Examiners' Report

Principal Examiner Feedback

Summer 2018

Pearson Edexcel International GCSE

In Chemistry (4CH0) Paper 2CR

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 2018
Publications Code 4CH0_2CR_1806_ER

Examiner Report International GCSE Chemistry 4CH0 2CR

<u>Question 1</u>

As expected, most candidates scored very well in this question although some found difficulty using the data to identify the gas with the highest boiling point and the two gases with the same relative formula mass.

<u>Question 2</u>

In (a)(i) most candidates realised that the mass would decrease, and the majority also linked this to the production of carbon dioxide, but some did not clearly explain that the gas had to leave the flask for the mass to decrease. In (ii) the majority correctly stated that the reaction would stop when all the acid had reacted and also in (iii) most gave a suitable suggestion either about the mass staying constant or that fizzing would stop at the end of the reaction. Most candidates in (b) recognised that the sketched curve should be steeper but fewer appreciated that the new curve should level off at the same height. In (c) most candidates stated that the rate of reaction would decrease, and many also recognised that when the concentration of the acid was decreased there were fewer particles present and so fewer collisions between particles would occur. Unfortunately, many failed to gain full marks as they did not refer to the particles being in the same volume, or relate the collisions to a time factor or frequency of occurrence.

<u>Question 3</u>

In (a)(ii) most candidates knew that a white background provided by the tile would make the colour change more visible. However, a significant minority thought that the main purpose of the tile was to protect the bench from the reactants, and a few suggested it was to stop the heat of the reaction from burning the bench. In (iii) the majority gave two correct colours for the indicator and usually in the right order. Encouragingly, far fewer than usual used *clear* as a synonym for *colourless*. Part (iv) was to test the more able candidates and and it was pleasing to see those who appreciated that the number of moles/amount of NaOH would be unaffected by water being present. Others were able to gain the mark by stating that the presence of water would not affect the volume of acid required in the titration. In (b) a large majority were able to correctly complete the table and part (c)(i) was also very well answered with most being able to select the concordant results and evaluate the average correctly. However, sometimes the rounding was incorrect. It was very pleasing to see large numbers of good titration calculations in part (d) with many candidates earning all 3 marks. Those who lost marks was usually because they either incorrectly used the the 3:1 ratio or used a 1:1 ratio.

Question 4

In part (a) candidates were often unable to select the compound which had the same empirical and molecular formula. In (b) many candidates were able to draw one correct displayed formula for the straight-chain isomers but there were often mistakes in the second attempt. Many candidates inadvertently drew the same isomer twice, thinking their second structure was different to the first. It might help if they were reminded that a straight-chain of carbon atoms means a *continuous* chain. Other common errors included the omission of one or more hydrogen atoms and showing carbon atoms with too many or too few bonds. Candidates should be advised to check that every carbon atom in any displayed formula always has exactly four bonds. Significant numbers did not carefully read the question and drew correct but uncreditworthy branched isomers. In (c)(i) many candidates gave a correct observation but some did not gain the mark as in this instance they used the term *clear* instead of *colourless* whilst others gave a colour change the wrong way around. In (ii) bromine was often given as the reagent but many either omitted the need for UV light or instead gave a variety of different conditions of temperature or pressure. In (d)(ii) a range of errors were often seen. Some drew the displayed formula of poly(ethene) instead of poly(chloroethene). Others had too many chlorine atoms or omitted either the n and/or the extension bonds. A surprising number of candidates drew structures still containing the C=C double bond. Part (e) caused problems many candidates. In (ii) they sometimes did not specify the type of polymerisation their answer was referring to. On the other hand, it was pleasing to see good candidates gaining the mark usually for stating that condensation polymerisation produces water or another small molecule.

Question 5

As expected most gave electrolysis in part (i). In part (ii) however, the majority of candidates failed to gain the mark. This was often because their answers were too vague with common examples being just *zinc reacts* or *zinc is too reactive*. A surprising number thought that zinc does not conduct electricity. In (b)(i) less than expected gave a satisfactory test for oxygen, with references to burning or unlit splints being quite common. In (ii) most candidates attempted the $2H^+ + 2e^- \rightarrow H_2$ half-equation with about half of them being correct. Common errors included an incorrect charge or no charge on the hydrogen ion or putting the electrons on the wrong side of the half-equation. Others showed hydrogen shown as monoatomic or did not balance the half equation. Strong candidates found the electrolysis calculation in (c) quite straightforward, but others made errors in using the mole ratio. It was surprising to see some candidates try methods, usually without success, involving converting faradays to coulombs. In (d) only the very best candidates appreciated that a half-equation starting with hydroxide ions is not really suitable for a solution of acid.

Question 6

In (a)(i) most knew that the temperature change of the water would need to be recorded, but significant numbers failed to mention the volume or mass of water. Some suggested that it was the mass of the alcohol used, rather than of the water, which would be needed. The calculation in (ii) proved accessible to most candidates with the majority gaining full marks. Part (b)(i) involved calculating an enthalpy change for the combustion of hydrogen. The most common error seen was multiplying the O-H bond energy by 2 instead of 4. Some candidates obtained a positive value for the enthalpy change not appreciating that combustion must be exothermic. Most candidates correctly matched the sign of their answers to (i) with the relative positions of reactants and products in (ii). However, some failed to label ΔH or drew an arrow significantly shorter than the gap between the reactant and product levels.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom