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Examiners' Report
Principal Examiner Feedback

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In Chemistry (Single Award) (4SS0) Paper 1C

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Q1

In (a) Candidates generally knew the charges on protons and electrons, although it was common to see + and - given, without a magnitude. The relative mass of the electron was frequently given as 0 or 1. As expected (b)(i) and (ii) proved very accessible although errors were seen in each part, such as suggesting the element was phosphorus in (ii). Part (b)(iii) proved more challenging with many incorrect charges on the ion being suggested.

Q2

In (a)(i) most candidates knew that the technique being shown was distillation. Some candidates suggested fractional distillation; others stated evaporation. In (ii) the most common correct answers involved the use a condenser. Incorrect suggestions included the use of a thermometer which was very common, heating faster and filtering. The determination of the R_f value in (b)(i) was done reasonably well. However, there was some confusion about which spot to use and so some had two or more different spot distances. Others had an incorrect solvent distance or had the calculation upside down. In (b)(ii) many candidates appreciated that using a different solvent was the key. However, some chose to change the temperature, or to add more solvent, which would not help to separate the dyes in ink D.

Q3

In (a) the changes of state were known by almost all candidates. In (b)(i) most candidates correctly showed the ring towards the right of the tube. Some incorrectly placed the ring to the left whilst a few candidates placed the ring near the centre. Part (b)(iii) candidates proved weak at using state symbols, despite all the required states being given in the question. Several responses contained symbols that were not *s*, *l* or *g*. Many of those that used correct state symbols frequently chose *s* or *l* for one of the gaseous species on the left, or *g* for solid ammonium chloride on the right. Part (b)(iv) was not well answered. Many responses were about rates of reaction, with candidates stating either that it was a slow reaction or that the temperature was too low. Many others just repeated the question by saying that it took time for the solid to form or for the gases to travel along the tube. Some discussed the different speeds of ammonia and hydrogen chloride particles.

Q4

In (a) the test for oxygen was well known by many, but candidates should know that the splint used needs to be "glowing" and not "burning". A burning splint cannot relight. Candidates should also note that the test result needs stating – so just stating "glowing splint test" does not gain the mark. Part (b) was poorly answered. Although it was quite common for one mark to be awarded for correct references to the 1 g of solid being left, only the best candidates gained full credit. Many just gave the definition of a catalyst. In (c) many fully correct curves were seen. The most common error was to show a volume greater than 40 cm^3, whilst a minority had their new curve all below the original one.

Q5

There were some very good answers to part (a). However, it was not uncommon for candidates to only test for one of the ions instead of both. Some used water instead of acid in the carbonate test.
Others added the limewater to the acid mixture, or the mixture to limewater. With some candidates there was confusion between sodium metal and a sodium compound as they described the reaction of sodium with water. A few suggested just testing with an indicator. In (b) a reference to a giant structure was often omitted. Some initially very good answers were then spoiled by later references to intermolecular forces or covalent bonds needing to be broken.

Q6

In (a) although there were some good answers, it was not uncommon to see descriptions of sharing of electrons. Of those that appreciated electron transfer was involved, many had a correct reference to chlorine gaining an electron but only had one electron being lost from the magnesium atom. The relative atomic mass calculation in (b)(i) was generally done well. Of those who could not do the calculation correctly, some just seemed to juggle the numbers at random whilst others tried to manipulate the answer to be 35.5 as shown in the Periodic Table. In (b)(ii) some candidates gained the mark by correctly referring to the same number of electrons but also unnecessarily referring to the same number of protons. Only very good candidates just mentioned the same electron configuration or the same number of outer shell electrons. Correct answers were common in (c)(i) but several candidates had contradictory answers e.g., exothermic because heat was taken in from the surroundings. In (c)(ii) a few candidates confused the idea of insulators and conductors, but this question was generally well-answered. The calculation of heat energy change in (c)(iii) was often done well with the most common error being the use of 1 instead of 100 for the mass.

Q7

In (a) most gave correct references to colour and boiling point but from some of the answers it seems that viscosity is sometimes confused with volatility. The equation in (b)(i) was often correctly balanced with 8 O_2 instead of 10 O_2 being the most common error. In (b)(ii) correct references to carbon monoxide reducing the capacity of blood to transport oxygen were often seen, but a minority gave answers about breathing difficulties or damage to the lungs. Part (b)(iii) was not well answered overall. There was some confusion evident with significant numbers discussing nitrogen as a common impurity in gasoline. Many others mentioned carbon and/or the production of carbon dioxide or carbon monoxide and then gave answers about global warming or the greenhouse effect. In (c)(i) it was common for either or both the extension bonds and the *n* to be omitted. Some structures still had a double bond between the carbon atoms. Although some did not refer to poly(ethene) being unreactive or inert, many good answers to (c)(ii) were seen with explanations concerning landfill and the non-biodegradable nature of poly(ethene) equally common.

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