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ASSESSMENT and QUALIFICATIONS ALLIANCE

## General Certificate of Secondary Education

# Science B 4462 / Chemistry 4421

## CHY1H Unit Chemistry 1

# Report on the Examination

*2008 Examination – January Series*

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# Science B / Chemistry
# Higher Tier CHY1H

### General

There were six questions on this paper. The first two questions were targeted at grades C and D and were common to both Foundation and Higher Tier. The last four questions were targeted at grades A and B. The majority of candidates appeared to have sufficient time to complete their paper. Candidates should be reminded to write their answers clearly in black ink or ball-point pen and within the space provided. Note that when candidates give several answers when only one or two are required, they might not be credited for their correct ideas if errors or contradictions are included in their response.

Fundamental knowledge and understanding of How Science Works in the world at large, as well as in the laboratory, were tested throughout this paper. This means that candidates need to be reminded that it is essential to first read all of the question carefully, analyse the information provided and think about their response before writing their answer.

However, there was evidence that candidates had used past papers as part of their revision, as some questions produced far better responses this time than their equivalents in previous papers.

There is still the problem of correct but incomplete answers where questions carry more than one mark. Candidates often concentrate on one factor, repeating it in different forms three times, rather than giving three different factors in a three mark response.

Increasingly, we are seeing generic answers, where a candidate may have a prepared answer on the reasons for recycling, for example, rather than answering the specific issues raised in the context of the question. Such responses will rarely achieve full marks.

### Question 1 *(Standard Demand)*

In part (a) the majority of candidates read the information supplied and correctly based their answers on it. Most candidates know Wegener's evidence for continental drift. However, in part (a)(ii), too many used the generic answers referring to lack of evidence, proof or reputation, rather than concentrating on this specific context.

Part (b) was generally well answered, although some candidates confused the core and the mantle.

### Question 2 *(Standard Demand)*

In part (a) most candidates gained high marks. A significant minority thought that carbonate, or CO, was a separate element.

In part (b) calcium was sometimes given as a product of heating calcium carbonate and quicklime was given as the chemical name for calcium oxide. Most knew that this was an example of thermal decomposition, but there was a scattering of every conceivable reaction type.

In part (c) there were few correct answers. Candidates ignored the information given in the stem and preserving resources was the most common answer. Too many candidates concentrated on the high melting point of glass, assuming that the glass did not need melting in order to be recycled. A large number clearly did not understand the difference between recycling and reusing glass. Few realised that the key issue was the even higher temperature, given earlier in the question, which was needed to make the raw materials react to form glass.

**Question 3 *(High Demand)***

In part (a) although many candidates did realise that unsaturated means that the molecule has a double bond, there were a lot of answers that referred to the health benefits of unsaturated oils. Most candidates did know the result of testing an unsaturated fat with bromine/iodine solution. However, sometimes the colour change was reversed, or the insufficient answer it goes clear was given.

In part (b) again the health effects of salt were described rather than the fact that there is a lot of salt in each portion of smoked salmon; over a quarter of the recommended daily allowance in fact. The Guideline Daily Amounts came from a genuine label, unfortunately this was misleading for some candidates. This meant that these candidates thought that 1.6g was the recommended daily allowance, so this answer was given credit. Candidates should be aware that, when figures are given on the higher paper, a quantitative answer will usually be required to gain full marks.

Part (c) produced a mixed response, probably because this was the first time that the question had been asked in this way. There were some excellent descriptions of chromatography, but many were very confused. Only the better candidates achieved three marks. (A common misspelling of additive was addictive). Some weaker candidates described the use of pH paper, whilst others stated that they would compare the chromatogram from the salmon with that of the unapproved additives.

**Question 4 *(High Demand)***

In part (a) most candidates were able to use the flow chart to suggest the benefits of recycling aluminium.

Part (b) produced good answers although many candidates provided no explanation and therefore only scored one mark.

**Question 5 *(High Demand)***

Most responses were correct in part (a)(i), however, candidates were less sure of the environmental effect caused by particulates. As usual there was a sprinkling of every environmental issue conceivable.

In part (b) many candidates ignored the two factors mentioned in the question, that biodiesel is both sustainable and a low polluter. Many candidates also concentrated on the bar chart rather than their own knowledge, often limiting themselves to one of the marking points, although they often repeated it three times. Part (b)(ii) was well answered by only the better candidates. The fact that fossil diesel's carbon dioxide was locked away millions of years ago was usually not mentioned at all in most explanations. A common misconception appears to be that biodiesel releases less carbon dioxide than fossil diesel during the actual burning process.

**Question 6 *(High Demand)***

In part (a) descriptions of separating naphtha by fractional distillation were often poor because of the common misconception that the fractions are separated as they evaporate, rather than as they condense.

In part (b) most candidates can balance equations, a lot cannot. Cracking is well understood, although a significant number concentrated on what happens to the molecules rather than how the process is carried out. A number of candidates appeared to be describing fractional distillation rather than cracking. Most understood the difference between alkanes and alkenes, although some candidates only mentioned the difference in chain length.

In part (c) most candidates gave the correct structure of ethene.

In part (d) few candidates structured their answers in this part. Many did not base their arguments on the 'chosen' recycling option. It was often impossible to tell what the candidates were arguing in favour of and against. A number just gave the benefits of recycling, with no counterarguments. This part was marked as a whole, crediting the marking points wherever they were given in a candidates answer. Although most candidates scored some marks on this question, few scored full marks.

**Mark Ranges and Award of Grades**

Grade boundaries and cumulative percentage grades are available on the **Results Statistics** page of the AQA Website.