edexcel

Examiners' Report/ Principal Examiner Feedback

January 2013

International GCSE Chemistry (4CH0) Paper 2C

Edexcel Level 1/Level 2 Certificate Chemistry (KCH0) Paper 2C

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 visit our qualifications websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.
Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson.
Their contact details can be found on this link: www.edexcel.com/teachingservices.

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel username and password to access this service.

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

January 2013
Publications Code UG034325

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

International GCSE Chemistry paper 4CH0 2C

Question 1

Part (a) was generally well answered but some candidates either did not appear know what a bar chart is, or failed to read properly the question, and plotted points.

Part (b) was surprisingly poorly answered. Some candidates used all three states of matter and even aqueous was occasionally seen.

Question 2

Almost all candidates scored two marks for part (a). Most identified B as producing the apparently incorrect result, but a number then went on to state that this was because it did not contain any of the colours blue, red and yellow, despite being told in the question that it did. The most likely explanation for the apparent anomaly is that B contains different shades of two of the three colours.

Question 3

Very few candidates scored both marks in (a)(i). Most lost the first mark for drawing circles where very few were touching one another. Some lost the second mark since the arrangement of the circles displayed a regular pattern.

The most common method of losing the mark in part (ii) was to fail to give a comparison between the packing of the particles in both a liquid and a gas, with a large number of candidates merely stating that, in a liquid, the particles were closely packed.

Very few candidates were able to provide both observations in (b)(i), but the majority scored at least one mark, with 'bright/white flame' appearing most frequently. White precipitate was often seen in place of white solid, but this was not given credit since precipitate has a specific meaning in Chemistry.
The formula of magnesium oxide was well known.

Part (i) of (c) was well answered, but a significant number of candidates who obtained this mark then went on to suggest that it was the magnesium ion that caused the alkalinity of the solution.

Question 4

Most candidates scored at least one mark in part (a) for an observation relating to a gas given off. It should be noted that 'gas produced' is not an observation but a statement of fact. Water and calcium chloride are also produced in this reaction.

The test for carbon dioxide was very well known, but some candidates still insist on stating that the gas extinguishes a burning spill. Many other gases also do not support combustion, so this is not an appropriate test for carbon dioxide.

It was surprising to see 'inversely proportional' commonly given as the answer to (c); the line in this graph does not approach the x-axis asymptotically. Far too many quoted three minutes as the completion time for the reaction when it is very clear from graph that the line has not levelled off until after this time. A pleasing number of candidates recognised that the calcium carbonate was the limiting reactant, but a number of others stated that all of the hydrochloric acid has reacted or that both reactants had been used up.

Part (e) did not produce the number of correct responses expected. It was hoped that candidates would use the equation to recognise that a solution of calcium chloride had been produced. Since the hydrochloric acid was in excess there will always be some (or, more accurately, some hydrogen chloride) in solution, even at the end of the reaction.

On the whole part, 4(f) was well answered. Most candidates realised that if powder was used the curve would be steeper, but some did not appreciate the fact that it would still level off at 98.4

Question 5

5(a) was generally well answered. Most candidates could name the two acids but far fewer realised that silver nitrate was needed for the precipitation reaction. The most common errors were to use silver hydroxide or silver chloride, presumably not realising that silver hydroxide does not exist and that silver chloride is insoluble. It was difficult for candidates not to score marks in the state column, particularly as both alternatives were correct in the bottom box, but a few even managed to lose marks here either by writing 'solid solution', 'liquid' or 'gas'.

By contrast, 5(b) was poorly answered, with only the very best candidates giving a correctly balanced ionic equation. Even though the question specifically asked for the ions formed, many equations did not contain any ions. Other common errors included failing to balance the equation,

including OH^- in the equation or giving the formula of the sulfate ion as SO_4^-.

The question in part (c), on the preparation of lead(II) chloride, was answered well by those candidates who knew how to prepare an insoluble salt, although many of these still lost a mark by failing to state that the salts had, first of all, to be dissolved in water. There was some unnecessary heating mentioned and some candidates thought you had to heat the salts to melt them in order for them to react. Some confused this method with the preparation of a soluble salt and talked about evaporating until the crystallisation point, while others seemed to be doing some kind of titration to react the two solutions. Some candidates added unnecessary substances such as nitric or hydrochloric acid and others just did not have a clue where to start. The words filtrate and residue were sometimes confused, with some candidates washing and drying the filtrate.

Question 6

The equation for the reaction of sucrose with water should have been straightforward since the formulae of two of the three substances involved were given in the question, with only water omitted. However, some candidates still preferred to invent compounds and include them in the equation. Some who got all formulae correct then failed to correctly balance the equation.

Many spotted in (b)(i) that the bubbling would stop to signify the end of the reaction. The need to remove the yeast by filtration was well understood, although a variety of unsuitable methods, including chromatography, were seen.

Part (c) produced many good answers, although the most accurate description of dehydration as removing the elements of water was rarely seen. One of the three acceptable alternatives to the catalyst was given in most cases and many were able to deduce from the two given formulae that chlorine was required to convert ethene into 1,2-dichloroethane. The equation in (c)(iv) was well answered, although some candidates who, perhaps unwisely, decided to change the structural formulae into molecular formulae made mistakes such as C_2H_4Cl instead of C_2H_3Cl.

6(d)(i) was usually answered by the better candidates with no alterations or corrections, but others, at the end of a lot of crossing out, ended up with the incorrect answer. Often extension lines or two chlorine atoms were included.

In 6(d)(ii), most candidates scored some marks as they had the idea that the double bond was broken and that the monomers joined together, although there were quite a few answers which talked about 'free hands' and the like. Although analogies such as these are sometimes useful in visualising concepts in Chemistry, they are of little use in answers to

examination questions. Fewer talked about a long chain being formed and that the polymer contained only single bonds.

Question 7

Question 7(a) proved to be an excellent discriminator with the better candidates completing the calculation perfectly while at the other end of the spectrum those that did not have a clue just used the given numbers randomly, sometimes resulting in answers involving thousands of moles. In the middle there were those who got part way, as they could calculate the moles of carbon dioxide and maybe deduce that this equalled the moles of carbonate, but were not sure what to do next. Some assumed that the answer was going to be calcium, so guessed the answer to (iii) was 100 and worked backwards from there. This at least showed some initiative and that they knew how to do the last part of the calculation.

7(b) was not especially well answered. Some answers were too vague stating, for example, that some gas escaped but not indicating how this may have happened. Others gave irrelevant answers such as the reaction did not go to completion or measurements were not taken properly or too little acid was used. The most common answer which gained credit was, 'some CO_2 dissolved in the water'.

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

Order Code UG034325 January 2013

For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

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

Rewarding Learning