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Examiners' Report/ Principal Examiner Feedback

Summer 2010

IGCSE

IGCSE Chemistry (4335) Paper 03

IGCSE Science (Double Award) (4437) Paper 08

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4335 Paper 03 Chemistry Report – Summer 2010

General Comments

Questions in this paper are targeted at full range of grades from G to A*.

Question 1

The printing error in part (a) went unnoticed by almost all candidates, who correctly chose H as the letter identifying the pipette. To avoid disadvantaging the handful of candidates who might have followed the instructions and chosen from the letters A to G, this mark was awarded to all candidates; as this part is targeted at grade G it was not expected to discriminate. Although the great majority of candidates correctly read the burettes in (c), a significant number omitted the trailing zero from 1.80 or wrote down the readings in the wrong order. It was disappointing to see answers of 2.2 and 21.35 from candidates who presumably have had little experience of handling burettes. In spite of similar questions having been set in most previous papers, it was disappointing in (d) to see every possible combination of ticks; apart from the correct choice, the commonest combinations were all four, the first three and the last three. Many of these candidates scored consequential marks in the calculation, although quite a number did not give the final answer to the expected 2 decimal places. A handful averaged the final burette readings instead of the titres.

Question 2

Part (a) was generally well answered, with the vast majority of candidates identifying the evolution of carbon dioxide as the reason for the loss of mass; the commonest error was the loss of water. Answers to (b) were usually correct, with most candidates identifying the correct experiments, although with some failing to refer to the correct masses or heating periods. Part (c) was well answered, with the commonest error being to give 2.1 g as the mass of zinc oxide obtained.

Question 3

In (a), almost all candidates recognised the insulating properties of polystyrene as its advantage over glass; the commonest error was to suggest that the glass beaker needed protection from the large amount of heat produced in the reaction. The thermometer readings in (b) were invariably correct, as was the advantage of a burette over a measuring cylinder in (c).
In (d) there were few errors in plotting the points, but a substantial number of errors were seen in the drawing of the lines; the first line sometimes did not start from the origin, or deviated via the anomalous point, while the second line often started from the point at 29.0 ºC - sometimes it was bent at 25 cm^3 to allow the last three points to appear on a straight line. The reading off the graph questions in (e) were usually correct, sometimes consequentially on an incorrect crossing point in the graph.
The explanations in (f) proved a challenge to many candidates, with few scoring all 5 marks (although most scored at least 1 mark). In (f)(ii), most recognised that if more acid had been added then the temperature would have been greater than expected, and not smaller. In (f)(iii), many answers simply repeated that the concentration could not have been wrong, without pointing out that it was being added from the same burette or that later results would be affected. In (f)(iv), many wrote that adding sodium hydroxide would have increased the recorded temperature, although there were plenty of correct answers that pointed out that the temperature would have decreased (stating that the temperature would not have changed was also accepted). Many answers in (f)(v) were based on stirring increasing the rate of reaction, but

most candidates in (f)(vi) recognised that heat loss might have occurred. There were very few errors in the calculations in (g), the commonest being the incorrect conversion from joules to kilojoules (dividing by 100, multiplying by 1000).

Question 4

There were very few errors in drawing the bar chart in (a), the commonest being to use an occasional relative formula mass value instead of a % value; some bars were unlabelled (penalised) and others were drawn with different widths based on using a horizontal scale (not penalised). Part (b)(i) was, not unexpectedly, the least well answered question on the paper; the recognition that the data was not continuous, or that intermediate values were not possible, was very much centre-dependent.
Answers to part (c) were often disappointing, for many reasons. First, few candidates picked up on the "outline" in the question wording and the limited number of answer lines provided, and wrote long and detailed rambling answers that continued on additional sheets. Second, the reference in the question to combustion of magnesium was ignored, and answers involved the decomposition or reduction of magnesium oxide. Third, the reference "by mass" was ignored, with many descriptions of measuring the volume of oxygen collected in a syringe. Fourth, the description of calculations was often confusing, with the mass of the oxide being subtracted (sometimes "minused") from the mass of the metal. Candidates should be encouraged to answer questions of this type by means of numbered steps or bullet points (as used in questions 2 and 3). It is worth quoting a very brief answer that would score full marks:

- Weigh some magnesium
- Heat it in a crucible until it has reached constant mass
- Subtract the mass of magnesium from the mass of magnesium oxide to find the mass of oxygen
- Divide the mass of O by the mass of MgO and multiply by 100

CHEMISTRY 4335, GRADE BOUNDARIES

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

	A*	A	B	C	D	E	F	G
Foundation Tier				55	44	33	22	11
Higher Tier	78	65	52	39	27	21		

Option 2: with Coursework (Paper 04)

	A*	A	B	C	D	E	F	G
Foundation Tier				58	46	34	23	12
Higher Tier	79	67	55	43	30	23		

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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