GCSE

Specimen Papers and Mark Schemes

Edexcel GCSE Chemistry A (1530)

For First Examination

Summer 2003

Edexcel

Success through qualifications

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information please call our Customer Response Centre on 0870 240 9800, or visit our website at www.edexcel.org.uk

Autumn 2000

Publications Code UG 009328

Contents

Centre Number						Paper Reference **1522/2F**		Surname	Other Names
Candidate Number						Paper Reference **1530/1F**		Signature	

For Examiner's use only

For Team Leader's use only

1522/2F 1530/1F

Edexcel GCSE

Science: Double Award A **[1522]**
Paper 2F

Chemistry A **[1530]**
Paper 1F

FOUNDATION TIER
Specimen Paper

Time: 1 hour 30 minutes **N0000**

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your signature, your surname and other names, then tick the box to show the correct paper reference for your examination.

The paper reference is shown below the boxes. If more than one paper reference is shown, you should tick the one for which you have been entered.

Answer ALL questions in the spaces provided in this book.

Show all stages in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This paper has 10 questions. There are no blank pages.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

Additional Answer Sheets may be used.

Turn over

Edexcel
Success through qualifications

THE PERIODIC TABLE

Period	1	2	Group										3	4	5	6	7	8
1																		
								1 H Hydrogen 1										4 He Helium 2
2	7 Li Lithium 3	9 Be Berylium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
3	23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
4	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
5	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
6	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
7	223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key

Relative atomic mass
Symbol
Name
Atomic number

Leave blank

Leave blank

1. (a) Use the periodic table to give:

(i) the symbol for an atom of sulfur; .....

(1)

(ii) an element in the same group as sodium; .....

(1)

(iii) an element in group 2; .....

(1)

(iv) an element in group 6; .....

(1)

(v) the atomic number of neon; .....

(1)

(vi) an element in period 2. .....

(1)

(b) Elements in the periodic table are classified as metals or non-metals.

Give the names of **two** non-metallic elements.

1 .....

2 .....

(2)

(Total 8 marks)

TURN OVER FOR QUESTION 2

Leave blank

2. (a) Circle the correct formula for each of the following gases.

water vapour	HO	H_2O	HO_2
nitrogen	N	N_2	N_3
carbon monoxide	CO	C_2O	CO_2

(3)

(b) Millions of years ago, the atmosphere contained:

carbon dioxide	**carbon monoxide**	**hydrogen**
nitrogen	**water vapour**	

(i) What originally produced these gases?

.....

(1)

(ii) The amounts of these gases have changed over millions of years.
State **two** of these gases which have decreased.

1 .....

2 .....

(2)

(iii) Name the gas, **not** on the list, which now makes up about 20% of the atmosphere.

.....

(1)

(c) Describe a test for carbon dioxide.

.....

.....

.....

.....

(2)

(d) Photosynthesis changes the amount of oxygen and carbon dioxide in the atmosphere.
How does photosynthesis change the amount of:

(i) oxygen; .....

(1)

(ii) carbon dioxide? .....

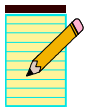
(1)

(Total 11 marks)

Leave blank

3. A small piece of sodium is dropped into a large beaker of water.
It reacts to form sodium hydroxide solution and a gas.

(a) Describe **three** things you would **see** in this experiment.



.....

.....

.....

.....

.....

.....

.....

.....

(4)

(b) Give the name of the gas formed by this reaction.

.....

(1)

(c) Sodium hydroxide solution has a pH of 14.

Complete the sentence using a word from the box.

acidic	**alkaline**	**neutral**

Sodium hydroxide solution is .....

(1)

(d) The reaction between sodium and water is exothermic.

How would the temperature of the water change during the reaction?

.....

(1)

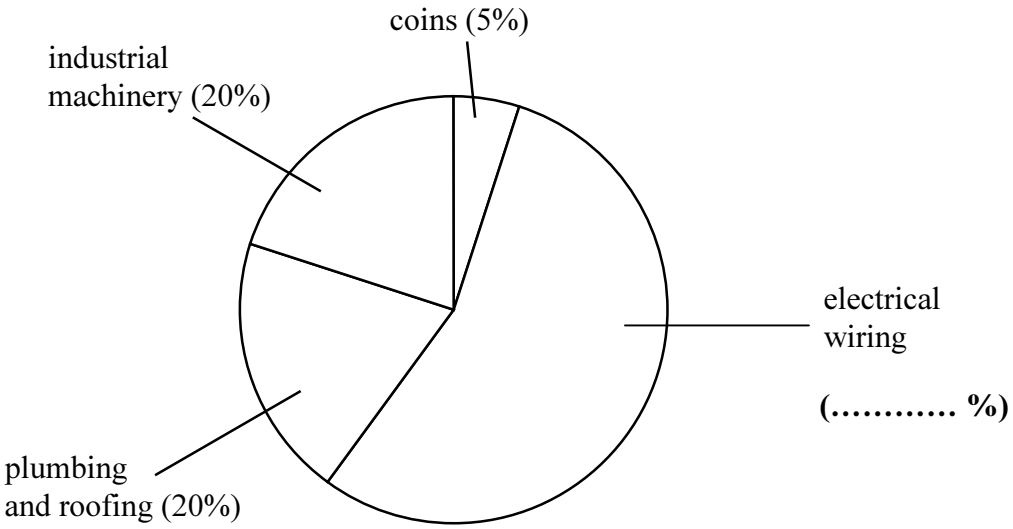
(Total 7 marks)

TURN OVER FOR QUESTION 4

Leave blank

4. (a) The pie chart shows some of the main uses of copper.

(i) Complete the pie chart to show the percentage of copper used in electrical wiring.



(1)

(ii) What property of copper makes it suitable for use in electrical wiring?

.....

(1)

(iii) What property of copper makes it suitable for use in water pipes?

.....

(1)

Leave blank

(b) Copper can be made by reduction of copper oxide.

In this process copper oxide is heated strongly with another substance.

(i) Complete the word equation for the process.

copper oxide + ……... ⟶ copper + carbon dioxide

(1)

(ii) Write the chemical formula, with state symbol, for carbon dioxide gas.

.....

(2)

(iii) What is meant by reduction?

A addition of oxygen to a compound

B conversion of a compound into its elements

C heating a compound strongly

D removal of oxygen from a compound

Write the correct answer (**A**, **B**, **C** or **D**) in the space provided.

.....

(1)

(Total 7 marks)

TURN OVER FOR QUESTION 5

Leave blank

5. The table gives information about four hydrocarbons.

Name of hydrocarbon	Number of carbon atoms in one molecule	Boiling point (°C)
ethane	2	-90
propane	3	-40
butane	4	0
hexane	6	+70

(a) (i) Which element, other than carbon, is present in hydrocarbons?

.....

(1)

(ii) Which of these hydrocarbons has the lowest boiling point?

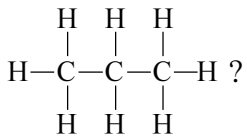
.....

(1)

(iii) Which of these hydrocarbons has the biggest molecules?

.....

(1)

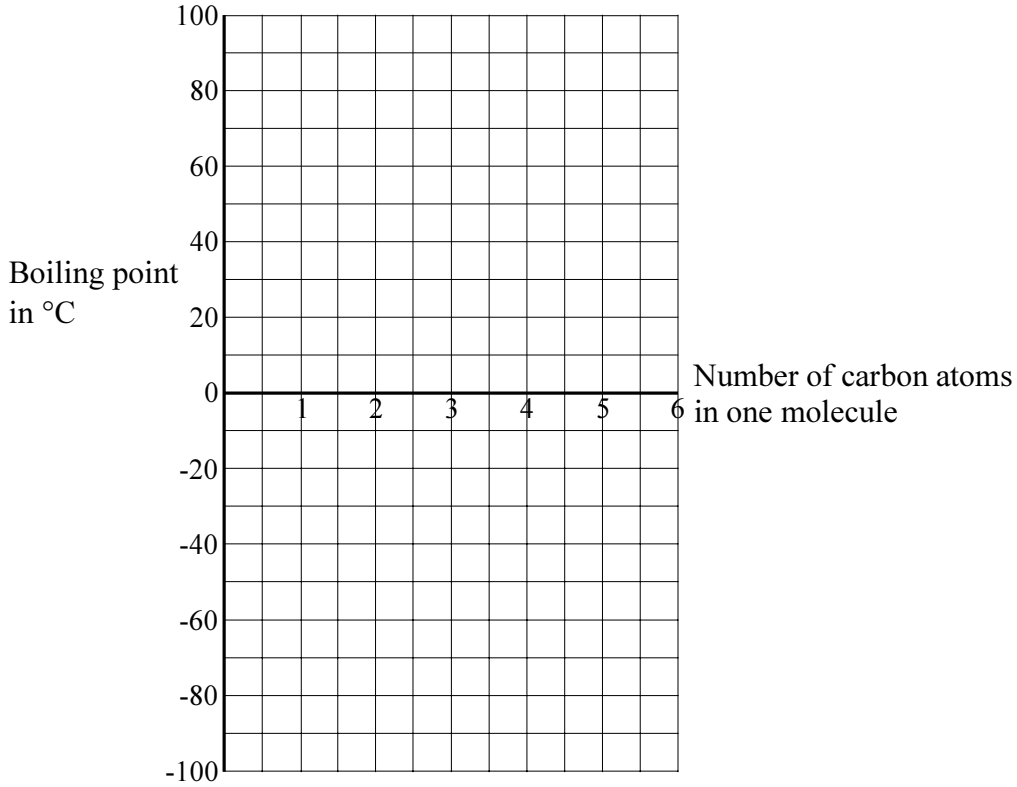
(iv) Which of these hydrocarbons has molecules with the structure  ?

