

Examiners' Report/ Principal Examiner Feedback

Summer 2010

IGCSE

IGCSE Chemistry (4335) Paper 1F

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4335 Paper 1F Chemistry Report - Summer 2010

General Comments

Questions 1 - 7 are targeted at grades G to E, and questions 8 - 11 at grades D to C.

Question 1

In (a), although most candidates could identify the sub-atomic particles and name the central part of an atom, far fewer could use the diagram to deduce the atomic and mass numbers of the atom. Most of those who got the atomic number correct were also able to write the electronic configuration.

Question 2

In (a), many suggestions about the origins of nitrogen (crude oil, water) and hydrogen (air, earth) were impossible. Part (b) was better answered, with most knowing the conditions used in the Haber process and the factors needed to increase the rate of the reaction.

Question 3

Relatively few candidates could identify the other two elements in an NPK fertiliser, and many answers to the environmental aspects of oxides of nitrogen seemed to be random.

Question 4

This test for carbon dioxide was usually correct, but hardly any candidates could write the word equation for the decomposition of copper(II) carbonate - many included oxygen as a reagent, but the commonest error was to give "metal oxide" instead of copper(II) oxide.

Question 5

In (a), the selection of compounds used to prepare barium carbonate often included those containing no barium or carbonate, while in (c) very few realised that after filtration in (b), washing and a method of drying were needed.

Question 6

Part (b) tested candidates' grasp of the relationship between boiling point and the strength of intermolecular forces, and a pleasing number showed partial or complete understanding of this. The dot and cross diagrams of water were often correct, although with weaker candidates omitting some of the electrons in oxygen. Answers to part (d) were disappointing, with several different colours seen in (i) - sometimes the correct colours in the wrong order.

Question 7

Answers to part (a) were generally correct, and the usual errors appeared in (b) - candidates need to state "only" or equivalent wording when referring to the hydrogen and carbon atoms in a hydrocarbon, and just stating that saturated compounds contain single bonds is insufficient (again, "only" is needed). Very few candidates could deduce the structure of ethene from the provided section of poly(ethene). Hardly any could complete the equation for the formation of ethanol, even though the corresponding names were given in the question.

Question 8

In part (a), most candidates were able to give a correct observation for each metal reaction, although the names and formulae in (b) were much less often correct. Although most candidates scored both marks in (c) for the hydrogen test, a significant number gave the test for oxygen or just used a phrase such as "squeaky pop test" without any reference to a flame or ignition. The colours in (d) were generally well known, but the ion formula was often given as Na^+ instead of OH^- .

Question 9

This question was based on oxygen. The decomposition of hydrogen peroxide is commonly met in work on catalysis while studying rates of reaction and candidates were familiar with the reaction. However, errors in identifying the solid were more common than errors in identifying the solution - potassium manganate(VII) was often given, there were errors in the oxidation state of the manganese and there was some confusion between manganese and magnesium. Most candidates' answers showed that they were familiar with the syringe and catalyst in (b) and (c). Answers to (d) were disappointing, with very few identifying all four state symbols correctly, especially given that the reagent G was described as a solution, and that water (unless ice or steam) always has the liquid state symbol. Lead(II) sulphide and lead(II) sulphate were often confused, even though both names and formulae were given in the question. The poorest answers in (e) were the colours in the sulphur dioxide test.

Question 10

Answers to part (a) again revealed the scale of confusion in many candidates' minds about chemical bonding, with many using atoms, ions and molecules indiscriminately; it was hoped that the inclusion of "ionic" in the first line would point candidates in the right direction. The best candidates managed to score full marks, although some otherwise good answers were spoiled by the inclusion of covalent bonds or shared electrons. In part (b), most candidates scored at least 1 mark for the choice of magnesium, although quite a number chose chlorine. Very few answers scored full marks in (c) - the commonest omission was the existence of oppositely charged ions.

Question 11

In part (a), although most knew the term fractional distillation, most of the attempts to describe the process scored very few marks. There was widespread confusion with other industrial processes, especially the extraction of iron in the blast furnace, and many answers contained references to air, water, coke, slag and catalysts. Even those who avoided these errors often omitted vital points such as the need to heat the crude oil, and many references to up and down, or top and bottom, failed to mention any kind of container, let alone a tower or column; crude oil was often filtered or poured into a tank. This is in contrast to answers to similar questions in previous sessions, where marks were often lost for describing cracking or a laboratory process. Part (b) was answered little better, with the use of bitumen in road making being the only mark gained by many candidates. The word equation for the combustion of octane on (c) discriminated well, with better candidates scoring full marks; common errors were the formation of carbon or octane oxide. In (d), there were several careless errors in writing the general formula of the alkanes, including $C_nH_{2n} + 2$. The question asking for characteristics of a homologous series also discriminated well; the commonest errors were the failure to use "same" or "similar" correctly - these terms should be used for chemical properties but not physical properties, where the idea of gradation or gradual change is expected. Quite a number overlooked the "other" in the question and gave "same general formula" as an answer.

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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