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Examiners' Report

Principal Examiner Feedback

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

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Question 1

As expected this was usually very well answered. Possibly those candidates who did less well, had not had the same level of practical experience in a laboratory as others.

Question 2

(a)(i) Many candidates gave correct answers, but some just identified same atomic number without being more specific, and so failed to gain credit. Others incorrectly referred to electrons, probably carelessly, as it was often tied in with a correct answer in terms of protons. In (a)(ii) the majority of responses were correct although some responses just mentioned different mass number, which although not incorrect, was not sufficient to gain the mark.

In (b) the calculation of relative atomic mass was often well done. The most frequent reasons for not gaining full credit amongst those who clearly knew what to do, were not reading the question carefully and giving the answer to 2 or 3 decimal places, or, incorrect rounding of 85.556

Question 3

In (a)(i) most candidates gave a fully correct answer of thermal decomposition and the majority of others gained the mark for just stating decomposition. Some common incorrect responses included combustion, neutralisation and references to redox. Part (a)(ii) was generally well answered although some candidates wanted to add HCl as well as limewater. A few incorrectly thought extinguishing a lighted splint was an acceptable test for carbon dioxide.

In (b)(i) many just effectively repeated the question, or suggested that the solid dissolved or melted and therefore lost mass. It was not uncommon to see candidates thinking that the mass loss was caused by heat energy being lost or given off. In (b)(ii) many of the incorrect responses suggested that there was no oxygen left for reaction or that all the solid had been burnt.

Question 4

In (a) most gave correct answers with only a few describing endothermic reactions. Some unfortunately used the term energy without mentioning heat. It was good to see many candidates giving excellent answers in (d).

However, it was disappointing to see quite a lot of candidates, who otherwise seemed to have a decent understanding of what was involved, then weakening their response by a lack of accurate use of terminology. In particular, the use of intermolecular forces was very common, and despite clear information in the question about ions, covalent bonding was often referenced. Some very good answers were seen when the candidate considered which particular point they were trying to make, and then used bullet points in their answers.

Question 5

As expected, part (a) was answered very well overall, with just the occasional careless mistake in readings or calculations of the temperature decrease. The straightforward data values needed to plat the graph gave most candidates the opportunity to score maximum marks on this question. Some occasionally lost marks by failing to use a ruler or not making their lines go through all the points. Some candidates read the value off their graph incorrectly in (b)(ii), giving answers such as 0.25, 0.7 or 0.8 instead of 0.75

Question 6

Part (a) was usually answered well with many candidates being able to score at least the first mark for giving the correct repeat unit. However, it was quite common to then see the n in the wrong place or sometimes a failure to include brackets. Part (b) was less well answered although there were many correct references to only one type of monomer being involved or no loss of molecules occurring. However, some unfortunately did not seem to understand the question and described the formation of addition polymers, or gave uses and properties of polythene.

Part (c)(i) was generally not well answered. Candidates often seemed not to appreciate what is meant by a property, and then, of those that did, many then did not follow the instruction in the question, and so did not link their property to a use. This was disappointing, as in the question they had been given an example. Many candidates again failed to achieve both marks in part (c)(ii) but it was answered to a higher standard than the (c)(i). However, there were very many vague or generic answers that did not relate directly to the question.

Question 7

Many good complete answers were seen in (a) but also candidates unfortunately often scored only one mark because they failed to mention that ions do not move/flow when solid. It would perhaps be helpful to remind candidates to look at the mark allocation when considering the detail required in their answers. The most common misconception was given by those who discussed electrons not moving in the solid state but then moving when molten. Providing a correct ionic half-equation in part (b) proved to be difficult for very many candidates. A wide range of incorrect answers were seen with common examples being $Mg^{2+} + 2e^- \rightarrow 2Mg$ and $Mg^+ + e^- \rightarrow Mg$

In (c) answers were often disappointing. Although many candidates stated that the steel would react, but they then did not say what it would react with, or gave a wrong suggestion such as magnesium or hydrogen. Many thought that steel could not be used because it is an alloy whilst others thought that steel does not conduct electricity.

Question 8

This was answered well by many candidates who were able to gain all four marks. In (a)(i) 20 mol was a common partially correct answer which scored one mark. In (a)(ii) candidates again often frequently lost a mark for not converting the final answer to kg by dividing by 1000. In (b) the most commonly obtained answer by candidates was for the awareness that the production of oxygen would be useful and many also realised that more carbon dioxide was absorbed by the peroxide. Incorrect answers often contained a reference to the production of water.

Question 9

In (a)(i) many candidates scored both marks with the majority appreciating the symbol for a reversible reaction, but fewer correctly gave the enthalpy change. Common errors including included temperature change and energy change with no reference to heat. Part (a)(ii) was answered well overall, but common incorrect answers included aluminium oxide, vanadium pentoxide and iron.

It was pleasing to see (b)(i) being answered succinctly and correctly by many candidates who understood the concept of equilibrium reactions. As usual, despite previous advice, many candidates gave answers linked to Le Chatelier's principle without providing the reason for the shift in equilibrium position by not stating that the (forward) reaction is exothermic. Some candidates failed to gain credit as they

did not predict the effect on the yield, whilst some others just discussed rate of reaction. Part (b)(ii) often proved to be a bigger challenge with many failing to appreciate the numbers of moles involved on each side of the equation is crucial to answering the question. No change in yield was a frequently seen incorrect response.

In (c)(ii), whilst many candidates had the correct idea of crude oil being a finite resource, many others gave unacceptable references to cost or ease/rate of reaction. Some unfortunately thought that crude oil is an infinite resource.

Question 10

In (a)(i), most candidates gave the correct answer of lanthanum, but the explanation was sometimes poor. Many simply stated that it has the lowest melting point, or that the melting point is 920°C, but then did not link it with the given operating temperature of the reaction. As expected, the difficult equation in (a)(ii) proved a significant challenge for all but the best candidates.

In (b), two or three marks were frequently awarded. The two most common marks awarded were for explaining the conductivity, although some candidates lost these marks for incorrectly describing the movement of ions instead of delocalised electrons. In explaining the malleability some candidates failed to mention that the ions (or equivalent term) are in layers as shown in the diagram in the question.

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