

Examiners' Report/ Principal Examiner Feedback

Summer 2010

IGCSE

IGCSE Science (Double Award) (4437) Paper 2F

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4437 Double Award Science (Chemistry) Paper 2F Report - Summer 2010

General Comments

Questions 1 - 6 are targeted at grades G to E, and questions 7 - 9 at grades D - 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

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 4

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 5

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 6

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).

Question 7

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 K^+ instead of OH^- .

Question 8

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. 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 $C_nH_{2n} + 2$.

Question 9

Most candidates were able to write the correct electronic configurations of magnesium and chlorine, but answers to part (b) 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 (c), 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 (d) - the commonest omission was the existence of oppositely charged ions.

SCIENCE (DOUBLE AWARD) 4437, GRADE BOUNDARIES

Option 1 : with Paper 7 (Biology) & Paper 8 (Chemistry)

	A*	A	B	C	D	E	F	G
Foundation Tier				54	44	34	24	14
Higher Tier	80	68	56	45	36	31		

Option 2 : with Paper 7 (Biology) & Paper 9 (Physics)

	A*	A	B	C	D	E	F	G
Foundation Tier				53	43	33	24	15
Higher Tier	80	68	56	45	36	31		

Option 3 : with Paper 8 (Chemistry) & Paper 9 (Physics)

	A*	A	B	C	D	E	F	G
Foundation Tier				52	42	32	23	14
Higher Tier	79	67	55	43	34	29		

Option 4: with Coursework (Paper 10)

	A*	A	B	C	D	E	F	G
Foundation Tier				55	44	34	24	14
Higher Tier	82	70	58	47	37	32		

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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