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General Certificate of Secondary Education

Chemistry 4421

CHY3F Unit Chemistry 3

Report on the Examination

2009 Examination – January Series

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Dr Michael Cresswell Director General.

Chemistry
Foundation Tier CHY3F

General

This was the third examination of the new Specification.

The mark scheme was flexible enough to allow candidates to express their answers in a variety of ways and still gain marks. However, the following questions proved particularly difficult for over 60% of candidates: Question 1(b)(iv) - naming the process of removal of hardness by adding a substance; Question 2(c) – why a hydrogen ion is a proton; Question 3(a)(i) – meaning of the word 'unsaturated'; Question 3(b)(i) - instrumental method used to identify elements or compounds; Question 5(a)(ii) – identification of chloride ions; Question 5(a)(iii) – why it is difficult to identify both potassium and sodium ions in a mixture using a flame test; Question 6(c) – which experiment was carried out on a different day; Question 6(g) – energy diagram.

Other questions that were poorly answered by at least 50% of the candidates were: Question 2(a) – why the universal indicator paper did not change colour with solid citric acid; Question 2(d) – the meaning of 'weak' in weak acid; Question 5(a)(i) – test for carbonate ions.

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

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

Question 1 *(Low Demand)*

Generally, this question was quite well attempted.

A large number of candidates in part (a) scored full marks here.

In part (b) the majority of the candidates scored the first mark but were unable to give the effect of limescale. Some candidates wrote 'limestone' instead of 'limescale' and quite a few candidates said that it 'rusted'.

Part (c) was quite well attempted. Some candidates wrote 'beaker' instead of 'flask' in part (i).

Question 2 *(Low Demand)*

A large number of candidates in part (a) wrote 'because it is a weak acid' or 'it is neutral'.

In Part (b) quite a few candidates got this mark but others wrote ' liquid', 'aqueous' or 'solution'.

Part (c) was very poorly attempted. A large number of candidates repeated the question by saying 'it is positively charged'. Some wrote 'it has only 1 electron' instead of saying 'it **loses** one electron'.

The majority of the candidates in Part (c)(i) scored this mark although a few wrote 'he repeated the test'.

In Part (e)(ii) quite a few candidates reversed the order and wrote 'BDAC'.

Question 3 *(Low Demand)*

In Part (b) this was quite poorly attempted. The common incorrect answers were 'flame test', 'universal indicator', 'limewater' and 'titration'.

The most common answers that scored marks in (b)(ii) were 'fast' and 'accurate'. Quite a few candidates mentioned that it was 'cheap' or 'safe'.

Question 5 *(Standard Demand)*

Part (a) was quite poorly attempted

In Part (a)(i) a large number of candidates did not know the test for carbonates. Many candidates wrote 'add lime water' and 'it will go cloudy'. Some candidates even wrote 'flame test'. They seemed to know that carbon dioxide was somehow involved/evolved and simply gave the test for carbon dioxide.

A large number of candidates in Part (a)(ii) wrote 'bubbles' or 'gas' while some suggested 'there will be a colour change'. Very few candidates knew that there would be a precipitate or a solid formed. Some lost marks by giving an incorrectly coloured precipitate.

Many candidates in Part (a)(iii) lost the mark here. They could not apply their knowledge of separate flame colours to a mixture. Many candidates wrote 'they have similar coloured flames' or 'they produce same coloured flames' while others suggested that 'it is low in sodium'. Some stated wrong colours for sodium and potassium.

Part (b) was quite well attempted. The majority of the candidates were able to pick out the relevant points from the passage.

In Part (a)(i) most candidates got the mark for 'essential mineral'.

The majority of the candidates in Part (a)(ii) gave two advantages for option 2 but many found it difficult to identify a disadvantage. The most commonly seen correct responses were 'preservation', 'taste' and 'flavour'. Some candidates wrote 'it is an essential mineral' while others talked in terms of the difficulty of removing salt from food and how expensive that would be.

Question 6 *(Standard Demand)*

Very few candidates gained a mark in part (a)(i). Some candidates gave the symbol with no charge while quite a few wrote chlorine. A few other incorrect named ions or atoms appeared occasionally.

For part (a)(ii) many candidates were aware that Universal Indicator could be used but were unable to give the correct colour changes. A large number of candidates used titration as their answer. Some also mentioned litmus. A few candidates talked in terms of number of atoms in each acid. Most correct responses came from reactivity differences. No candidates gave answers in terms of conductivity differences.

The candidates were able to pick out the points from the information given and almost all gained full marks on parts (b)(i) and (b)(ii).

Mark Ranges and Award of Grades

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