



General Certificate of Secondary Education

Chemistry 4421

CHY3F Unit Chemistry 3

Report on the Examination

2012 examination – June series

Further copies of this Report are available to download from the AQA Website: www.aqa.org.uk

Copyright © 2012 AQA and its licensors. All rights reserved.

COPYRIGHT

AQA retains the copyright on all its publications. However, registered schools / colleges for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to schools / colleges to photocopy any material that is acknowledged to a third party even for internal use within the school / college.

Set and published by the Assessment and Qualifications Alliance.

Chemistry
Foundation Tier CHY3F**General**

The standard of responses was a lot higher than last year in all respects. The vast majority of scripts were also concise and very legible.

The mark scheme was flexible enough to allow students to express their answers in a variety of ways and still gain marks.

However, the following questions proved particularly difficult for nearly half of the students:

Question 4a(i) – the ion formed when an acid dissolves in water; Question 6b(ii) – why the student did not do the experiment at 100^oC; Question 7(a) – two properties of lithium, sodium and potassium which support the idea that they should be grouped together; Question 7(b) – why Newlands' periodic table was not accepted by most chemists in 1866.

Many of the questions that were less well answered tended to be those that involved recalling specific knowledge, and those that required explanation and the use of specific scientific terms. Students do need to make the effort to learn the factual material given in the Specification.

Questions 6 and 7 were standard demand questions and were common with Questions 1 and 2 on the Chemistry Higher Tier Paper (CHY3H).

Question 1 (Low Demand)

Both parts of this question were very well answered by the vast majority of students.

Question 2 (Low Demand)

This question was also quite well attempted by the majority of the students. In part (c), some students lost the mark as the answer given was very vague e.g. 'bacteria are bad for health'.

Question 3 (Low Demand)

- (a) (i) Some candidates worked out the average of the temperature rises for the other makes of crisps instead of subtracting the starting temperature from the final temperature.
- (a) (ii) The majority of the candidates scored 2 marks, although a significant minority could not give the correct reason. Many wrote 'because it was the highest final temperature' or repeated the question by writing 'it produces the highest amount of energy'. Others just wrote that 'it gives off the most heat'.
- (b) (i) A minority of the candidates scored no marks here. Some divided 240 by 4.2 while others tried to use '9000' in their calculation.
- (b) (ii) The majority of the candidates knew that crisps had high energy content but the reason given was either very vague or not given at all.

Question 4 (Low Demand)

- (a) (i) Nearly half the students scored no mark here because many of them thought that the acid forms 'hydroxide ions' when it dissolves in water.
- (a) (ii) Quite a few students thought that the ethanoic acid is 'completely ionised'.

-
- (b) (i) Was quite well attempted by the large majority of students.
 - (b) (ii) Was quite well attempted by the large majority of students.
 - (b) (iii) Nearly half of the students did not score this mark as they gave the wrong colour or said that the 'solution turned clear'.
 - (c) Around a third of the students did not score this mark. Many worked out an average of the values for the final reading.
 - (d) The majority gained two marks but about a quarter of the candidates struggled with this calculation. Some divided 1000 by 25 and got the answer as 4 while others did not multiply by 1.25.

Question 5 (Standard Demand)

- (a) (i) The majority of the candidates scored 2 marks.
- (a) (ii) The majority scored the mark, although many of the other candidates thought that calcium ions give a 'lilac' colour.
- (b) (i) The majority gained the mark but a large number of candidates thought that the answer was 'much larger'.
- (b) (ii) The most common incorrect response was that more accurate means 'the measurement is given to more decimal places'.

Question 6 (Standard Demand)

- (a) Only a very small number of the candidates scored 3 marks. The majority scored 1 mark for writing that it is the 'magnesium or calcium that makes the water hard'. They did not gain a second mark as there was no idea of a reaction between sodium carbonate and magnesium sulfate. The vast majority of the candidates did not mention 'solid' or 'insoluble' or 'precipitate'.
- (b) (i) This was quite well attempted and most students knew that it was an anomalous result.
- (b) (ii) Only about a third of the candidates managed to gain this mark. A large number of candidates wrote that the 'water will evaporate'. Others wrote that 'a pattern had already been established' while some wrote that 'people don't take a bath at 100 °C'.
- (b) (iii) A significant minority of candidates could not read the scales on the graph and gave the answer '64' or '74'.
- (b) (iv) Only a minority of the candidates scored both marks. The majority gained 1 mark for saying that the 'solubility goes up and then down'. Many candidates made vague statements e.g. 'the graph changes shape' and so gained no mark.

Question 7 (Standard Demand)

On the whole, this question was quite poorly answered.

- (a)** Only a small number of the candidates gained both marks. About a third gained one mark and often this was for the idea of 'reactivity'. Many candidates answered in terms of physical properties rather than chemical properties or in terms of electronic structure e.g. 'they all have 1 electron in the outer shell'.
- (b)** Only a very small number of the candidates gained all 3 marks. Half of the candidates scored nothing. The vast majority of the candidates wrote that 'he worked in a sugar factory' or 'he didn't leave spaces for undiscovered elements'.
- (c)** Only a small number of the candidates gained 2 marks while around half gained 1 mark which was often for saying that 'he left spaces for undiscovered elements'. Many of the candidates wrote that 'he arranged them in order of atomic number' or they made references to 'electronic structure'.

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA website

UMS conversion calculator www.aqa.org.uk/umsconversion