.....

(1)

Leave blank

(b) (i) Use the information in the table opposite to draw a graph on the grid.



(3)

(ii) Pentane is a hydrocarbon with five carbon atoms in each molecule.
Use your graph to estimate the boiling point of pentane.

..... °C

(1)

(c) Some of these hydrocarbons are present in petroleum gas which is obtained from crude oil.

(i) Name the process used to separate petroleum gas from crude oil.

.....

(2)

(ii) Name **two** other fuels obtained from crude oil by this process.

1 .....

2 .....

(2)

(d) Ethane gas burns in air.

Complete the word equation for this reaction.

ethane + ……... ⟶ carbon dioxide + ……

(2)

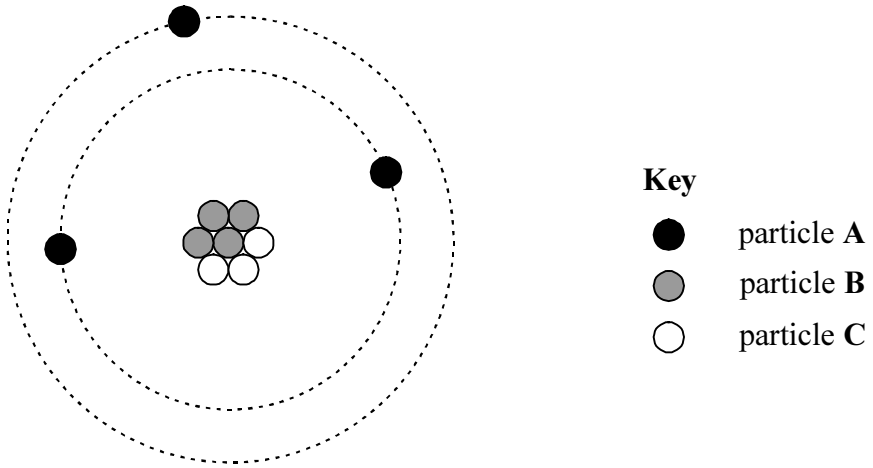
(Total 14 marks)

Leave blank

BLANK PAGE

Leave blank

6. (a) The diagram shows the arrangement of particles in an atom of the element lithium.



(i) Identify the particles **A**, **B** and **C**.

Particle **A** .....

Particle **B** .....

Particle **C** .....

(3)

(ii) What is the mass number of the atom in the diagram?

.....

(1)

(iii) Use the diagram to explain why this element is in group 1 of the periodic table.

.....

.....

(1)

(b) Another element in group 1 is sodium.
Sodium reacts with chlorine (Cl_2) to form sodium chloride (NaCl).
Write a balanced equation for this reaction.

.....

(2)

(Total 7 marks)

TURN OVER FOR QUESTION 7

Leave blank

7. (a) Use the periodic table provided to give the electronic structure of a chlorine atom and a chloride ion.

chlorine atom	chloride ion

(4)

(b) Sodium chloride is an ionic compound containing sodium ions and chloride ions.

Explain why ionic compounds have high melting points.

.....

.....

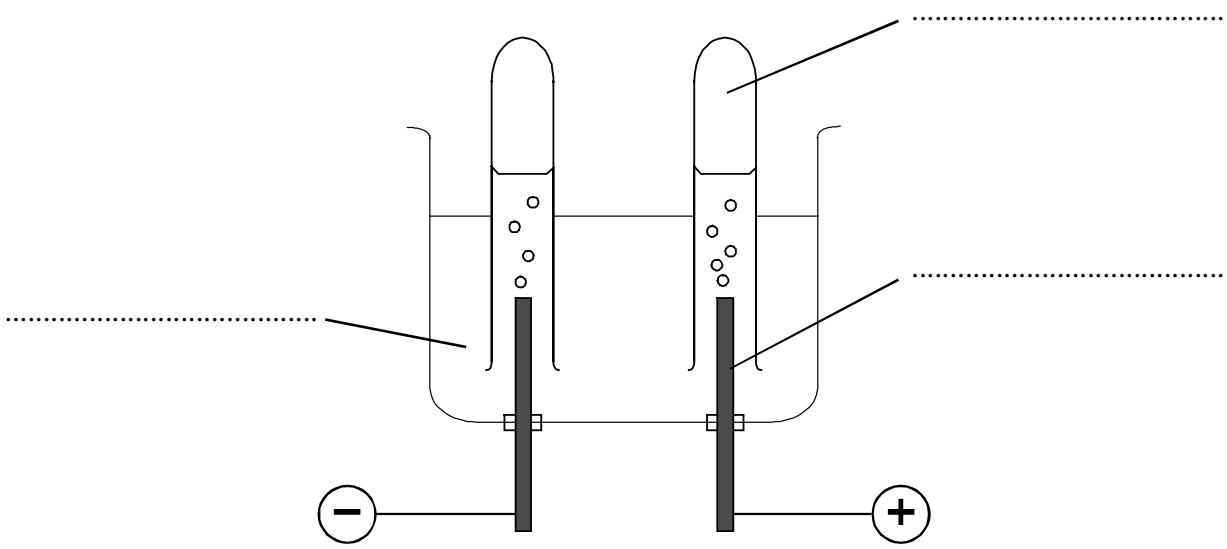
.....

.....

(2)

Leave blank

(c) When aqueous sodium chloride is electrolysed, hydrogen and chlorine gases are produced.
Label this diagram which shows the apparatus used to electrolyse aqueous sodium chloride.



(3)

(d) Describe a test for each of the gases formed.

Test for hydrogen .....

.....

.....

.....

Test for chlorine.....

.....

.....

.....

(4)

(e) In the industrial electrolysis of concentrated sodium chloride solution, three products are formed. Hydrogen and chlorine are two of the products.

Name the other product.

.....

(1)

(Total 14 marks)

Leave blank

8. The passage below is about the extraction of aluminium.

> Aluminium is the most common metallic element in the Earth's crust. In 1886, an inexpensive process for obtaining aluminium from its ores was invented by Charles Hall in the USA.
>
> As a 22 year old college student, Hall had become interested in the problem of producing aluminium. At that time, despite the abundance of aluminium compounds in nature, metallic aluminium was selling for about the same price as silver.
>
> Hall reasoned that aluminium oxide would be a good starting material from which to make aluminium. Some years later he said, 'The idea formed itself in my mind that if I could get a solution of aluminium oxide in something which contained no water, this would probably give a liquid from which aluminium could be obtained by electrolysis'.
>
> Working with home-made equipment, Hall made his first tiny globules of aluminium in a woodshed behind his parents' house. Within five years, the price of the metal had dropped to about a tenth of its former price.

(a) Suggest why silver is still expensive.

.....

(1)

(b) Hall's first reaction in February 1886 was done on a very small scale.

Give **one** piece of evidence from the passage to support this.

.....

(1)

(c) Large amounts of heat energy are taken in during the production of aluminium.

What word is used to describe this energy transfer?

A decomposition

B electrolysis

C endothermic

D exothermic

Write the correct answer (**A**, **B**, **C** or **D**) in the space provided.

.....

(1)

Leave blank

(d) Explain, using the passage and your knowledge of the reactivity series, why aluminium has only been used on a large scale since about 1890.

.....

.....

.....

.....

.....

.....

.....

.....

(4)

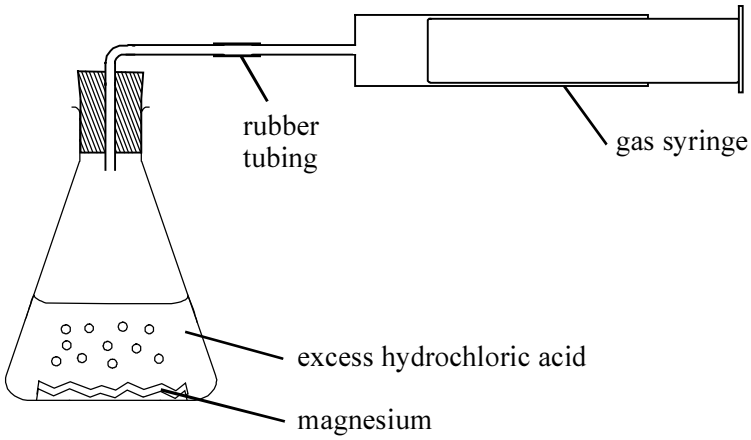
(Total 7 marks)

