Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

November 2021

Pearson Edexcel GCSE Combined Science
(1SC0) Paper 2CH

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November 2021
Publications Code xxxxxxxx*

This examination session was a supplementary one for those candidates who could not be awarded a grade in Summer 2021 or who wished to improve on the grade they were awarded at that time.
For this paper, the entry was extremely small, and it should be borne in mind that comments made reflect what was seen and does not represent what would be normally seen at a complete cohort level.

Question 1(a)

A few candidates managed to get the correct answer, but it was more common to see the calculation done without the unit conversion and so some candidates lost one mark here. Some candidates did not convert the volume to dm^3 and then rounded the answer to 1 significant figure and scored no marks.

Question 1(b)(i)

More half of the candidates scored both marks for this question. However, there seemed to be a common misconception here that endothermic reactions do not have any energy change at all. Candidates often stated that no heat energy was given out but not that heat energy was taken in. Some candidates also discussed the idea of bond making and breaking but this was not asked about in the question.

Question 1(b)(ii)

It was apparent here that many candidates did not know how to identify the activation energy on the graph as very few scored this mark. Many indicated the top of the curve and labelled this as the activation energy. Some candidates could draw the correct curve but it was common to see curves not linking to the product and reactant lines, and there were even some upside down curves drawn.

Question 1(c)

The majority of candidates scored one mark for this question – for correctly identifying that the solid did not conduct electricity while the solution did. Fewer candidates were able to explain this in terms of the movement of ions – most discussed the movement of electrons and therefore could not score the second or third marking points. A small number of candidates discussed their answer in terms of molecules which also could not score the final marking points.

Question 2(a)

The vast majority of candidates got the correct response for this question.

Question 2(c)

More than half the responses got the correct formula for nitrogen dioxide, and most of these also got the correct number in front of the formula. However, a minority of candidates gave the formula of nitrogen dioxide either as N_2O or N_2O_2. Some candidates also tried to include carbon dioxide as a product alongside the nitrogen oxides.

Question 2(d)

Most of the candidates correctly identified carbon dioxide and / or water as a greenhouse gas produced when complete combustion occurs. Many then identified nitrogen dioxide as a product of combustion or a greenhouse gas. Only a very few candidates scored any

further marks as the answers were too general overall and stated that greenhouse gases were responsible for temperature rises rather than explaining how this happens.

Question 3(b)

Far more candidates were able to explain potassium's position in group 1 of the periodic table compared to the period. A few candidates discussed the electron configuration or reactivity of potassium and mentioned nothing about the position in the periodic table.

Question 3(c)(i)

A lot of candidates lost both marks here by not stating that the splint used to test for oxygen needed to be glowing. The terms 'burnt' and 'lit' were frequently seen. Some candidates identified the wrong gas test and gave the test for chlorine or hydrogen.

Question 3(d)

There were a lot of blank responses submitted for this question, and where candidates had attempted to answer the responses were usually low scoring. Marks were usually awarded where a candidate stated that the apparatus should be heated or that the volume of air in the syringes should be measured at the end of the experiment. There were very few responses that put together a workable method that would achieve a result.

Question 4(b)

It was sometimes difficult to see what the candidates had drawn, so the use of labels here was helpful. Most candidates drew either a gas syringe or a delivery tube and bung but rarely both. Occasionally candidates drew a potometer instead of a gas syringe and often they drew the delivery tube without a bung, or other equipment that just wouldn't work.

Question 4(c)(i)

A lot of correct responses were seen here, although there were two common mistakes. Candidates often wrote to use a thermometer to control the temperature, or suggested the use of a Bunsen Burner to get the mixture to 45°C.

Question 4(c)(ii)

This question was very poorly answered, and most candidates did not correctly draw any sort of tangent onto the curve. Many candidates simply read the volume of gas produced at 100 seconds and divided the two numbers. Other incorrect attempts at drawing a tangent included drawing a triangle underneath the curve.

Question 4(c)(iii)

The most common correct answer here was to use a constant volume of acid but there were a variety of correct responses. Some candidates stated that the temperature should be kept constant, in spite of this being given in the question. A few candidates gave very generic answers such as keeping the equipment in the same place or timing the reaction.

Question 4(c)(iv)

Most candidates correctly stated in some way that the rate of reaction would decrease, although a number of candidates repeated the question in stating that the rate of reaction

would be affected. Fewer candidates could explain why the rate of reaction decreased and tended to either mention the success of collisions or the energy available but rarely both.

A small number of candidates stated that the reactants would become solid at low temperature, which did not answer the question being asked.

Question 5(b)

There were surprisingly few candidates that scored any marks on this question. There was a mark available for calculating the relative formula mass of phosphorus oxychloride – however a significant number of candidates either simply calculated POCl or multiplied the masses together rather than adding them. Of the candidates that correctly calculated the relative formula mass about half went on to correctly calculate the percentage by mass of chlorine.

Question 5(c)

There were a lot of blank responses for this question, and only a few candidates scored full marks. A few candidates gave a clear, well presented answer that was easy to mark but many were difficult to work through and understand due to how they were presented, and it was hard to award marks in these cases.

Question 5(d)

Candidates knew more about the reactivity of Group 1 metals compared to Group 7 elements. In many cases, the reactivity increase down Group 1 was well explained in terms of losing the outer electron. However, whilst some candidates correctly stated that Group 7 were more reactive up the group, very few explained why this was the case.

One of the most common misconceptions here were that the reactivity of Group 7 also increases down the group, which led to the incorrect answer as to which would be the most violent reaction.

Some candidates concluded that the reaction with rubidium would be the most violent but were only awarded marks if they justified why they had decided this.

Question 6(a)(i)

It was clear that the candidates did not understand what was being asked of them in this question. Very few responses scored any marks at all. Candidates gave answers that referred to carbon monoxide being damaging to the environment, a cause of acid rain or discussed the fact that the fuel was a hydrocarbon. Some responses simply stated what was given in the question – that incomplete combustion produces carbon monoxide – and gave no explanation at all.

Question 6(a)(ii)

In general, the responses to this question lacked enough detail to be awarded any marks. Many candidates stated that carbon monoxide is a colourless gas that can kill, rather than answering the question that was asked. There was also a common misconception that carbon monoxide causes lung damage or is damaging to the environment.

Question 6(c)

Most candidates had a good attempt at this question and many scored at least 2 marks. The most common errors were that candidates either subtracted reactants from products (rather than products from reactants) or neglected to add the minus sign to the answer having done the correct calculation. There were a number of errors made in obtaining the total bond energies. The most common of these errors was the omission of the C-C bonds when calculating the bond energy of the product molecule.

Question 6(d)

This question was poorly answered, and it was apparent that candidates did not understand the process that was shown in the question. A significant number of responses stated that droplets of water formed during evaporation, and most suggested that the water droplets formed from water that was originally in the beaker.

General Comments

Candidates should ensure that they have a calculator for the exam in order to be able to access full marks for some of the calculation questions.

Some candidates lost marks in calculations either by rounding too early or by giving their answer to only 1 significant figure. The answer to a calculation question should be given to the same number of significant figures used in the question, unless a specific number of significant figures or decimal places is asked for.

Candidates should check through and make sure that they are answering what is asked, rather than just giving general knowledge about a topic.

Drawing and labelling equipment remains a weak area for many candidates.

Candidates tend to score fewer marks on questions relating to practical work.