edexcel

Examiners' Report/
Principal Examiner Feedback

January 2012

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

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 call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our qualifications website at www.edexcel.com. For information about our BTEC qualifications, please call 0844 576 0026, or visit our website at www.btec.co.uk.

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.

Ask The Expert can be accessed online at the following link:

http://www.edexcel.com/Aboutus/contact-us/

Alternatively, you can speak directly to a subject specialist at Pearson about Edexcel qualifications on our dedicated Science telephone line: 0844 576 0037

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 raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2012
Publications Code UG030276

International GCSE 4CH0 & Double Award 4SC0 Paper 1C – January 2012

Question 1
This was a straightforward question about one method of separating mixtures. The vast majority of candidates scored full, or nearly full, marks. Most errors occurred in (c), where distillation and condensation were sometimes chosen.

Question 2
This question on rusting was correctly answered by most candidates. In (a)(i), even though the question asked for a name, a surprising number of candidates chose to give a formula. Correct formulae (usually Fe_2O_3) were accepted, but incorrect ones (usually FeO) were not. As this question was targeted at candidates expecting to achieve lower grades, "iron oxide" was accepted, but answers that included an incorrect oxidation state (usually iron(II) oxide) were not. In (c)(i), zinc was invariably chosen, but in (c)(ii) the distractors were chosen at least as often as the correct response. As galvanising was the focus of (c), answers to (d) that included galvanising or another unspecified method of sacrificial protection were not accepted, although the list principle was not applied to these.

Question 3
In (a), the formulae of the ions were often well known, although some NH_3^+ and missing charges were seen. Candidates often score poorly in tests for ions, and in this part, some were confused between ammonium ions and ammonia gas or attempted to describe the test for chlorine gas instead of chloride ions. Part (c) was better done, with only a minority of candidates confusing reversibility with equilibrium. Few errors were seen in (d).

Question 4
This question was generally well answered. In (a), some candidates gave an observation about the hydrogen burning, even though the question was about the reaction between magnesium and hydrochloric acid. The magnesium chloride product was invariably correctly identified. Candidates should be aware that the use of "Identify" gives them the option of using a name or a formula; however, incorrect formulae (such as MgCl) are not accepted, even if the correct name also appears. The equation in (b) was well done, with few examples of H, O and OH seen, although several equations were left unbalanced. In (c), full marks were often seen, although a handful of candidates described a chemical test instead of a physical one.

Question 5
Parts (a) and (b) were generally well done, although hydrogen sometimes appeared instead of bromine in the test for unsaturation. Many attempts at the displayed formula in (c) were successful, although some did not have four carbon atoms and rather more had a pentavalent carbon. In (d), the general formula was often correct, although it was disappointing to see many carelessly written attempts (such as C_nH_{2n+2}). The features of a homologous series were often correct. In (e), although some alternative wordings are acceptable, candidates should be aware that "chemical formula" is not equivalent to "molecular formula".

Question 6

Questions on bonding continue to prove a minefield for many candidates, but it was pleasing to see several parts of this question well answered. In (a)(i), the drawing of dot and cross diagrams was generally done well, but few correct answers were seen in (a)(ii) – most candidates described the formation of covalent bonds instead of the electrostatic attraction between the bonding pair of electrons and the nuclei of the two atoms. The formation of ionic bonds, tested in (b)(i) was well answered, with a minority of candidates failing to score only the mark for clearly stating the number of electrons transferred. Part (c) was poorly answered – many used the term "intermolecular forces" to describe the bonding in sodium oxide, but the commonest error was to compare the ionic bonding in sodium oxide with the covalent bonding in water. Part (d) was well done, the commonest errors being the use of "aq" as the state symbol for water and the inclusion of Na^+ with, or instead of, OH^- in (d)(ii).

Question 7

Part (a)(i) was a straightforward test of recall of trends in Group 7, but few candidates scored both marks here, although astatine was usually given in (a)(ii). The equation in (b)(i) was often correct, with H and Cl instead of H_2 and Cl_2 being the commonest errors, although some equations with correct formulae were unbalanced. Carelessness in writing formulae continues to be an issue, with incorrect lower cases such as H_2So_4 and $CaCo_3$ being common examples. Candidates should be aware that such carelessness is penalised in examination papers; because of the way scripts are marked, this has to be done in a specific question part – in this paper, it was in this part, where examples such as HcL and Cl^2 in (b)(i) were penalised. Part (c) was generally well answered, with the commonest errors being the bleaching of litmus paper in (c)(i) and the belief that methylbenzene is an alkali in (c)(ii).

Question 8

Most candidates scored the mark in (a), but found the correct choice of words difficult in (b) (mass of solution, amount of solution). Some candidates continue to have difficulty reading scales (e.g. 18.65 at the start, 25.9 at the end) – it might help if they wrote some intermediate values (e.g. 16, 17, 18, 19) on the diagram on the question paper. Parts (b)(iii) and (c) were generally well answered, but in (d) many answers stated only that it was more reactive than the other metals or even that it was too unreactive.

Question 9

The first three parts in (a) were well answered, but the method of separation in (a)(iv) was less well done with some answers suggesting that the nitrogen and hydrogen were liquefied and others referring to dissolving the ammonia in water. Most attempts at the calculation in (b) resulted in the award of marks, often consequentially (usually for answers of 34 and 136 tonnes, or equivalents in grams). It was pleasing to see many good answers in (c), although a small minority of candidates confused reaction rate with equilibrium position. As in (b), the calculation in (d) resulted in many marks awarded, though not often consequentially. Most of those who started the calculation but had the wrong empirical formula had converted a ratio of 1:2:1.5 into a ratio of 1:2:2. Very few of those who obtained the correct empirical formula went on to give a correct name – nitrogen, oxygen and ammonium oxide were frequently seen.

Question 10

Although many excellent answers to (a) were seen, others were spoiled by the use of inappropriate terms – it is not correct to state that molecules of iron move, or that layers of protons slide. The observations and equation in (b) were often well done, although some correct colours in (b)(i) were not accompanied by the term precipitate (or equivalent), and several equations in (b)(ii) did not score as they included $NaSO_4$, rather than the correct Na_2SO_4, as a product.

Question 11

Most candidates realised the reason for the anomalous result in (a), with only a small minority stating only that it was anomalous. In (b), the scale used was more challenging than some previously used ones, but fortunately only a small minority misread the scale by a factor of 10 and squeezed their points into the bottom centimetre of the grid. There were several points misplotted by more than one small square, and the drawing of a smooth curve presented problems for some. Thankfully there were very few examples of points joined dot to dot. The calculation in (c) was generally very well done, with only a few examples of using 100 as the numerator and truncating the final answer to 37.5. Most candidates scored at least 1 mark in (d)(i), but in (d)(ii) incorrect language caused many to lose marks – the use of "molecules" is not acceptable for ions ("particles" is the recommended term), and the idea of frequency of collisions was often omitted.

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 xxxxxxxx January 2012

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