitate} (formed) (1)</li> </ul> <p><b>OR</b></p> <p>A description including the following points</p> <ul style="list-style-type: none"> <li>• add sodium chloride to silver nitrate (solution) (1)</li> </ul> <p>(add (dilute) nitric acid)</p> <ul style="list-style-type: none"> <li>• white {solid / precipitate} (formed) (1)</li> </ul>	react sodium chloride with silver nitrate	<b>(2)</b>

Question Number	Indicative content	Mark
<b>QWC</b>	<p><b>*6(c) (iii)</b></p> <p>A description including some of the following points</p> <p><b>practical procedure</b></p> <ul style="list-style-type: none"> <li>• burning (sodium)</li> <li>• placed in chlorine in gas jar /conical flask /tall beaker</li> <li>• white (fumes)</li> <li>• (sodium chloride forms) as a solid</li> </ul> <p><b>safety</b></p> <ul style="list-style-type: none"> <li>• done in fume cupboard</li> <li>• (because) chlorine toxic</li> </ul> <p><b>theoretical</b></p> <ul style="list-style-type: none"> <li>• sodium (atoms) lose electrons</li> <li>• one electron</li> <li>• forms sodium ions</li> <li>• Na<sup>+</sup> / with positive charge</li> <li>• chlorine (atoms) gain electrons</li> <li>• one electron</li> <li>• forms chloride ions</li> <li>• Cl<sup>-</sup> / with negative charge</li> <li>• forms NaCl</li> <li>• attraction between opposite charged ions</li> <li>• ionic bond</li> </ul>	<b>(6)</b>
<b>Level</b>	<b>0</b>	no rewardable material
<b>1</b>	<b>1-2</b>	<ul style="list-style-type: none"> <li>• a limited description e.g. put burning sodium in chlorine OR e.g. sodium atoms lose electrons</li> <li>• the answer communicates ideas using simple language and uses limited scientific terminology</li> <li>• spelling, punctuation and grammar are used with limited accuracy</li> </ul>
<b>2</b>	<b>3-4</b>	<ul style="list-style-type: none"> <li>• a simple description e.g. put burning sodium into a gas jar of chlorine in a fume cupboard OR e.g. sodium atoms lose electrons and chlorine atoms gain electrons</li> <li>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately</li> <li>• spelling, punctuation and grammar are used with some accuracy</li> </ul>
<b>3</b>	<b>5-6</b>	<ul style="list-style-type: none"> <li>• a detailed description e.g. put burning sodium into a gas jar of chlorine in a fume cupboard because chlorine is toxic, white solid formed OR e.g. a sodium atom loses one electron which is transferred to a chlorine atom, forms Na<sup>+</sup> and Cl<sup>-</sup> / ionic bond formed</li> <li>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately</li> <li>• spelling, punctuation and grammar are used with few errors</li> </ul>

Further copies of this publication are available from  
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467

Fax 01623 450481

Email [publication.orders@edexcel.com](mailto:publication.orders@edexcel.com)

Order Code UG033045 Summer 2012

For more information on Edexcel qualifications, please visit our website  
[www.edexcel.com](http://www.edexcel.com)

Pearson Education Limited. Registered company number 872828  
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE

Ofqual  




Llywodraeth Cynulliad Cymru  
Welsh Assembly Government