TURN OVER FOR QUESTION 9

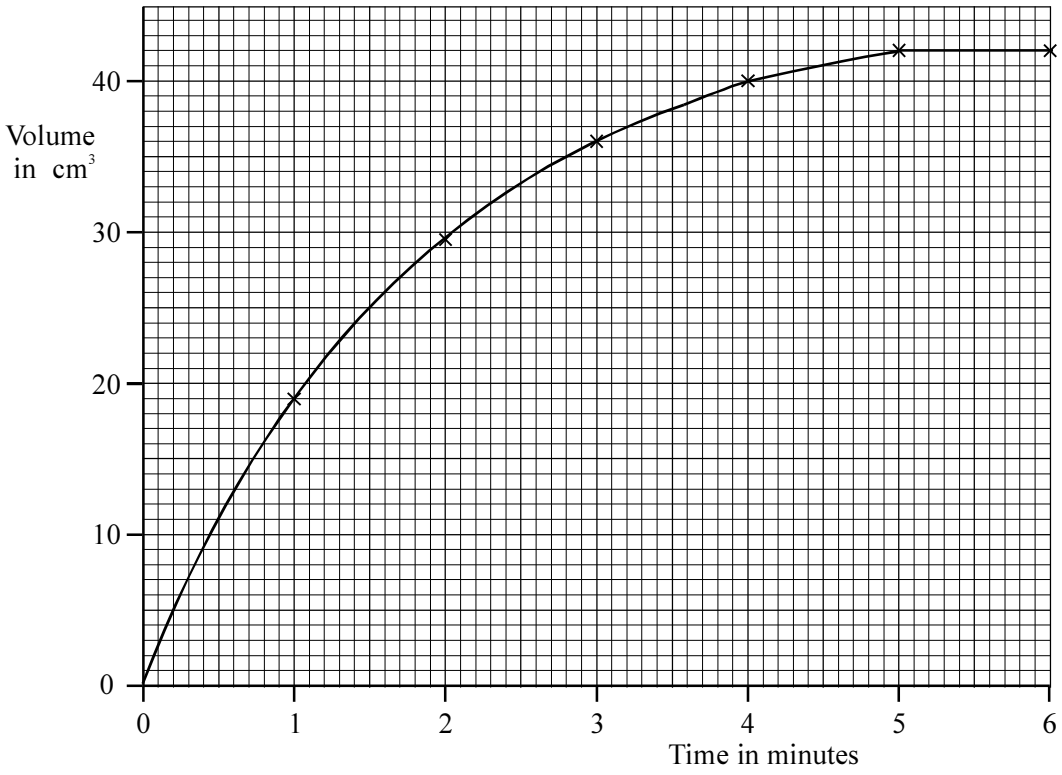
Leave blank

9. Magnesium ribbon reacts with hydrochloric acid to produce hydrogen.

A student used an excess of hydrochloric acid in the apparatus below to investigate this reaction.



His results are shown on the graph.



(a) What volume of gas was in the syringe at the end of the reaction?

.....

(1)

Leave blank

(b) State how the rate of reaction changes during the first **four** minutes and explain the change.

.....

.....

.....

.....

(2)

(c) The experiment was repeated using the same quantities of reagents but with the acid at a higher temperature.

Draw on the graph the line that should be obtained at this temperature.

(2)

(d) Some power stations burn coal in the production of electricity. The coal is ground to a fine powder before being burned in the furnace.

Use your knowledge of rates of reaction to suggest why the coal is ground to a fine powder rather than used in large lumps.

.....

.....

.....

.....

(2)

(Total 7 marks)

TURN OVER FOR QUESTION 10

Leave blank

10. Ammonia is made using the Haber process.

(a) The equation for the reversible reaction is:

$$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$$

What is the source of the nitrogen used in the Haber process?

.....

(1)

(b) The hydrogen used in the Haber process is obtained by heating methane with steam:

$$CH_4(g) + H_2O(g) \longrightarrow 3H_2(g) + CO(g)$$

What is the source of the methane gas for this reaction?

.....

(1)

(c) (i) Most of the ammonia produced is reacted with acids to form fertilisers.

Write a balanced equation for the reaction of ammonia with nitric acid.

.....

(3)

(ii) Why do most farmers add fertilisers to their crops?

.....

(1)

(iii) Excess fertiliser is washed off fields into rivers.

State **two** consequences of this.

1 .....

.....

2 .....

.....

(2)

(Total 8 marks)

TOTAL MARKS 90

END

Centre Number						Paper Reference **1530/2F**		Surname	Other Names
Candidate Number								Signature	

For Examiner's use only

For Team Leader's use only

1530/2F

Edexcel GCSE

Chemistry A [**1530**]

Paper 2F

FOUNDATION TIER

Specimen Paper

Time: 1 hour **N0000**

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
Total	

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your signature, your surname and other names.

The paper reference is shown below the boxes.

Answer ALL questions in the spaces provided in this book.

Show all stages in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This paper has 7 questions. There are no blank pages.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

Additional Answer Sheets may be used.

Turn over

Edexcel
Success through qualifications

THE PERIODIC TABLE

Period	Group 1	2											3	4	5	6	7	8
1	1 H Hydrogen 1																	4 He Helium 2
2	7 Li Lithium 3	9 Be Berylium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
3	23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
4	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
5	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
6	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
7	223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key

Relative atomic mass
Symbol
Name
Atomic number

Leave blank

1. Use names from the box to answer the questions.

Each substance may be used once, more than once or not at all.

ammonia	**argon**	**carbon dioxide**
hydrogen	**hydrogen chloride**	**oxygen**

Name the gas that:

(a) gives a squeaky pop when ignited; .....

(1)

(b) relights a glowing splint; .....

(1)

(c) turns red litmus paper blue; .....

(1)

(d) turns limewater milky; .....

(1)

(e) turns blue litmus paper red; .....

(1)

(f) has monatomic particles. .....

(1)

(Total 6 marks)

2. Fill in the gaps to complete the passage below.

Ethanoic acid can be formed from ethanol by …… . A dilute solution of ethanoic acid is used to pickle foods, such as onions. The everyday name for this solution is …… . In pickles, this solution is being used to …… the food.

(3)

(Total 3 marks)

Leave blank

3. Two students made the insoluble salt, lead sulfate, and wrote these notes about the experiment.

> 'We took 25 cm^3 of lead nitrate solution and slowly added 25cm^3 of acid to it. The mixture turned cloudy white. We stirred the mixture and filtered it to obtain the solid lead sulfate.'

(a) Describe **one** safety precaution which the students should take during this experiment.

.....

.....

(1)

(b) (i) Which acid was added to lead nitrate solution to make lead sulfate?

A hydrochloric acid

B nitric acid

C sulfuric acid

Write the correct answer (**A**, **B**, or **C**) in the space provided.

.....

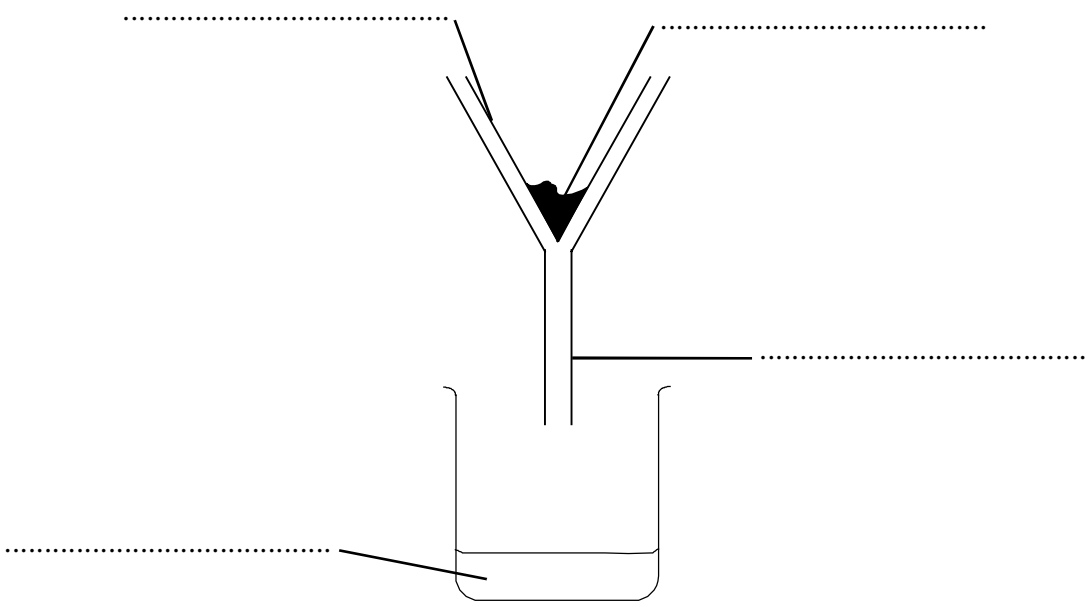
(1)

(ii) Draw, and name, the piece of apparatus that should be used to measure 25 cm^3 of the acid.

(2)

Leave blank

(c) Label the diagram below which shows the mixture being filtered to obtain solid lead sulfate.



(4)

(Total 8 marks)

TURN OVER FOR QUESTION 4

Leave blank

4. (a) Aluminium metal has a number of properties which make it useful.

Give **two** properties, in each case, which make it useful for:

(i) overhead electricity cables;

1 .....

2 .....

(2)

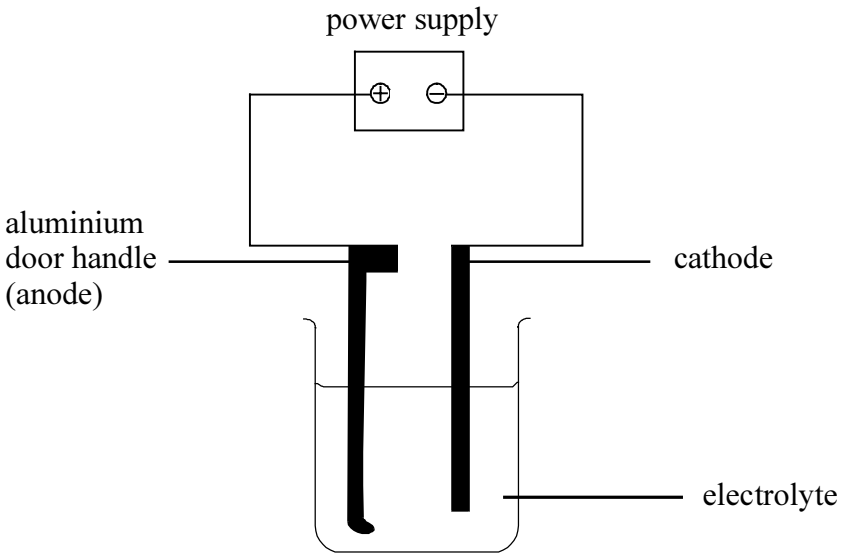
(ii) window frames.

1 .....

2 .....

(2)

(b) A diagram of a simple experiment to anodise an aluminium door handle is shown below.



(i) Suggest **two** reasons for anodising aluminium objects.

