Examiners' Report/
Principal Examiner Feedback

June 2011

International GCSE
Chemistry (4CH0) Paper 1C
Science Double Award (4SC0) Paper 1C

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our website at www.edexcel.com.

If you have any subject specific questions about the content of this Examiners' Report that require the help of a subject specialist, you may find our **Ask The Expert** email service helpful.

Ask The Expert can be accessed online at the following link:
http://www.edexcel.com/Aboutus/contact-us/

Alternatively, you can contact our Science Advisor directly by sending an email to Science specialist on Sciencesubjectadvisor@EdexcelExperts.co.uk.
You can also telephone 0844 576 0037 to speak to a member of our subject advisor team.

(If you are calling from outside the UK please dial + 44 1204 770 696 and state that you would like to speak to the Science subject specialist).

June 2011
Publications Code UG027577

International GCSE 4CH0 & Double Award 4SC0 Paper 1C – Summer 2011

Question 1

As the first questions in this paper were targeted at the lowest grades, high scores in this question were expected from almost all candidates, which was the case. Parts (a) and (b) were invariably correct, although a few seemed reluctant to choose the same particle as the answer to both parts, with a handful choosing neutron as the particle with a negative charge. Almost none chose elements or molecules as their answers in (c), but several errors were seen, especially in the selection of particles for isotopes. In (d)(i) and (ii) 12 and 24 were almost always used as answers, although sometimes the wrong way round. The electronic configuration was very often correct.

Question 2

A handful of candidates did not select their answers from the choices offered, with names such as helium appearing in (a). Otherwise, almost all identified helium and oxygen as elements, although with some confusion evident in (ii) and (iii) between compounds and mixtures. Very few errors appeared in (b).

Question 3

Answers to (a) were usually correct, with 2 and 6 the most likely errors. There were very few all correct answers to parts (b) and (c) and a variety of incorrect ones were seen, especially chlorine in (b) and hydrogen chloride in (c). Perhaps the most unexpected answer was the identification of the white solid as cotton wool. In (d), a few chose only one response instead of two, and quite a number picked either or both of boiling or melting.

Question 4

This question was the first in the paper to be based on a practical technique that candidates are expected to be familiar with; although a small minority of answers suggested that it had not been encountered before, many high scores were seen. A frequent but understandable error was to refer to the food dyes as inks, although this was not penalised. In (a), some correct statements that did not answer the question did not receive credit, such as "so that the water/dyes could rise up the paper". Answers to (b)(i) were usually correct, although common responses in (b)(ii) were "because it only contained one dye" and "because it is denser than water". In (c), some distances were quoted in cm, but in general the distances were accurately recorded. Some examples were seen where two identical distances were recorded, leading to an R_f value of 1, and others were an R_f value greater than 1 was correctly calculated from the distances entered.

Question 5

In (a), 7 was the most common answer to (i), but fewer correct answers were seen to (ii) and (iii) – sometimes the correct names appeared in the wrong places, and astatine (or iodine) was often said to be more reactive than bromine. Part (b)(i) revealed a common problem for candidates – the failure to distinguish between ions and electrons as charge carriers. In (b)(ii), apart from those who referred to oxygen, the main reason why the mark was not scored was the reference to bromine instead of bromide. As both appear in the equation, it is important for candidates to make clear which species is being referred to – ideally bromide or Br^{-} ions (although" bromine ions" was also accepted as being unambiguous). In (b)(iii) a surprising number repeated the equation for electrode A, while most of those who chose lead could not produce a correct equation (starting with Pb^{4+}, electrons being lost, the product shown as Pb_2 were often seen). Many candidates scored full marks (or no marks) in (c). Common errors were the use of atomic numbers instead of atomic masses, using 160 instead of 80 for Br and 32 instead of 16 for O, and doing the division the wrong way round. It was disappointing to see some mathematically correct answers spoiled by the use of S for sodium and B for bromine. When the correct final answer was not shown, it was sometimes difficult to award marks because of poorly set out answers that showed unexplained numbers all over the available space. Candidates should be reminded of the importance of setting out calculations clearly and logically, with a few words to indicate what is being done.

Question 6

Part (a) proved problematic for many; some used formulae instead of words and many omitted the oxidation number of iron, while many precipitates were described as white, and fizzing was a common extra observation. In (b), although the precipitate was often correct, many misinterpreted (ii) and described the limewater test for carbon dioxide. Very few scored full marks in (c); the usual errors were seen – the failure to add an alkali, confusing ammonia and ammonium ions, testing the solution with indicator paper.

