edexcel

Examiners' Report/ Principal Examiner Feedback

Summer 2015

Pearson Edexcel Certificate in Chemistry (KCH0) Paper 2C

Pearson Edexcel International GCSE in Chemistry (4CH0) Paper 2C

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. 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. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. 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

Summer 2015
Publications Code UG041067

Examiner's Report International GCSE Chemistry 4CH0 2C

Question 1

Parts (a), (b) and (c) were answered correctly by the vast majority of candidates. Part (d) was also answered well, although some candidates, having recognised that there were two electrons in the outer shell, then failed to relate this to the number of protons in the nucleus.

Question 2

Part (a) was answered correctly by just over 50% of the candidates. Those who failed to score often did so because they did not give an indication that the carbon dioxide was lost from the apparatus. For example, just 'gas produced' was not accepted without a reference to it escaping.

The mean mark for part (b) was less than one. Virtually every colour was seen, but rarely green and black, suggesting that most candidates had not observed the effect of heat on copper (II) carbonate.

By contrast, parts (c) and (d) were answered well. The most common mistake in (d) was to round incorrectly to 91.8, instead of to 91.9.

Question 3

Most candidates knew, in (a), that bromine is a red-brown liquid at room temperature, although some thought it is a brown gas.

The equation in (b) was balanced correctly by over 90% of the candidates. The most common mistake was to put a zero (0) in front of Br_2.

In parts (c) (i) and (c) (ii) a number of candidates had difficulty in expressing their answer precisely. Many made reference, in (c) (i) to a halide ion having the same reactivity as the halogen, and then went on, in (c) (ii), to state that the halogen added was less reactive than the halide present in solution. It is important to compare the reactivity of the two halogens, not that of the halogen and the halide ion.

By contrast, parts (c) (iii), (iv) and (v) were, in general, answered well. However, in (c) (vi), many lost the first mark for stating that iodine, not iodide ions, were the oxidising agent.

Question 4

Most scored the mark in (a) (i) for yeast, which was an acceptable answer, although zymase was the preferred answer.

Just over 50% were able to complete correctly the equation in (a) (ii). Those who failed to score mostly did so by either by writing CO_2 instead of $2CO_2$, or writing C_2O_4.

Most of those who scored the mark in (b) did so by giving 300ºC as their answer, which was in the middle of the accepted range. A common incorrect answer was 450ºC, presumably confusing this process with either the Haber process or the contact process.

Many scored both marks in part (c). The acceptable answers of decomposition and addition were seen just as often as the preferred answers of fermentation and hydration.

In part (d), the two most common correct answers were 'faster reaction' and 'pure(r) product'. Any comparison of just the economics of the two reactions was considered insufficient.

Lack of precision of language was again the downfall for a number of candidates in part (e). It is sugar cane, not sugar or glucose, which is grown. Crude oil, not ethene, is the raw material that is in finite supply.

The equation in (f) (i) was well known and just over half of the candidates were able, in (f) (ii), to classify the reaction as dehydration.

Question 5

Around two thirds of the candidates managed to score all three marks in (a). Those who lost one mark did so mainly for quoting their answers to two decimal places, a level of precision that is not warranted from the scale of the thermometer.

In part (b) (i), a few candidates used the temperature change calculated in part (a), rather than that given in the question. This lost them the first mark but they were able to score the second mark for a consequentially correct calculation.

The calculation in (b) (ii) was done well but some lost the second mark for an incorrect rounding of their final answer, e.g. 0.048 rather than 0.047, or 0.04 rather than 0.05.

Failing to convert the heat energy change from joules to kilojoules resulted in a number of candidates scoring only one mark out of the two available in (c) (i). However, an answer of 50 000 **J**/mol scored both marks.

In (c) (ii), most placed the energy level of product below that of the reactants, but labelling the enthalpy change proved to be more difficult. Some unnecessarily included the activation energy 'hump' and then often subsequently incorrectly labelled the activation energy as the enthalpy change.

Question 6

There were many correct responses to part (a), but some failed to state that the magnesium is **too** reactive or **very** reactive. Reactive on its own, together with quite reactive or fairly reactive, were considered insufficient. Parts (b) (i) and (ii) were answered correctly by the majority of candidates. Just over half recognised correctly, in (b) (iii) that the ions would now be mobile or would break away from the lattice. A description of the ions as just 'free' was considered to be insufficient; however 'free to move' was acceptable. Less than half of the candidates were able to produce a correct ionic half-equation in (b)(iv). Common mistakes included Cl^{2-}, 2Cl and the electrons on the wrong side of the equation with an incorrect sign, e.g. $2Cl^- + 2e^- \rightarrow Cl_2$.

Surprisingly few candidates managed to score all four marks for the two calculations in (c) (i) and (c) (ii). In (c) (i), most scored a mark for the correct calculation of the relative formula mass of magnesium chloride, but a significantly large number of these candidates did not appreciate how to use this value to obtain the final answer. In (c) (ii), few obtained the correct answer of 4 000, but a larger number managed to score one mark for either 2 000 or 4; both involved just one error. The most common incorrect answer was 2, which involved two errors.

In general, only the most able scored high marks in part (d). There were some careless mistakes such as using hydrochloric acid instead of sulphuric acid, or magnesium instead of magnesium oxide. Very few recognised that an excess of magnesium oxide should be used and consequently went straight to the evaporation stage without filtering. A significant number of candidates failed to score the last two marks since they evaporated the solution to dryness, which would produce anhydrous magnesium sulphate as opposed to the hydrated form.

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

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