1 .....

.....

2 .....

.....

(2)

Leave blank

(ii) Complete the word equation for the reaction occuring when aluminium is anodised.

aluminium + oxygen ⟶ ……

(1)

(iii) Name a suitable material for the cathode.

.....

(1)

(iv) Name an electrolyte for this experiment.

.....

(1)

(Total 9 marks)

TURN OVER FOR QUESTION 5

Leave blank

5. (a) Sulfuric acid is manufactured by the Contact process.

Use words from the box to complete the paragraph below.

Each word may be used once, more than once or not at all.

air	**sulfur**	**sulfur dioxide**
sulfur trioxide	**sulfuric acid**	**water**

The raw materials for the Contact process are …… and ……

They are heated together to form ……

More air and …… are then heated and passed over the catalyst.

The catalysed reaction produces ……

(5)

(b) State **two** uses of sulfuric acid.

1 .....

.....

2 .....

.....

(2)

(Total 7 marks)

Leave blank

6. (a) Complete the table which shows the tests for some ions in solution.

Name of ion in solution	Reagent added to the solution	Positive result
copper (II)	…… ……	light blue precipitate
……..	dilute nitric acid + silver nitrate solution	white precipitate
sulfate	……+ ……	…….. ……..

(5)

(b) Describe a test to show the presence of ammonium ions in ammonium chloride.

……

……

……

……

……

……

……

……

……

(5)

(Total 10 marks)

TURN OVER FOR QUESTION 7

Leave blank

7. Ethanol is used as a solvent for perfumes and other cosmetics.

(a) (i) Suggest **one** advantage which ethanol has over water as a solvent in perfumes.

.....

.....

(1)

(ii) Suggest a hazard associated with ethanol.

.....

.....

(1)

(iii) Some cosmetic solutions have a small quantity of 'bitrex', a very bitter-tasting substance, added to them.

Suggest a reason for this.

.....

.....

(1)

(b) Outline a method for manufacturing ethanol.

Include raw materials and necessary reaction conditions.

.....

.....

.....

.....

.....

.....

.....

.....

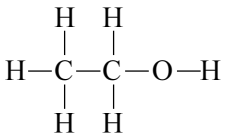
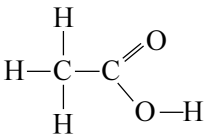
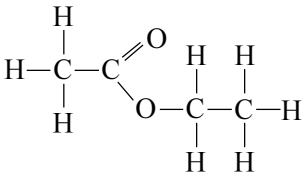
.....

(5)

Leave blank

(c) Ethyl ethanoate is formed by reacting ethanol with ethanoic acid.

(i) Draw lines to link the name of each compound to its correct structural formula.

ethanoic acid	●	● 
ethanol	●	● 
ethyl ethanoate	●	● 

(2)

(ii) Give **one** use of ethyl ethanoate.

.....

(1)

(Total 11 marks)

TURN OVER FOR QUESTION 8

Leave blank

8. (a) Impure iron from a blast furnace has few uses.

Pure iron also has few uses.

Explain why.

Impure iron has few uses because .....

.....

Pure iron has few uses because.....

.....

(2)

(b) Molten iron is made into steel as soon as it leaves the blast furnace.

Suggest why the conversion of the impure iron is carried out as soon as it leaves the blast furnace.

.....

.....

(1)

(c) Oxygen is blown through the molten iron during the steel making process to remove carbon present in the impure iron.

(i) What is formed when the carbon reacts?

.....

(1)

(ii) Suggest why the iron does not solidify when cold oxygen is blown through it.

.....

.....

.....

.....

(2)

(Total 6 marks)

TOTAL MARK 60

END

Centre Number						Paper Reference **1522/5H**		Surname	Other Names
Candidate Number						Paper Reference **1530/3H**		Signature	

For Examiner's use only

For Team Leader's use only

1522/5H 1530/3H

Edexcel GCSE

Science: Double Award A **[1522]**

Paper 5H

Chemistry A **[1530]**

Paper 3H

HIGHER TIER

Specimen Paper

Time: 1 hour 30 minutes **N0000**

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your signature, your surname and other names, then tick the box to show the correct paper reference for your examination.

The paper reference is shown below the boxes. If more than one paper reference is shown, you should tick the one for which you have been entered.

Answer ALL questions in the spaces provided in this book.

Show all stages in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This paper has 9 questions. There are no blank pages.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

Additional Answer Sheets may be used.

Turn over

Edexcel
Success through qualifications

THE PERIODIC TABLE

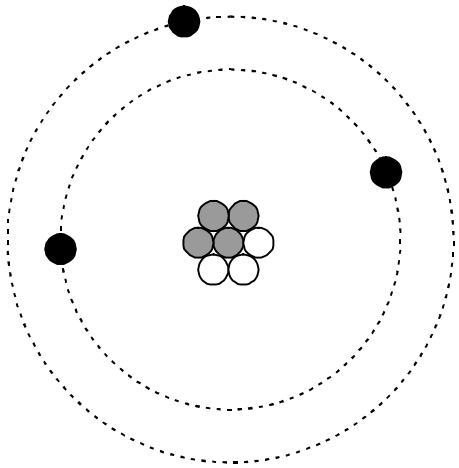
Period	1	2	Group									3	4	5	6	7	8
1	1 H Hydrogen 1																4 He Helium 2
2	7 Li Lithium 3	9 Be Berylium 4										11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
3	23 Na Sodium 11	24 Mg Magnesium 12										27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
4	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
5	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
6	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
7	223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key

Relative atomic mass
Symbol
Name
Atomic number

Leave blank

1. (a) The diagram shows the arrangement of particles in an atom of the element lithium.



Key

- particle **A**
- particle **B**
- particle **C**

(i) Identify the particles **A**, **B** and **C**.

Particle **A** .....

Particle **B** .....

Particle **C** .....

(3)

(ii) What is the mass number of the atom in the diagram?

.....

(1)

(iii) Use the diagram to explain why this element is in group 1 of the periodic table.

.....

.....

(1)

(b) Another element in group 1 is sodium.
Sodium reacts with chlorine (Cl_2) to form sodium chloride (NaCl).
Write a balanced equation for this reaction.

.....

(2)

(Total 7 marks)

TURN OVER FOR QUESTION 2

Leave blank

2. (a) Use the periodic table provided to give the electronic structure of a chlorine atom and a chloride ion.

chlorine atom	chloride ion

(4)

(b) Sodium chloride is an ionic compound containing sodium ions and chloride ions.

Explain why ionic compounds have high melting points.

.....

.....

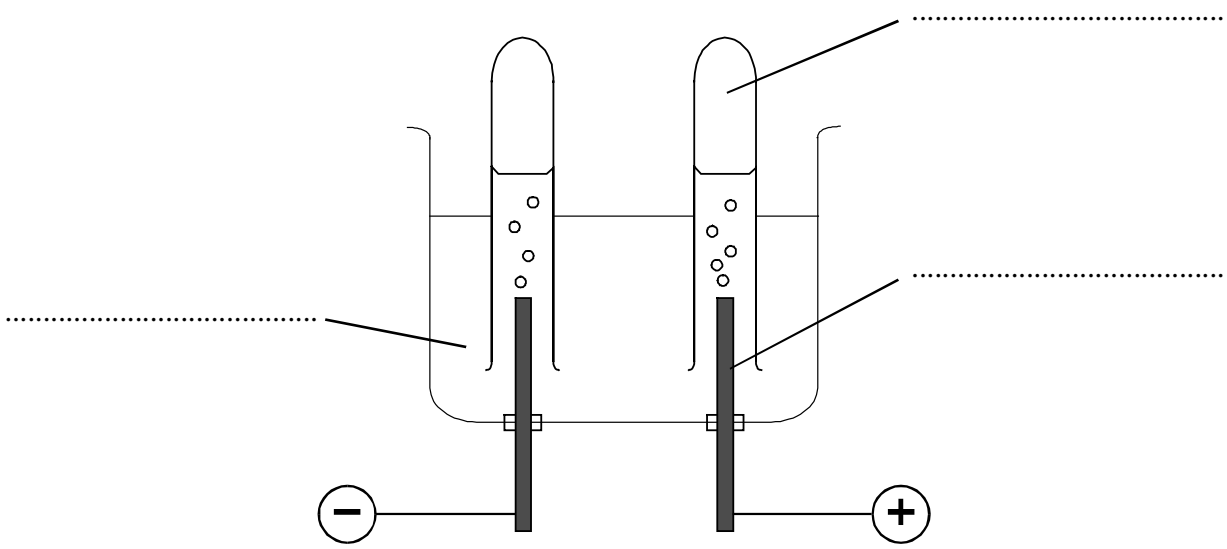
.....

.....

(2)

Leave blank

(c) When aqueous sodium chloride is electrolysed, hydrogen and chlorine gases are produced.
Label this diagram which shows the apparatus used to electrolyse aqueous sodium chloride.



(3)

(d) Describe a test for each of the gases formed.

Test for hydrogen .....

.....

.....

.....

Test for chlorine.....

.....

.....

.....

(4)

(e) In the industrial electrolysis of concentrated sodium chloride solution, three products are formed. Hydrogen and chlorine are two of the products.

Name the other product.

.....

(1)

(Total 14 marks)

Leave blank

3. The passage below is about the extraction of aluminium.

> Aluminium is the most common metallic element in the Earth's crust. In 1886, an inexpensive process for obtaining aluminium from its ores was invented by Charles Hall in the USA.
>
> As a 22 year old college student, Hall had become interested in the problem of producing aluminium. At that time, despite the abundance of aluminium compounds in nature, metallic aluminium was selling for about the same price as silver.
>
> Hall reasoned that aluminium oxide would be a good starting material from which to make aluminium. Some years later he said, 'The idea formed itself in my mind that if I could get a solution of aluminium oxide in something which contained no water, this would probably give a liquid from which aluminium could be obtained by electrolysis'.
>
> Working with home-made equipment, Hall made his first tiny globules of aluminium in a woodshed behind his parents' house. Within five years, the price of the metal had dropped to about a tenth of its former price.

(a) Suggest why silver is still expensive.

.....

(1)

(b) Hall's first reaction in February 1886 was done on a very small scale.

Give **one** piece of evidence from the passage to support this.

.....

(1)

(c) Large amounts of heat energy are taken in during the production of aluminium.

What word is used to describe this energy transfer?

A decomposition

B electrolysis

C endothermic

D exothermic

Write the correct answer (**A**, **B**, **C** or **D**) in the space provided.

.....

(1)

Leave blank

(d) Explain, using the passage and your knowledge of the reactivity series, why aluminium has only been used on a large scale since about 1890.

.....

.....

.....

.....

.....

.....

.....

.....

(4)

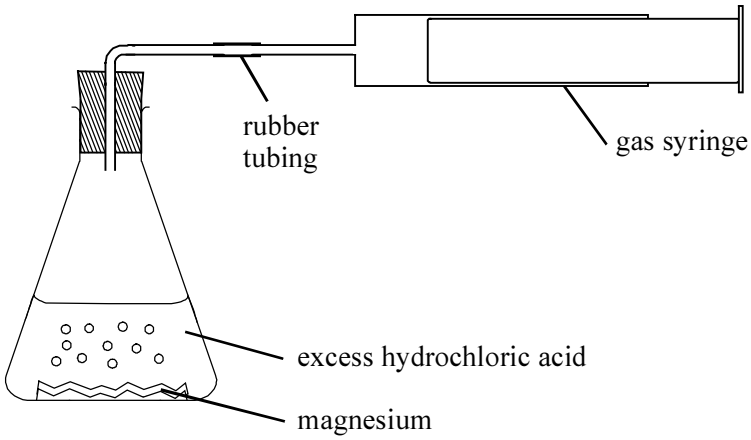
(Total 7 marks)

TURN OVER FOR QUESTION 4

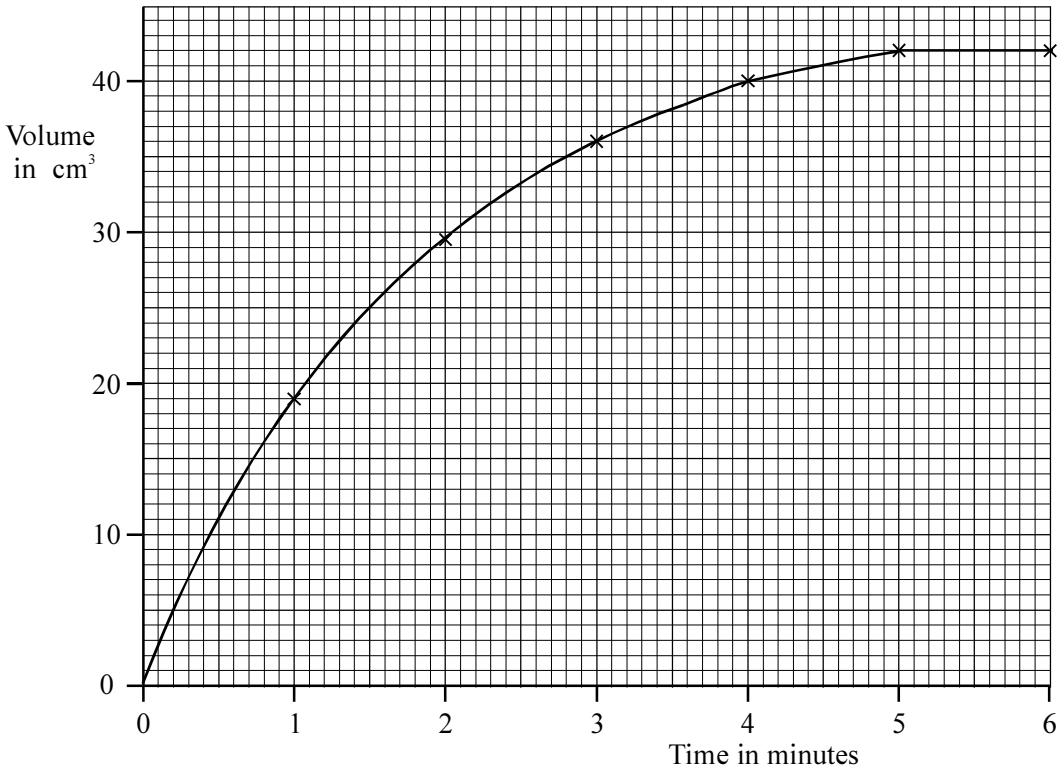
Leave blank

4. Magnesium ribbon reacts with hydrochloric acid to produce hydrogen.

A student used an excess of hydrochloric acid in the apparatus below to investigate this reaction.



His results are shown on the graph.



(a) What volume of gas was in the syringe at the end of the reaction?

.....

(1)

Leave blank

(b) State how the rate of reaction changes during the first **four** minutes and explain the change.

.....

.....

.....

.....

(2)

(c) The experiment was repeated using the same quantities of reagents but with the acid at a higher temperature.

Draw on the graph the line that should be obtained at this temperature.

(2)

(d) Some power stations burn coal in the production of electricity. The coal is ground to a fine powder before being burned in the furnace.

Use your knowledge of rates of reaction to suggest why the coal is ground to a fine powder rather than used in large lumps.

.....

.....

.....

.....

(2)

(Total 7 marks)

TURN OVER FOR QUESTION 5

Leave blank

5. Ammonia is made using the Haber process.

(a) The equation for the reversible reaction is:

$$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$$

What is the source of the nitrogen used in the Haber process?

.....

(1)

(b) The hydrogen used in the Haber process is obtained by heating methane with steam:

$$CH_4(g) + H_2O(g) \longrightarrow 3H_2(g) + CO(g)$$

What is the source of the methane gas for this reaction?

.....

(1)

(c) (i) Most of the ammonia produced is reacted with acids to form fertilisers.

Write a balanced equation for the reaction of ammonia with nitric acid.

.....

(3)

(ii) Why do most farmers add fertilisers to their crops?

.....

(1)

(iii) Excess fertiliser is washed off fields into rivers.

State **two** consequences of this.

1 .....

.....

2 .....

.....

(2)

(Total 8 marks)

Leave blank

6. Methanol is manufactured from carbon monoxide and hydrogen using similar conditions to those used in the manufacture of ammonia by the Haber process.

The equation for the manufacture of methanol is

$$CO(g) + 2H_2(g) \rightleftharpoons CH_3OH(g)$$

This reaction is exothermic.
The reaction conditions are a pressure of 200 atm and a temperature of 400 °C.

(a) State **two** advantages of using a pressure higher than 200 atm.

1 .....

2 .....

(2)

(b) (i) State **one** advantage of using a temperature lower than 400 °C.

Explain your answer.

.....

.....

.....

.....

.....

.....

(4)

(ii) State **one** disadvantage of using a temperature lower than 400 °C.

Explain your answer.

.....

.....

.....

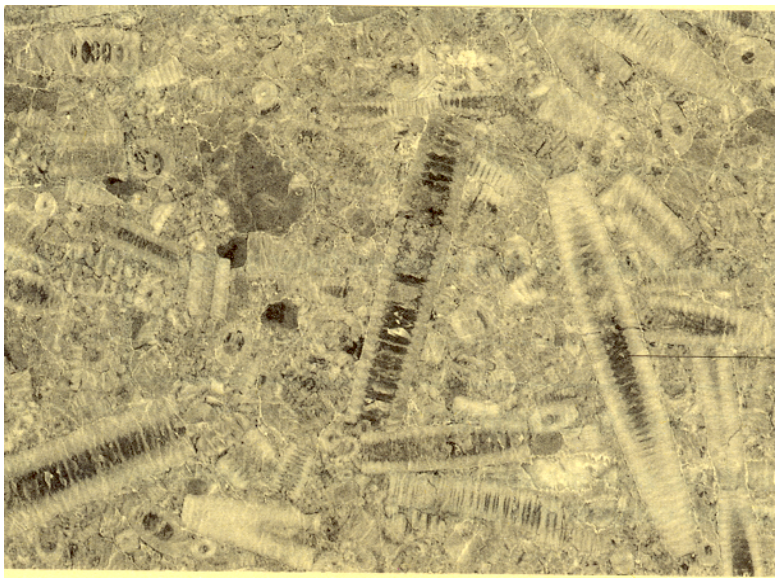
(2)

(Total 8 marks)

TURN OVER FOR QUESTION 7

Leave blank

7. Calcium carbonate occurs as the rock limestone. Limestone is often found in layers that contain fossils.



(a) Use the information above to explain how limestone was formed.

.....

.....

.....

.....

.....

.....

(4)

(b) Calcium carbonate also occurs as marble. Marble has been formed by subjecting limestone to heat and pressure.

What type of rock is marble?

.....

(1)

Leave blank

(c) When calcium carbonate is heated it decomposes.

$$CaCO_3 \longrightarrow CaO + CO_2$$

Calculate the mass of calcium oxide formed from 25 g of calcium carbonate.
(Relative atomic masses: Ca = 40; C = 12; O = 16)

.....

.....

.....

.....

(3)

(d) Bromine is reduced when it reacts with iodide ions.

$$Br_2(aq) + 2I^-(aq) \longrightarrow 2Br^-(aq) + I_2(aq)$$

(i) Name one compound containing I^- ions, which would be suitable for this reaction.

.....

(1)

(ii) State **one** change you would **see** as this reaction takes place.

.....

(1)

(iii) Explain why bromine is said to be reduced in this reaction.

.....

.....

(1)

(iv) Complete the half equation to show the iodide ions being oxidised.

$$\text{.....}I^- \longrightarrow I_2 + \text{.....}$$

(2)

(Total 13 marks)

TURN OVER FOR QUESTION 8

Leave blank

8. The table below gives information about the main fractions obtained from crude oil.

Fraction	Boiling range (°C)	Number of carbon atoms in each molecule
gas	-40 to 40	1 to 4
petrol	40 to 100	4 to 8
naphtha	100 to 160	6 to 10
kerosene	160 to 250	10 to 16
diesel oil	250 to 300	16 to 20
fuel oil	300 to 350	20 to 25

(a) State and explain the pattern shown between the boiling range of the fractions and the number of carbon atoms in each molecule.

.....

.....

.....

.....

(2)

(b) Fuel oil is cracked to form more useful products such as petrol and naphtha. Cracking produces a mixture of saturated and unsaturated hydrocarbons.

(i) Describe how cracking is carried out.

.....

.....

.....

.....

(2)

(ii) Describe a test for an unsaturated hydrocarbon.

.....

.....

.....

.....

(2)

Leave blank

(c) Propene (C_3H_6) can be obtained by cracking alkanes.

(i) Draw the structure of a molecule of propene showing **all** the bonds.

(2)

(ii) One molecule of the alkane decane ($C_{10}H_{22}$) was cracked to give two molecules of propene and one molecule of an alkane.

Write the balanced equation for this reaction.

.....

(2)

(d) Propene is used to make poly(propene).

(i) What feature of a propene molecule enables it to form poly(propene)?

.....

(1)

(ii) Draw the structure of the repeating unit in poly(propene).

(2)

(iii) Poly(ethene) is used to make many types of bottle.

Suggest why the more expensive poly(propene) is used to make bottles for fizzy drinks.

.....

.....

(1)

(Total 14 marks)

Leave blank

9. The table below shows some information about the isotopes of chlorine.

(a) Use information from the periodic table to help you complete the table.

Isotope	Mass Number	Abundance	Number of protons in one atom	Number of electrons in one atom	Number of neutrons in one atom
chlorine-35	35	75%	…….	……	……
chlorine-37	37	25%	…….	……	……

(3)

(b) (i) Show why the relative atomic mass of chlorine is given as 35.5.

.....

.....

.....

.....

(2)

(ii) What is the relative molecular mass of a chlorine molecule?

.....

(1)

(c) Draw a dot and cross diagram for a molecule of chlorine, showing outer electrons only.

(2)

Leave blank

(d) 18.39g of oxygen and 81.61g of chlorine are combined in 100g of a compound.

Calculate the empirical formula of the compound.

.....

.....

.....

.....

.....

.....

(4)

(Total 12 marks)

TOTAL MARK 90

END

Centre Number						Paper Reference		Surname	Other Names
						1530/4H			
Candidate Number								Signature	

For Examiner's use only

For Team Leader's use only

1530/4H

Edexcel GCSE

Chemistry A [**1530**]

Paper 4H

HIGHER TIER

Specimen Paper

Time: 1 hour **N0000**

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
Total	

Materials required for the examination
None

Items included with these question papers
None

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your signature, your surname and other names.

The paper reference is shown below the boxes.

Answer ALL questions in the spaces provided in this book.

Show all stages in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for the various parts of questions are shown in round brackets: e.g. (**2**).

This paper has 6 questions. There are no blank pages.

Advice to Candidates

This symbol shows where the quality of your written answer will also be assessed.

Additional Answer Sheets may be used.

Turn over

Edexcel
Success through qualifications

THE PERIODIC TABLE

Period	Group 1	2											3	4	5	6	7	8
1	1 H Hydrogen 1																	4 He Helium 2
2	7 Li Lithium 3	9 Be Berylium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
3	23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
4	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	63.5 Cu Copper 29	65.4 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
5	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
6	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
7	223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key

Relative atomic mass
Symbol
Name
Atomic number

Leave blank

1. (a) Complete the table which shows the tests for some ions in solution.

Name of ion in solution	Reagent added to the solution	Positive result
copper (II)	…… ……	light blue precipitate
……..	dilute nitric acid + silver nitrate solution	white precipitate
sulfate	……+ ……	…….. ……..

(5)

(b) Describe a test to show the presence of ammonium ions in ammonium chloride.

.....

.....

.....

.....

.....

.....

.....

.....

.....

(5)

(Total 10 marks)

TURN OVER FOR QUESTION 2

Leave blank

2. Ethanol is used as a solvent for perfumes and other cosmetics.

(a) (i) Suggest **one** advantage which ethanol has over water as a solvent in perfumes.

.....

.....

(1)

(ii) Suggest a hazard associated with ethanol.

.....

.....

(1)

(iii) Some cosmetic solutions have a small quantity of 'bitrex', a very bitter-tasting substance, added to them.

Suggest a reason for this.

.....

.....

(1)

(b) Outline a method for manufacturing ethanol.

Include raw materials and necessary reaction conditions.

.....

.....

.....

.....

.....

.....

.....

.....

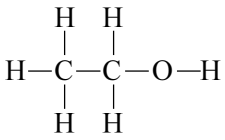
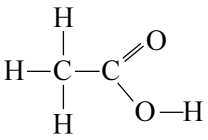
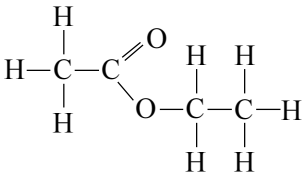
.....

(5)

Leave blank

(c) Ethyl ethanoate is formed by reacting ethanol with ethanoic acid.

(i) Draw lines to link the name of each compound to its correct structural formula.

ethanoic acid	●	● 
ethanol	●	● 
ethyl ethanoate	●	● 

(2)

(ii) Give **one** use of ethyl ethanoate.

.....

(1)

(Total 11 marks)

TURN OVER FOR QUESTION 3

Leave blank

BLANK PAGE

Leave blank

3. (a) Impure iron from a blast furnace has few uses.

Pure iron also has few uses.

Explain why.

Impure iron has few uses because .....

.....

Pure iron has few uses because.....

.....

(2)

(b) Molten iron is made into steel as soon as it leaves the blast furnace.

Suggest why the conversion of the impure iron is carried out as soon as it leaves the blast furnace.

.....

.....

(1)

(c) Oxygen is blown through the molten iron during the steel making process to remove carbon present in the impure iron.

(i) What is formed when the carbon reacts?

.....

(1)

(ii) Suggest why the iron does not solidify when the cold oxygen is blown through?

.....

.....

.....

.....

(2)

(Total 6 marks)

TURN OVER FOR QUESTION 4

Leave blank

4. Much of the sulfur dioxide required for the manufacture of sulfuric acid is obtained from roasting metal sulfide ores such as zinc sulfide in air. The equation for this reaction is

$$2ZnS + 3O_2 \longrightarrow 2ZnO + 2SO_2$$

(a) Calculate the maximum volume of sulfur dioxide, measured at room temperature and atmospheric pressure, which would be released when 48.5 kg of zinc sulfide is roasted.

(Relative atomic masses: Zn = 65, S = 32)
(1 mol of a gas occupies 24.0 dm^3 at room temperature and atmospheric pressure.)

.....

.....

.....

.....

.....

.....

.....

.....

(4)

(b) In the next stage of the process, the sulfur dioxide is converted into sulfur trioxide.

$$2SO_2 + O_2 \longrightarrow 2SO_3$$

(i) What volume of sulfur trioxide, measured under the same conditions, is obtained from 1000 dm^3 of sulfur dioxide?

.....

(1)

(ii) What volume of oxygen, measured under the same conditions, would be used?

.....

(1)

Leave blank

(iii) The conversion is carried out at atmospheric pressure and a temperature of 450 °C. The use of higher pressures and lower temperatures would give a greater yield of sulfur trioxide.

Explain why such conditions are not normally used.

Higher pressures

.....

.....

Lower temperatures

.....

.....

(2)

(Total 8 marks)

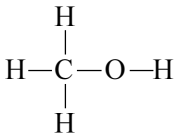
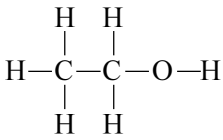
TURN OVER FOR QUESTION 5

Leave blank

5. The alcohols are an example of an homologous series.

(a) (i) The structures of the first two alcohols in the series are shown.

Complete the table to show the names and the structures of all the alcohols.

Name	Structure
……..	
Ethanol	
Propanol	
Butanol	

(3)

(ii) Why are these alcohols members of the same homologous series?

.....

.....

(1)

(iii) Describe a trend in a physical property of these alcohols.

.....

.....

.....

.....

(2)

Leave blank

(b) Compounds in the same homologous series undergo similar chemical reactions.

Describe one such reaction of the alcohols.
Write a balanced equation to show this reaction for one of the alcohols.

.....

.....

.....

.....

.....

.....

(4)

(Total 10 marks)

TURN OVER FOR QUESTION 6

Leave blank

6. Washing soda is hydrated sodium carbonate, $Na_2CO_3.xH_2O$. A student was asked to find the mass of sodium carbonate, Na_2CO_3, in a sample of washing soda. This mass was then used to find the formula of the hydrate.

Sodium carbonate solution is strongly alkaline.

The instructions for the experiment were as follows.

Part 1: Dissolve 28.6g of the hydrated salt in water and dilute the solution with distilled water to 1.00 dm^3.

Part 2: Measure out 25.0 cm^3 of this solution and titrate with the hydrochloric acid (HCl) provided, which has a concentration of 0.25 mol dm^{-3}, in the presence of methyl orange indicator. Methyl orange is red in acids and yellow in alkalis. The indicator changes colour at the end-point of the reaction shown by the equation

$$Na_2CO_3 + 2HCl \longrightarrow 2NaCl + H_2O + CO_2$$

(a) Describe in detail how the student should carry out Part 2 of this procedure. Include in your answer the apparatus which is used and the colour change at the end-point.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(7)

Leave blank

(b) The student found that 20.0 cm^3 of the hydrochloric acid was required in the titration. Use this figure to calculate the concentration of the sodium carbonate (Na_2CO_3) solution in mol dm^{-3} and hence the number of moles of sodium carbonate in 28.6g of the hydrate.

.....

.....

.....

.....

.....

.....

.....

.....

(4)

(c) Use the previous result to find the formula of the hydrated sodium carbonate.
You may use any method you wish but your working should be clear.

A suggested method is to begin by finding the mass of hydrated sodium carbonate which would contain 1 mol of anhydrous sodium carbonate, Na_2CO_3.

(Relative atomic masses: H = 1.00, C = 12.0, O = 16.0, Na = 23.0)

.....

.....

.....

.....

.....

.....

.....

(4)

(Total 15 marks)

TOTAL MARK 60

END

Syllabus 1530

Chemistry A

Specimen Paper 1F

MARK SCHEME

First Examination Summer 2003

Edexcel
Success through qualifications

USING THE MARK SCHEME

- This mark scheme gives you;* an idea of the type of response expected
  * how individual marks are to be awarded
  * the total mark for each question
  * examples of responses that should not receive credit.
- ; separates points for the award of each mark.
- / means that the responses are **alternatives** and either answer should receive full credit.
- ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
- Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
- OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
- 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
- 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
- ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
- ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

MARKING

- You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The mark awarded for part of a question should be written in the margin close to the sub-total.
- The sub-total marks for a question should be added together and the total mark written and ringed at the end of the question then transferred to the front of the script.
- Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
- **Do not** award marks for repetition of the stem of the question.
- Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

AMPLIFICATION

- In calculations, full credit must be given for a bald, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
- Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
- If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
- If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

QUALITY OF WRITTEN COMMUNICATION

This logo indicates where students will be assessed on their ability to:

- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use a suitable structure and style of writing.

1.	(a)	(i)	S;	1
		(ii)	lithium/potassium/rubidium/caesium/francium;	1
		(iii)	beryllium/magnesium/calcium/strontium/barium/radium;	1
		(iv)	oxygen/sulfur/selenium/tellurium/polonium;	1
		(v)	10;	1
		(vi)	lithium/beryllium/boron/carbon/nitrogen/oxygen/fluorine/neon;	1
	(b)		Any two non-metallic elements;;	2
				Total 8 marks
2.	(a)		H_2O; N_2; CO;	3
	(b)	(i)	volcanoes / volcanic activity;	1
		(ii)	Two from: • carbon monoxide; • water vapour; • carbon dioxide; • hydrogen;	2
		(iii)	oxygen;	1
	(c)		A description to include: • (bubble gas through) limewater; • which turns milky/cloudy;	2
	(d)	(i)	increases;	1
		(ii)	decreases;	1
				Total 11 marks
3.	(a)		A description to include three from: • fizzes/bubbles; • moves about; • floats on water; • white smoke; • burns with **yellow** flame; • dissolves/gets smaller; plus 1 communication mark for presenting relevant information in a form that suits its purpose;	4

	(b)		hydrogen;	1
	(c)		alkaline;	1
	(d)		increases;	1
				Total 7 marks
4.	(a)	(i)	55%;	1
		(ii)	good electrical conductor/ductile;	1
		(iii)	not corroded/malleable/not toxic;	1
	(b)	(i)	carbon;	1
		(ii)	CO_2; (g);	2
		(iii)	D;	1
				Total 7 marks
5.	(a)	(i)	hydrogen;	1
		(ii)	ethane;	1
		(iii)	hexane;	1
		(iv)	propane;	1
	(b)	(i)	points plotted correctly;; smooth curve;	3
		(ii)	value in range 32 to 38 °C;	1
	(c)	(i)	fractional; distillation;	2
		(ii)	Any two from: • petrol; • naphtha; • kerosine; • diesel (oil); • fuel oil;	2
	(d)		oxygen; water/steam/hydrogen oxide;	2
				Total 14 marks

6. (a) (i) Particle A - electron;
Particle B - neutron;
Particle C - proton; 3

(ii) 7; 1

(iii) one electron in outer shell; 1

(b) $2Na + Cl_2 \longrightarrow 2NaCl$
formulae correct;
balanced; 2

Total 7 marks

7. (a) atom: 2:8:7/equivalent diagram;;
ion: 2:8:8/equivalent diagram;;
in each case allow 1 mark for correct outer shell; 4

(b) An explanation to include:
- large amount of energy needed;
- to overcome strong forces/bonds between ions; 2

(c) 1. left - electrolyte/sodium chloride (solution);
2. top right - chlorine;
3. bottom right - anode/**positive** electrode; 3

(d) Test for hydrogen:
- lighted splint;
- gives 'pop';

Test for chlorine:
- (damp) litmus (paper);
- bleached; 4

(e) sodium hydroxide (solution); 1

Total 14 marks

8. (a) it is rare; 1

(b) home-made equipment/tiny globules/made in a woodshed; 1

(c) endothermic/C; 1

(d) An explanation to include three from:
- process not discovered until 1886;
- electricity needed/electrolysis uses electricity;
- electricity unavailable before this time;
- aluminium compounds are stable;

plus 1 communication mark for using a suitable structure and style of writing; 4

Total 7 marks

9. (a) 42 (cm^3); 1

(b) rate of reaction decreases;
as acid concentration falls/reactants or acid used up/ fewer collisions; 2

(c) line steeper than original;
but reaching same maximum volume; 2

(d) A suggestion to include:
- powder burns faster than lumps;
- because of greater surface area; 2

Total 7 marks

10. (a) air; 1

(b) natural/North Sea gas; 1

(c) (i) $NH_3 + HNO_3 \longrightarrow NH_4NO_3$
LHS formulae;
RHS formulae;
balanced; 3

(ii) to grow bigger/better crops; 1

(iii) increased plant life in rivers;
chokes rivers/eventually uses up oxygen in rivers; 2

Total 8 marks

TOTAL MARK 90

Syllabus 1530

Chemistry A

Specimen Paper 2F

MARK SCHEME

First Examination Summer 2003

Edexcel
Success through qualifications

USING THE MARK SCHEME

- This mark scheme gives you;* an idea of the type of response expected
  * how individual marks are to be awarded
  * the total mark for each question
  * examples of responses that should not receive credit.
- ; separates points for the award of each mark.
- / means that the responses are **alternatives** and either answer should receive full credit.
- ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
- Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
- OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
- 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
- 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
- ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
- ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

MARKING

- You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The mark awarded for part of a question should be written in the margin close to the sub-total.
- The sub-total marks for a question should be added together and the total mark written and ringed at the end of the question then transferred to the front of the script.
- Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
- **Do not** award marks for repetition of the stem of the question.
- Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

AMPLIFICATION

- In calculations, full credit must be given for a bald, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
- Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
- If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
- If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

QUALITY OF WRITTEN COMMUNICATION

This logo indicates where students will be assessed on their ability to:

- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use a suitable structure and style of writing.

1. (a) hydrogen; 1

(b) oxygen; 1

(c) ammonia; 1

(d) carbon dioxide; 1

(e) hydrogen chloride; 1

(f) argon 1

Total 6 marks

2. oxidation;
vinegar;
preserve; 3

Total 3 marks

3. (a) **Either** use safety glasses/wear apron/tie back hair;
or avoid contact with lead compounds/acid 1

(b) (i) C/sulfuric acid; 1

(ii) diagram of measuring cylinder/pipette/burette;
label; 2
[Allow 1 mark for beaker]

(c) top left: filter paper;
top right: lead sulfate/residue;
bottom left: filtrate/(nitric) acid;
bottom right: (filter) funnel; 4

Total 8 marks

4. (a) (i) Any two from:
- conducts electricity;
- lightweight/low density/light;
- does not corrode; 2

(ii) Any two from:
- lightweight/low density/light;
- strong;
- does not corrode;
- can be coloured; 2

(b) (i) protective layer;
can be coloured; 2

(ii) aluminium oxide; 1

(iii) aluminium/graphite/(named) unreactive metal; 1

(iv) (dilute) sulfuric acid; 1

Total 9 marks

5. (a) sulfur;
air;
sulfur dioxide;
sulfur dioxide;
sulfur trioxide; 5

(b) Any two from:
- making fertilisers;
- detergents;
- paints;
- plastics; 2

Total 7 marks

6. (a) sodium hydroxide (solution);
chloride;
barium chloride/nitrate (solution);
+ (dilute) hydrochloric/nitric acid;
white ppt; 5

(b) A description to include:
- add sodium hydroxide (solution);
- warm mixture;
- ammonia gas evolved;
- turns red litmus blue/
  forms white smoke with hydrogen chloride/
  has pungent smell;

plus 1 communication mark for ensuring that spelling, punctuation and grammar are accurate, so that the meaning is clear; 5

