Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

November 2024

Pearson Edexcel International GCSE
In Chemistry (4CH1) Paper 2C

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Question 1

In (b) many candidates mentioned neutrons and isotopes which were irrelevant here. The question just needed to say there were the same number of protons and electrons or the same electron configuration. Quite a few just stated that there was the same number of electrons in the **outer shell** which was ignored as this did not answer the question.

In (c) many candidates ignored multiplying the three protons and four neutrons with the masses and just added the masses together. If the answer was in the standard form they often scored one mark. Many did however, knew what to do and gained both marks.

Question 2

Most candidates in (a)(i) new that the layers moved and slid over each other. Some lost a mark for not mentioning the layers. Others started saying that electrons moved or slid which lost both marks. In (a)(ii) many knew the electrons moved, but a few lost a mark for not mentioning delocalised electrons or others just said that carried charge and did not say the electrons moved. Many did score both points but some lost both marks for stating that the ions moved. In (b) was well answered with most knowing that extraction used carbon and often said iron was less reactive or carbon was more reactive. A few lost both marks for stating electrolysis was a better method. In (c) those that knew sodium hydroxide was added often gained both marks. A few lost the second mark by not mentioning the precipitate or gave the wrong colour. Many lost both marks as they did not know a correct reagent.

Question 3

The majority in (b) knew that X was the thermometer and Z was the beaker, but a few said the flask instead. The condenser was less well known but many did still score all three marks. In (c) was not well done. The candidate had to measure the boiling point to gain the first mark and has a fixed boiling point. A few knew the boiling point of ethanol was 78^{o}C but many had the wrong boiling point and 100^{o}C was seen confusing it with water.

Question 4

Well answered on the whole for (a)(i). A few lost a mark for saying there was a flame or melts into a ball which was not correct. The most common answer was fizzing or the lithium moves on the surface. A few just stated hydrogen was formed which was not credited as it was not an observation. Most knew that in (a)(ii) the colour was blue or purple and stated that it was an alkali for both marks. A few thought it was red and acidic so lost both marks.

Many fully correct answers were seen in (b). Some lost the first marking point but sometimes gained one or two marks for error carried forward, by multiplying by 2 and 7.

The most common answer was mentioning the flame in (c)(i). If they said it moves faster was enough to gain the mark, but just saying it fizzes quickly was not enough as it must be a comparison to gain the mark. This question in (c)(ii) discriminated well. There were some good clear answers which gained all three marks. However,

a mark was often lost by mentioning electron**s** or another mark was often lost as the **outer** shell was not mentioned. Some just stated that potassium was more reactive, which was not creditworthy. Most did gain the first mark for saying there were more shells in potassium or that the outer electron was further away from the nucleus.

Question 5

This question (a)(ii) was poorly done. Many candidates just gave one colour which was not creditworthy. It had to be a colour **change** from yellow to red or yellow to orange. In (a)(iii)

many candidates were too vague. Some said there was a sharp colour but did not say they was a sharp colour **change** so failed to score**.** Others said there was no clear end point or there was a wide range of colours, which was enough for the mark. In (b)(i) a common error was to give a value of 23.8 and was stated that the value needed to be 23.80 to score so many candidates lost the first mark. Very few candidates achieved all three marks in (b)(ii) although many scored two marks. One error was using the right values but lost a mark for giving 21.4 instead of 21.40. Many did not understand concordance and some used three, four or five values to find the average of the values. However, many did score two marks for finding the average correctly. Some lost a mark for giving answers to three decimal places or rounded them incorrectly. This question in (c) discriminated very well giving a full range of marks. The first marking point was often missed as there was no indication of referring to the volumes or reacting without indicator. Many gained the second marking point for heating and partially evaporating the solution. A few however did not cool the crystals or sometimes forgot to filter the crystals. Many candidates dried the crystals correctly. Very few mentioned to heat to dryness, which was pleasing to know.

Question 6

This question in (a) discriminated well giving the whole range of marks. Most candidates heated the crude oil and scored the first marking point. Many also stated that the column was hot at the bottom and cool at the top for the third marking point and some said they condensed at their boiling point for the fourth mark. Only a few scored the second mark as they did not say that the vapours rise up the column. Around half the candidates in (b)(i) knew the correct conditions and scored both marks. Some answers were too vague and did not score as just stating high temperatures and a catalyst is not enough to score any marks. Many knew the name of the catalyst and silica was the most popular answer. This question in (b)(iii) was well answered with the majority gaining all three marks. This was a show that question with an answer of approximately -100 kJ/mol. Answers were often a long way from

-100 kJ/mol and candidates need to realise that they have obviously made a mistake so they need to go back and check their working again. Question (b)(iv) was very poorly answered with only around a fifth of the marks scored both marks. Many just said that was exothermic as there was more energy released and nothing about breaking or forming bonds, which was not creditworthy. Many said energy was

needed to make the bonds which was incorrect and therefore lost both marks. It was evident that was not understood by the majority of candidates.

Question 7

Most candidates in (a)(i) knew that propanol was the correct answer. Butanol was sometimes mentioned instead of propanol. Most also displayed the structure correctly in (a)(ii) but quite a few lost the mark by not showing the bond between O and H, as this was not fully displayed. Those who knew what to do in (a)(iii) generally scored all three marks, but around half of the candidates had no idea and scored zero with only a very few scoring one or two marks. A fair number of candidates scored all four marks in (b)(i) and many had no clue and around a third scored zero. Others that scored some marks either forgot to divide by two and lost the second marking point or lost the fourth marking point by not understanding how to give the answer to three significant figures. In (b)(ii) was poorly answered with the majority scoring zero marks. Some knew the ester linkage and scored one mark but the rest of the molecule was often not correct. Only the best candidates scored both marks.

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