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Examiners' Report/ Principal Examiner Feedback

November 2009

IGCSE

IGCSE Chemistry (4335) Paper 03

IGCSE Science (Double Award) (4437) Paper 08

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Question 1

This question was not as well answered as expected. While most candidates managed to name most of the items of apparatus correctly, it was not uncommon for the mortar to be named as a basin and sometimes the glass rod as a pipette. In (b) the most common error was to write about speeding up the dissolving the rock salt; since rock salt is the mixture made up of both soluble and insoluble substances, the rock salt will not dissolve, just the soluble component. Those candidates who used the table of data at the start of question 1 scored well, other seemed to ignore the information they were given and so struggled to name the substances obtained.

Question 2

In (a)(i) many candidates were able to use the information in the diagram to calculate the total volume of the air in the apparatus; however, it was not uncommon for candidates to miss out one of the three volumes that had to be added together. Most candidates gained the mark in (a)(ii), but some subtracted the 71 from 100 to get 29, while it was not uncommon for weaker candidates to state a volume of 70.1 – errors of this type were also seen elsewhere on this paper where thermometer scales had to be read. The majority of candidates who failed to score in (a)(iii) did so because they stated air (rather than oxygen) was reacting. The calculation in (a)(iv) proved too demanding for all but the best candidates, despite it just being a calculation of the percentage change in volume. In (b) some candidates failed to extract the important information from the results given, often including "student 1" etc. in the table rather than focussing on the masses. In (b)(ii) it was very common for candidates to think that the masses of the watch glasses had to be identical for it to be a fair test, rather than the mass of iron used. Part (c) was a good discriminator, and there were some excellent answers to (ii) ranging from all the water being evaporated to no oxygen left or all the iron having rusted; many of the answers were clearly explained. Part (iii) caused more problems, with the freezer often being stated – because it did not work. Marks were lost on the bar chart by candidates selecting the wrong set of data or in some cases using data from different weeks.

Question 3

Many of the answers in (a) did not refer to an item of apparatus, and so could not gain the mark. Often in questions of this type the improvement will involve an item of apparatus used to make a measurement – so the obvious improvement should have been one of the two instances in which a measuring cylinder was used. However, it was not uncommon for candidates to want to replace the boiling tube with a measuring cylinder – despite the fact the boiling tube is not used to make a measurement. Part (b) was well answered (although 43 was seen, as was 40.3 and 30.7), most candidates could state a property of hydrogen on which the method of collection shown depended. Parts (d)(i) and (ii) were well answered but in (iii) a very common answer was to insulate the boiling tube – this would make the problem worse since the reaction generates heat which we need to dissipate, not trap in the reaction mixture. As often seems to be the case, in (e) many candidates wanted to keep the independent variable (the concentration of the acid) constant – this is the one thing that must change. Candidates should try and use appropriate terminology – so "volume of acid" or "mass of magnesium" are better than "how much acid" or "how much magnesium". Part (f) was not as high scoring as expected; the results are reliable if repeats are similar – the concentration with the most similar repeats was 15% (a range of only 1). In (ii) a number of candidates did not ring just 1 result; when explaining what may have happened to cause an anomalous result candidates still need to be remained that the explanation must give an error in the correct direction (so "timed for less than 20 seconds" would be fine, since the volume collected was too small, but "timed it wrongly" would not score). Most candidates scored the mark in (f)(iii). The graph in (g) was, in general, very poorly done. Many candidates plotted one or two points incorrectly (a good way to check is

to plot the points and then, when all have been plotted, to go back over them, reading the co-ordinates of each point from the graph and checking they give the values in the results table). The instructions stated clearly that the best fit lines should be curves, despite this many candidates drew straight lines of joined the points dot to dot. In (h)(i) some candidates just gave the co-ordinates of their highest plotted point rather than red the value from where their lines crossed on the graph. (h)(ii) was well answered, most gained the mark, those who did not often multiplied the rate by the concentration from (i) rather than multiplied the rate by 20. Part (h)(iii) was not well answered; many candidates answered a question from a previous paper (where more readings around the turning point of a graph have been required). In this question candidates had to say how they would check the volume they have given in (ii) was correct for the concentration they had stated in (i) – the way to do this is to do the experiment with that specific concentration and measure the volume of gas, not to do lots of concentrations around that area, since that does not answer the question asked (lots of readings around that concentration would be the correct thing to do if we had asked how could you be certain the concentration in (i) gives the highest rate).

CHEMISTRY 4335, GRADE BOUNDARIES

Option 1: with Written Alternative to Coursework (Paper 3)

	A*	A	B	C	D	E	F	G
Foundation Tier				64	51	38	25	12
Higher Tier	74	62	50	39	25	18		

Option 2: with Coursework (Paper 04)

	A*	A	B	C	D	E	F	G
Foundation Tier				N/A	N/A	N/A	N/A	N/A
Higher Tier	N/A	N/A	N/A	N/A	N/A	N/A		

No candidates entered coursework so there are no grade boundaries for this option.

Note: Grade boundaries may vary from year to year and from subject to subject, depending on the demand of the question paper.

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