Examiners' Report
Principal Examiner Feedback

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Pearson Edexcel Combined GCSE
In Chemistry (1SC0) Paper 2CH

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In general, candidates started this paper well. In part 1(a)(i) a large proportion were able to give the electronic configuration of the atom of potassium and an even larger proportion were able to explain why potassium and calcium are in the same group in part (b). Where candidates did not score full marks in question (b) it was often because they referred to potassium and calcium having the same number of outer shells or stated that the two elements had the same number of electrons.

Part (c) was not as well answered with candidates still having some confusion between intramolecular and intermolecular forces. In some cases candidates did not score the second mark as they did not refer to the amount of energy required to separate the molecules, but stated that a low temperature would be needed to break the forces or that they could be easily broken which was not sufficient for the second mark point. The last part of question 1 was well answered by candidates with most scoring at least 2 or 3 marks. Where candidates lost a mark, it was often for making errors or omitting the state symbols. It seemed that candidates that made errors in the state symbols, were unaware of what they were and often gave additional numbers rather a wrong state symbol.

Candidates found question 2(a) quite difficult with the majority not scoring, many candidates had the misconception that the larger pieces of calcium carbonate had a larger surface area and so thought the rate was lower with a larger surface area. They performed much better in part (b) where they were asked to calculate the average rate of reaction. The majority of candidates scored the full three marks available, some candidates lost a mark as they did not convert the time from minutes to seconds. Part (c) of question 2 was a good discriminator with the full range of marks equally scored, weaker candidates could simply state that the particles moved faster, others knew this was due to them having more energy and the best were than able to link this to the occurrence of more frequent collisions between particles. Some candidates lost marks as they did not give a comparative and just stated that the particles move or collide but did not refer to the particles moving faster or more frequent collisions.

Part (a) of question 3 focused on the reaction of sodium thiosulfate and dilute hydrochloric acid. Candidates found it hard to explain why the mixture turns cloudy with the majority not scoring in part (i). A small number of candidates knew that a precipitate was formed but of these, not all knew that this was due to the production of sulfur. In some cases, candidates had thought that the solid precipitate formed was sodium rather than sulfur and therefore scored just the first marking point. In part (ii) candidates also struggled, with few being able to describe how the rate of reaction could be measured. Many missed the point of the question and started to describe changing the concentration and a notable proportion left this question blank. It was clear that those that had completed the experiment could answer it well and some had not seen the experiment, as generally answers scored the full three marks or did not score.

Question 3(b) also proved challenging, in part (i) many candidates thought that bromine rather iodine that caused the mixture to turn brown. Part (ii) was also poorly completed. A good proportion knew that reduction was the gain of electrons, but few knew that it was bromine that was reduced, with many thinking that it was iodine.

In part (b)(i) of question 4, candidates were asked to calculate the density of the argon. The vast majority of candidates knew that they needed to divide a mass by the volume. Of these around half missed the first step and so just divided the mass of the flask, with or without the stopper, by the volume therefore scoring the second mark point only. Part (ii) was more challenging still for candidates with very few scoring.

Candidates found part (c) much easier with the majority scoring both marks available, in some cases candidates gave the elements in correct order but decreasing rather than increasing in density and so scored just one mark. In part (d) a good proportion of candidates were able to balance the equation, fewer were able to add the formula of the magnesium ion to score both marks available.

In the last part of question 4, part (e), candidates found it hard to interpret the results of the tests to explain which mixture represented the early atmosphere. Many thought that mixture P represented the early atmosphere and so gained no marks. In some cases, learners did not read the data correctly and thought that mixture P formed the precipitate formed quicker, possibly missing the unit change from minutes to seconds.

Candidates found the part (a)(i) of question 5 slightly easier with many being able to score at least one mark, this was usually for stating that there would be fizzing or bubbling. In some cases candidates gave different synonyms for bubbling such as fizzing, bubbling and effervesce and so just gained 1 mark. Where learners did not score it was often that they stated what would be formed rather than what would be seen. In part (iii) candidates were asked to calculate the concentration of a rubidium hydroxide solution. Many candidates were able to score 1 mark, often for dividing the 8.5 by 2.5 but few understood that they needed to calculate the mass of the rubidium hydroxide first to gain full marks. In the last part of the question, part (b), candidates found it very hard to write the complete balanced equation with few scoring.

Question 6(a), proved very hard for candidates with many thinking that the apparatus showed fractional distillation. Very few could explain why the funnel became hot, what the liquid formed in tube A was or why the indicator went limewater cloudy. Some thought that acid rain was produced by the hydrocarbon which caused the limewater to turn cloudy. Candidates found question (b) easier with the majority of candidates scoring at least one mark. In some cases, candidates lost marks as they were careless with their working and made transcription errors from one part of the question to the next, some also clearly had not brought a calculator into the exam and had make silly mistakes in their working. Whilst error carried forward was allowed this meant that candidates did not score full marks.

Question 6(c) was the only extended open response on the paper. Candidates found discussing and comparing the impact on the environment of the emissions of the three cars quite straightforward with many bringing in their own knowledge and understanding of the effects and most scoring in level 2. Weaker candidates tended to simply state differences between engines, using the information from the table, leading to a mark in level 1. Better candidates, in addition to this, were able to explain some of the problems of the pollutants to gain a mark in level 2. Candidates in level 3 were able to explain why one of the engines caused the least or most damage to the environment, using information from the table and giving explanations of the problems to back their conclusion.