

Examiners' Report/  
Principal Examiner Feedback

Summer 2014

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

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Chemistry – 4CHO 2CR**

**Question 1**

This question about atomic structure posed few problems, with most candidates scoring full, or nearly full, marks. However some candidates did not read the question in (d)(i) carefully and produced answers that did not include a reference to sub-atomic particles. The expected answer to (e)(i) was 'unreactive', but 'does not react', although technically incorrect, was not penalised. References to 'full outer shell' and 'contains eight electrons in the outer shell' were allowed but, as a better preparation for further studies in Chemistry, the examiners would like to encourage teachers to adopt the phrase 'do not easily gain or lose electrons' as an explanation for the lack of reactivity of the noble gases.

**Question 2**

A surprisingly high number of candidates made reference to keeping the concentration of the acid constant in (a)(i) despite the instruction in the question to consider only the metals. Since several metals were used in the investigation it is not correct to state that the mass should be kept constant, but this was allowed on this occasion as an alternative to the correct answer of amount. Size of metal was not an acceptable alternative to particle size or total surface area. The rest of the question proved straightforward for the majority of the candidates.

**Question 3**

Part (b) was not well answered with many candidates merely repeating the information given in the question by using the word 'displaces'. The examiners were looking for a word or phrase that indicated what is meant by displacement in this context. The two most common correct answers were that aluminium replaces iron, or takes the place of iron. Only a third of the candidates were able to produce a correct answer to (d). The rest did not recognise that it was the burning of the magnesium in oxygen that was generating the heat.

#### **Question 4**

Parts (a) and (b) were generally well answered. Candidates should take note that when a displayed formula is asked for **all** the bonds must be shown. Some lost a mark in (b)(i) for not displaying the bond between oxygen and hydrogen. It was very pleasing to see that the vast majority of candidates were able to apply their knowledge of nomenclature to suggest a sensible name for compound D. Most wrote propanol, which was the expected answer, but some even gave the perfect answer of propan-2-ol. Only half of the candidates scored both marks in (c), with some quoting catalysts and conditions from other industrial processes included in the specification.

In (d)(i), the majority of candidates failed to recognise that ethene requires more oxygen than acetylene for complete combustion. A number of candidates lost one or two marks in (d)(ii) by not stating that carbon monoxide was poisonous, or its equivalent, and/or by not explaining correctly why it is poisonous. The following statement taken directly from the specification is the best way to answer the latter: 'Carbon monoxide reduces the capacity of the blood to carry oxygen'. There is no need to make any reference to haemoglobin, although correct references to haemoglobin were accepted.

Most were able to select one of a number of acceptable answers to (e)(i) with the risk of explosion being the most common answer. The equation in (e)(ii) was answered correctly by nearly two thirds of the candidates.  $C_2H_6O$  was not allowed for ethanol as this formula is ambiguous.

#### **Question 5**

In (a)(i), very few answers referred to a lack of precipitate forming when the reaction was complete. A very common incorrect answer was to state that there would no longer be any bubbling or effervescence or gas given off. Only a quarter of the candidates were able to satisfactorily explain why, in (a)(iii), steps 4 and 5 should not be included in the preparation. Most of those who successfully answered this question focused on the fact that the required product had already been obtained in step 3. A significant number of candidates lost marks in (a)(iv) by referring to the filtrate instead of the residue. Most were able to deduce the required amounts of reactants in (b)(i) and to go on calculate the volume of lead (II) nitrate solution required in (b)(ii). Only occasionally were the units missing.

### **Question 6**

Very few mistakes were made in reading the thermometers or in calculating the temperature change. Although this was not penalised, candidates should be aware that a change in temperature should have a sign – in this case positive since an increase in temperature was observed. The most common acceptable answers to the calculation in (b)(i) were 0.0604 and 0.06. Some candidates who gave 0.06 as their answer to (b)(i) carried over their calculator value to obtain an answer of 483. Others used 0.06 to obtain 487. Both sets of answers were given full credit. Nearly two thirds were able to obtain full marks for the bond energy calculations in (c), although some failed to obtain the last mark by not including the negative sign.

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