



General Certificate of Secondary Education

Chemistry 4421

CHY3F Unit Chemistry 3

Report on the Examination

2011 examination – January series

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Chemistry
Foundation Tier CHY3F**General**

This report should be read in conjunction with the published Mark Scheme.

The standard of responses was generally higher than last year. The vast majority of scripts were also concise and legible.

The following questions proved particularly difficult for over half of candidates: Question 2d(i) – the reagent used for testing sulfate ions; Question 3b(i) – one way of making the test fair when showing that ethanoic acid is a weaker acid than hydrochloric acid; Question 4b(ii) – why knowing about the energy in food can help towards a healthier lifestyle.

Other questions that were poorly answered by at least half of the candidates were: Question 3a(i) – the ion which shows why ethanoic acid is ‘acidic’; Question 3b(ii) – the results of the test to show how magnesium can be used to show that ethanoic acid is a weaker acid than hydrochloric acid.

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. Candidates do need to make the effort to learn the factual material given in the Specification. Questions 5, 6 and 7 were standard demand questions and were common with Questions 1, 2 and 3 on the Chemistry unit 3 Higher Tier Paper (CHY3H)

Question 1 (Low Demand)

This question was quite well answered.

- a) (iii) Almost half of the candidates were unable to correctly identify an alkali metal
- a) (v) Many candidates did not score a mark here as they could not correctly identify an element with seven electrons in its outer shell

Parts (b) and (c) were quite well answered

Question 2 (Low Demand)

- a) Just under a half of the candidates did not gain this mark. Quite a few wrote ‘one is alkali and the other an acid’ while a few wrote ‘so they don’t mix’.
- b) (i) This part was quite well attempted. A few candidates gave the answer as ‘smoke’ while others confused it with the test for carbon dioxide and gave the answer as ‘solution goes cloudy / milky’.
- (b) (ii) and (b) (iii) Most of the candidates were able to gain marks here.
- c) Quite a lot of candidates could not correctly identify the colour of the flame given by sodium ions.
- d) (i) A majority of candidates scored no marks here. Many of them gave the answer ‘sodium hydroxide’ instead of ‘barium chloride’.
- d) (ii) Most of the candidates were able to identify ‘white’ precipitate as a positive test for sulfate ions.

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- d) (iii) This part was quite well attempted although a few candidates wrote 'it would be more expensive' which did not gain credit.

Question 3 (Low Demand)

- a) (i) Nearly half of the candidates lost this mark. A large number identified 'hydroxide' ions as the reason for ethanoic acid to be 'acidic'.
- a) (ii) The majority of candidates could correctly identify why ethanoic acid is a weak acid.
- b) (i) A very large number of candidates wrote 'use the same amount/volume of acid' or 'repeat the test'.
- b) (ii) Only a small number of candidates gained both marks. Many candidates just made the statement 'hydrochloric acid is strong and ethanoic acid is weak'. A significant number of candidates wrote in terms of colour changes, pH and magnesium burning while others simply wrote 'there would be less of a reaction with ethanoic acid'.
- c) (c) (i) and (c) (ii) A large number of candidates were able to score marks here.
- c) (iii) The majority of candidates gained this mark. Some candidates wrote 'from the reading on the burette'. Other answers that did not gain credit included 'there will be no fizzing' and 'the reaction will stop'.

Question 4 (Low Demand)

- a) (i) Most of the candidates scored one mark here for 'non smoky' flame but many did not gain the second mark as they wrote in terms of 'biggest temperature increase'.
- a) (ii) This part was quite well answered. Some candidates used a temperature rise of 4°C and got the answer 1680 while others used a temperature rise of 1°C and got the answer as 420 which did not gain the mark.
- b) (i) This was very well answered.
- b) (ii) Only about one quarter of the candidates gained this mark. Many wrote 'so they know how much exercise to do to burn off the excess calories' while others gave vague answers such as 'helps you to have the right amount of calories'.

Question 5 (Low Demand)

- a) (i) Almost half of the candidates did not draw a smooth curve. Many joined the points with straight lines or drew multiple lines. There were some curves that did not touch the points at all.
- a) (ii) This part was quite well attempted and the vast majority of the candidates scored a mark.
- a) (iii) Many candidates were able to score a mark for '35.8' but they were unable to process the data to get the second mark. Some added the two numbers together

while quite a few candidates misread the scale and got '35.6' instead of '35.8'. Others subtracted 20° from 60°.

- b) Almost half of the candidates were unable to explain their answer correctly. They wrote in terms of 'different units/numbers', 'inaccurate scale', 'used different graphs', 'smaller/bigger measurements' or 'used different amounts of sodium chloride'. Some wrote that the graph was less/more precise instead of the scale being less/more precise.

Question 6 (Standard Demand)

- a) Very few candidates gained two marks. Many did not gain the mark for 'filtration' as they did not mention 'insoluble' or 'solid'. Quite a few candidates wrote in terms of removal of ions such as calcium and magnesium. Some candidates did not gain the mark for treatment with chlorine as they wrote 'it gets rid of/removes bacteria' instead of 'kills bacteria'.
- b) (i) A lot of candidates did not gain a mark here for the 'disadvantage'. Many said that the portable method was less accurate while others thought that the instruments help to remove the arsenic, so gave answers such as 'the portable method removes less arsenic'.
- b) (ii) About one third of candidates did not gain this mark because they answered in terms of 'PIWE being experts/more knowledgeable/scientific/professional or skilled' rather than in terms of bias.

Question 7 (Standard Demand)

- a) Almost half of the candidates scored no marks here. A large number wrote about the rocket taking off, landing or accelerating. B was often given as 'energy increase' and C as 'energy of the products' or 'final energy'.
- b) About one third of the candidates did not gain this mark. Many wrote 'chemical', 'endothermic' or 'burning'.

Mark Ranges and Award of Grades

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