Question 7

In (a), although the majority were able to read the scales correctly, there are still those who need more practice in doing so, to avoid 'at start' answers such as 82 and 68. In (b), most plotted the points correctly, but the straight line of best fit proved more difficult. Some were drawn from (140,20) or showed a curve starting from there, although mercifully few joined all the dots. The examiners are aware, from seeing candidates' answers, that some centres train their candidates to draw a line of best fit as a straight line through the centre of a group of data points (a scatterplot). This approach was not credited in the mark scheme. The assessment objectives for this specification emphasise the identification of anomalies and candidates need to make allowances for those anomalies at all times (as they do, for example, when selecting titre values in titrations). Therefore, if there are several points on an (almost) exact straight line and there is one further point that is a long way from the line (an outlier), then the line to draw is the one that goes through the several points, with the outlier being ignored. It was rare for full marks to be scored in (c), but the use of provided words meant that it was not possible to be sure why incorrect choices had been made. The majority did a correct calculation in (d), although with many dividing 111 by 140, and some not giving answers to the required one decimal place.

Question 8

It was hoped that the examples provided in (a) would help candidates in their answers. Although it is likely that many were helped, some were apparently led astray, including double bonds in their formulae. Propane sometimes appeared as CH_2–CH_3–CH_3 and C_3H_8–C_3H_8, and butane sometimes omitted one or two hydrogen atoms (or had only three carbon atoms). In (b), most were able to identify the homologous series, but the general formula was often written carelessly (eg $C_nH_{2n}+2$). Most were able to state at least one correct characteristic, although with the usual errors involving properties (similar physical properties instead of gradation or gradual change in physical properties, gradual change in properties without specifying physical). In (c), although CO_2 and H_2O often appeared in the equation, other substances also did, oxygen was sometimes omitted and balancing was often not attempted or incorrectly done. The majority chose carbon as the solid product, but hydrogen and water often appeared as gaseous products. Few drew two correct and different structures in (d) – perhaps the commonest reasons for scoring one mark was drawing methylbutane twice and repeating pentane with a bent carbon chain. Success in (e) was probably centre-dependent – some candidates seemed familiar with the reaction, while others scored no marks at all.

Question 9

In (a), parts (i)-(iii) were invariably correct, but a variety of other substances appeared, including sulfuric acid. The reason for using cryolite needs to be mentioned. Its primary purpose is to act as a solvent – in a typical cell the concentration of alumina is only about 5%. It is not correct to state that it lowers the melting point of alumina (and certainly not that of aluminium), although alternative answers that were accepted included "to lower the operating temperature" and "to lower the melting point of the electrolyte or mixture". As the statement about lowering the melting point of alumina is a common response that has been accepted in the previous (4335) specification, it is important that candidates are made aware of this change. Part (b) was well answered, and in (ii) most gave either a simple reason (in terms of oxygen transport) or a more detailed explanation (in terms of a reaction involving haemoglobin). Part (c) was rarely answered well. In (i), protons were just as common as ions. In (ii), although the idea of layers sliding often appeared, the particles were either not named or stated to be protons or electrons; some thought that the electrons acted as a lubricant, and intermolecular forces were sometimes mentioned. In (iii) conduction was often explained in terms of moving ions, and in (iv) "light" again appeared instead of "low density".

Question 10

In (a), quite a number identified the insoluble salt as sodium chloride, and the equation rarely scored both marks – silver nitrate often appeared as AgNO or AgN and silver chloride as $AgCl_2$. In (b) it was rare to see all four state symbols correct. Candidates need reminding that state symbols must be unambiguous to score, especially when a symbol is written that could be either s or g. In (c), it was disappointing to find that so many candidates could not identify the acid and alkali needed to prepare sodium nitrate – sodium and sulfuric acid often appeared. The reading of burettes has featured in most 4335/03 papers from 2005 onwards, so it was disappointing to see so many volumes recorded to only one decimal place, especially as the question wording clearly demanded values to the nearest 0.05 cm^3. Requiring the selection and averaging of concordant titration results has also frequently appeared in 4335/03 papers, so it was also disappointing to find so many in (d) who could not identify the concordant results, especially as the concordancy requirement was stated in the question. Part (e) tested another basic practical technique that candidates seemed unfamiliar with. After heating and cooling, to suggest that the next step should be heating is not sensible. It was pleasing to see so many candidates calculating the correct mass in (f), although the usual calculation errors were also seen, including poorly set out working that could often not be followed.

Question 11

Very few scored full marks in (a) – this required a recognition that more energy was given out in bond formation than absorbed in bond breaking. The commonest reason for losing marks was stating that bond making needed energy. Part (b) was fairly well done, although few knew the formula of the hydrated copper(II) sulfate. The main problems in (c) were not knowing the colour of methyl orange in acid and not stating that universal indicator had several colours that depended on pH (not just that it had several colours). Some suggested that universal indicator could be used to distinguish between strong and weak acids, which were not acceptable as an answer to the actual question asked.

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

Further copies of this publication are available from
International Regional Offices at www.edexcel.com/international

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

Alternatively, you can contact Customer Services at
www.edexcel.com/ask or on + 44 1204 770 696

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

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning