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General Certificate of Secondary Education

Science B 4462 / Chemistry 4421

CHY1F Unit Chemistry 1

Report on the Examination

2008 Examination – June Series

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Science B / Chemistry
Foundation Tier CHY1F

General

There were eight questions on the paper. The first six were targeted at grades G, F and E. The last two were common to Foundation and Higher Tiers. They were targeted at grades D and C.

The mark scheme was designed to allow candidates to gain marks for showing knowledge, understanding and application of chemistry. The majority of candidates appeared to have sufficient time to complete the paper and very few questions were left un-attempted.

Basic knowledge and understanding of how science works in everyday situations, including in the laboratory, are tested throughout this paper. This means that it is essential that candidates read and analyse the information provided, then read the question before writing their response.

Question 1 *(Low Demand)*

The majority of candidates could correctly label the diagram of a hydrogen atom in part (a).

In part (b)(i) the majority of candidates understood that oxygen was reacting with hydrogen to form water.

Many candidates managed to gain the mark in part (b)(ii), however, there were many vague answers, such as, it does not harm the environment; hydrogen is environmentally friendly, which did not gain credit.

Question 2 *(Low Demand)*

For part (a)(i) most candidates knew that it is sulfur dioxide that causes acid rain. Most candidates did not know that smoke particles could cause global dimming in part (a)(ii).

In part (a)(iii) many candidates gained one mark for stating that it was the greenhouse effect or global warming that may cause climate change. However, candidates are confused between the greenhouse effect and the hole in the ozone layer. Only better candidates made reference to carbon dioxide.

Both bars were usually well drawn in part (b). The coal bar was sometimes drawn incorrectly, usually at 31 or 34 instead of 32.

Question 3 *(Low Demand)*

In part (a) most candidates knew that earthquakes are caused by movement of the Earth's tectonic plates. Few candidates knew that the movement of the tectonic plates is caused by heat released from natural radioactive processes.

The most common correct suggestion made in part (b)(i) was that some of the bodies had not been found for a variety of reasons. Very few mentioned that the tsunami covered a huge area or that there may be no accurate records of people or bodies. Some candidates misunderstood the question and explained how an estimate could be or was made.

In part (b)(ii) candidates were not always clear as to whether they were referring to the earthquake or the tsunami. Not many candidates managed to gain both marks here but many achieved a mark for statements related to the fact that earthquakes are not predictable. Several candidates thought that scientists were unable to detect or predict this earthquake because it occurred under the sea or ocean.

Question 4 *(Low Demand)*

The majority of candidates realised that the fruits or seeds of plants are crushed to extract the vegetable oil in part (a)(i). Most candidates did not gain a mark in part (a)(ii) because they described the process of filtering rather than suggesting why filtering is better than distillation. The common correct suggestions were that filtering is cheaper or quicker or does not require heating or energy.

Most candidates gained the mark in part (b)(i), the majority just stating that the vegetable oil and water are separate. Again most candidates gained full marks in part (b)(ii) for understanding that egg yolk would cause the vegetable oil and water to mix and form an emulsion.

Question 5 *(Low Demand)*

A significant number of candidates did not appreciate that hydrocarbons contain carbon and hydrogen for part (a)(i). In part (a)(ii) the candidates gaining both marks understood that a chain forms and connected more than two extra molecules to the two already in the box. Several candidates incorrectly drew pairs of molecules or drew lattice structures.

Most candidates scored at least one mark in part (b)(i), usually by stating that the tablet container was non bio-degradable. Landfill sites filling up was another popular correct suggestion with only a few candidates appreciating that it was a waste of a resource or that it could be recycled or reused.

In part (b)(ii) only a few candidates seemed to realise that it would be difficult to recycle the tablet container because it was made of two different polymers and therefore these polymers first needed to be separated.

Question 6 *(Low Demand)*

Most candidates do not know the meaning of the term smart alloy for part (a). Many gave the definition of alloy or stated that smart alloys can bend easily into any shape. However, there was a small number of candidates who did know that it was able to regain its original shape.

In part (b) most candidates did not gain any marks because they simply repeated what was given in the stem of the question, that is, copper is pure or brass is an alloy and contains copper and zinc atoms. Several candidates knew that brass was a mixture but very few candidates mentioned that the zinc atoms prevent the layers of copper atoms sliding over each other.

For part (c)(i) a small majority of candidates understood that carbon takes oxygen away from zinc oxide to leave zinc metal. Part (c)(ii) was poorly answered because many candidates suggested that the zinc and lead separate because lead melts before zinc. Those candidates who realised that these metals were separated because they have different boiling points gained one mark. The idea of separation by distillation was not evident in the majority of candidates' descriptions.

Question 7 *(Standard Demand)*

In part (a)(i) most candidates did not know the correct names for both products. Marks were awarded for writing correct formulae instead of names. For part (a)(ii) the name of the type of this chemical reaction was known by only a few candidates. Many candidates did not attempt this part.

Only the better candidates gained full credit for realising that when quicklime and water react the reaction is exothermic in part (b)(i). Frequent incorrect responses were water or quicklime reacting with the coffee or insulation. Many candidates stated that the solution heats up, which is in the stem of the question, rather than the heat is released or produced by the reaction. Several candidates thought that the coffee was already hot when put in the can and that the insulation kept it hot.

In part (b)(ii) the majority of candidates were able to suggest at least one chemical or physical reason why it was not possible to re-use the self-heating can.

Question 8 ***(Standard Demand)***

The information to answer part (a) was given in the table. Many candidates gained credit for this question, usually for short carbon chain length. Sometimes the word it was incorrectly used to refer to fuel oil, although some candidates correctly stated that fuel oil has larger molecules.

Information used from the table enabled most candidates to score marks in part (b). Many candidates stated that there was a high demand for petrol. Very few candidates mentioned that there was a short supply of petrol or that there was not much petrol in crude oil.

Several candidates did not attempt part (c) and not many candidates scored maximum marks. Few candidates were aware of the process of cracking and its effect of reducing the length of the carbon chains.

Mark Ranges and Award of Grades

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