Total 10 marks

7. (a) (i) dissolves substances which are insoluble in water; 1

(ii) flammable; 1

(iii) to stop people drinking them; 1

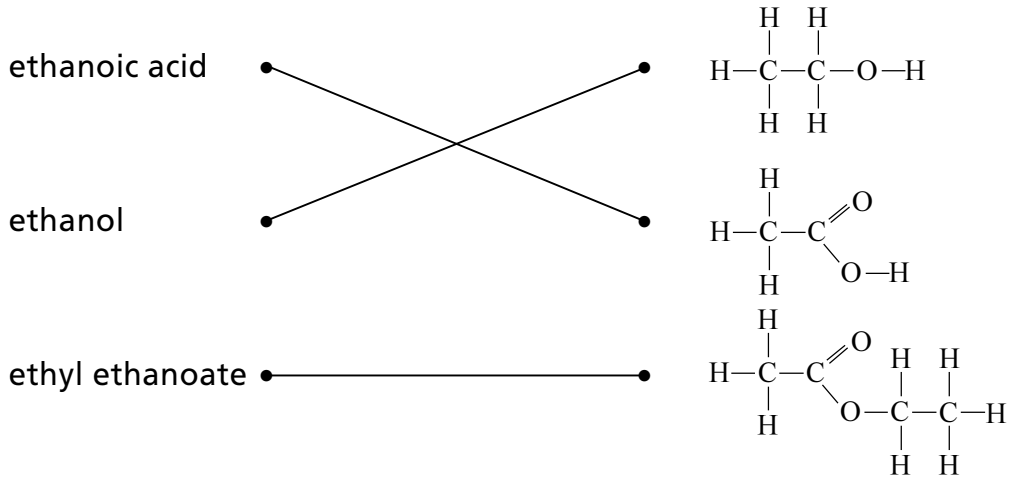
(b) An outline to include:

Either
- fermentation;
- glucose/sugar;
- yeast/warm temperature/absence of air;
- distill mixture to concentrate ethanol;

or
- hydration of ethene;
- ethene/steam;
- high temperature;
- catalyst;

plus 1 communication mark for presenting relevant information in a form that suits its purpose; 5

(c) (i)



2

(ii) solvent/flavouring; 1

Total 11 marks

8. (a) impure iron too brittle;
pure iron too soft; 2

(b) iron still molten/liquid; 1

(c) (i) carbon monoxide/dioxide; 1

(ii) A suggestion to include:
- exothermic reaction;
- provides enough heat to keep iron molten; 2

Total 6 marks

TOTAL MARK 60

Syllabus 1530

Chemistry A

Specimen Paper 3H

MARK SCHEME

First Examination Summer 2003

Edexcel
Success through qualifications

USING THE MARK SCHEME

- This mark scheme gives you;* an idea of the type of response expected
  * how individual marks are to be awarded
  * the total mark for each question
  * examples of responses that should not receive credit.
- ; separates points for the award of each mark.
- / means that the responses are **alternatives** and either answer should receive full credit.
- ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
- Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
- OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
- 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
- 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
- ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
- ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

MARKING

- You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The mark awarded for part of a question should be written in the margin close to the sub-total.
- The sub-total marks for a question should be added together and the total mark written and ringed at the end of the question then transferred to the front of the script.
- Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
- **Do not** award marks for repetition of the stem of the question.
- Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

AMPLIFICATION

- In calculations, full credit must be given for a bald, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
- Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
- If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
- If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

QUALITY OF WRITTEN COMMUNICATION

This logo indicates where students will be assessed on their ability to:

- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use a suitable structure and style of writing.

1. (a) (i) Particle A - electron;
Particle B - neutron;
Particle C - proton; 3

(ii) 7; 1

(iii) one electron in outer shell; 1

(b) $2Na + Cl_2 \longrightarrow 2NaCl$
formulae correct;
balanced; 2

Total 7 marks

2. (a) atom: 2:8:7/equivalent diagram;;
ion: 2:8:8/equivalent diagram;; 4
in each case allow 1 mark for correct outer shell;

(b) An explanation to include:
- large amount of energy needed;
- to overcome strong forces/bonds between ions; 2

(c) 1. left - electrolyte/sodium chloride (solution);
2. top right - chlorine;
3. bottom right - anode/**positive** electrode; 3

(d) Test for hydrogen:
- lighted splint;
- gives 'pop';

Test for chlorine:
- (damp) litmus (paper);
- bleached; 4

(e) sodium hydroxide (solution); 1

Total 14 marks

3. (a) it is rare; 1

(b) home-made equipment/tiny globules/made in a woodshed; 1

(c) endothermic/C; 1

(d) An explanation to include three from:
- process not discovered until 1886;
- electricity needed/electrolysis uses electricity;
- electricity unavailable before this time;
- aluminium compounds are stable;

plus 1 communication mark for using a suitable structure and style of writing; 4

Total 7 marks

4. (a) 42 (cm^3); 1

(b) rate of reaction decreases;
as acid concentration falls/reactants or acid used up;
fewer collisions; 2

(c) line steeper than original;
but reaching same maximum volume; 2

(d) A suggestion to include:
- powder burns faster than lumps;
- because of greater surface area; 2

Total 7 marks

5. (a) air; 1

(b) natural/North Sea gas; 1

(c) (i) $NH_3 + HNO_3 \longrightarrow NH_4NO_3$
LHS formulae;
RHS formulae;
balanced; 3

(ii) to grow bigger/better crops; 1

(iii) increased plant life in rivers;
chokes rivers/eventually uses up oxygen in rivers; 2

Total 8 marks

6. (a) greater yield of methanol;
faster reaction; 2

(b) (i) An explanation to include:
- greater yield of methanol;
- forward reaction/ formation of methanol is exothermic;
- lower temperature allows equilibrium to move in exothermic direction;

plus one communication mark for ensuring text is legible and that spelling, punctuation and grammar are accurate, so that the meaning is clear; 4

(ii) An explanation to include:
- molecules collide with less energy/less frequently;
- slower reaction; 2

Total 8 marks

7. (a) An explanation to include:
- marine organisms/crustaceans died;
- shells/skeletons built up in layers;
- compressed to form rock over time;

plus 1 communication mark for presenting relevant information in a form that suits its purpose; 4

(b) metamorphic; 1

(c) 100 g $CaCO_3$;
produces 40 g of CaO;
therefore 25 g $CaCO_3$ produces 10 g CaO; 3

(d) (i) any **soluble** metal iodide/hydrogen iodide; 1

(ii) red-brown colour produced; 1

(iii) gains electrons; 1

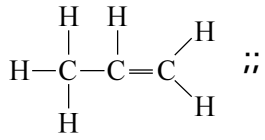
(iv) 2;
$2e^-$; 2

Total 13 marks

8. (a) An explanation to include:
- the more carbon atoms, the higher the boiling point;
- more energy needed to separate larger molecules; 2

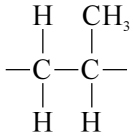
(b) (i) A description to include two from:
- high temperature;
- catalyst;
- absence of air; 2

(ii) A description to include:
- bromine (water);
- is decolourised; 2

(c) (i)  ;;
[Allow one mark for C=C] 2

(ii) $C_{10}H_{22} \longrightarrow 2C_3H_6 + C_4H_{10}$;; 2
[Allow one mark for $C_{10}H_{22} \longrightarrow C_3H_6 + C_7H_{16}$]

(d) (i) double bond; 1

(ii)  2

(iii) poly(propene) stronger; 1

Total 14 marks

9. (a)

17	17	18
17	17	20

each vertical pair; 3

(b) (i) $(0.75 \times 37) + (0.25 \times 35) = 35.5$;; 2

(ii) 71; 1

(c) correct diagram;; 2
[Allow one mark for one shared pair of electrons]

(d) O $\frac{18.39}{16} = 1.149$;
Cl $\frac{81.61}{35.5} = 2.299$;
ratio O:Cl 1:2;
empirical formula: OCl_2/Cl_2O; 4

Total 12 marks

TOTAL MARK 90

Syllabus 1530

Chemistry A

Specimen Paper 4H

MARK SCHEME

First Examination Summer 2003

Edexcel
Success through qualifications

USING THE MARK SCHEME

- This mark scheme gives you;* an idea of the type of response expected
  * how individual marks are to be awarded
  * the total mark for each question
  * examples of responses that should not receive credit.
- ; separates points for the award of each mark.
- / means that the responses are **alternatives** and either answer should receive full credit.
- ( ) means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
- Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
- OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
- 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
- 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
- ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
- ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

MARKING

- You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The mark awarded for part of a question should be written in the margin close to the sub-total.
- The sub-total marks for a question should be added together and the total mark written and ringed at the end of the question then transferred to the front of the script.
- Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
- **Do not** award marks for repetition of the stem of the question.
- Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

AMPLIFICATION

- In calculations, full credit must be given for a bald, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
- Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
- If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
- If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

QUALITY OF WRITTEN COMMUNICATION

This logo indicates where students will be assessed on their ability to:

- present relevant information in a form that suits its purpose
- ensure that spelling, punctuation and grammar are accurate, so that the meaning is clear
- use a suitable structure and style of writing.

1. (a) sodium hydroxide (solution);
chloride;
barium chloride/nitrate (solution);
+ (dilute) hydrochloric/nitric acid;
white ppt; 5

(b) A description to include:
- add sodium hydroxide (solution);
- warm mixture;
- ammonia gas evolved;
- turns red litmus blue/
  forms white smoke with hydrogen chloride/
  has pungent smell;

plus 1 communication mark for ensuring that spelling, punctuation and grammar are accurate, so that the meaning is clear; 5

Total 10 marks

2. (a) (i) dissolves substances which are insoluble in water; 1

(ii) flammable; 1

(iii) to stop people drinking them; 1

(b) An outline to include:

Either
- fermentation;
- glucose/sugar;
- yeast/warm temperature/absence of air;
- distill mixture to concentrate ethanol;

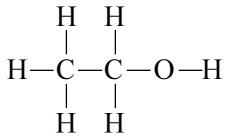
or
- hydration of ethene;
- ethene/steam;
- high temperature;
- catalyst;

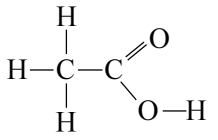
plus 1 communication mark for presenting information in a form that suits its purpose; 5

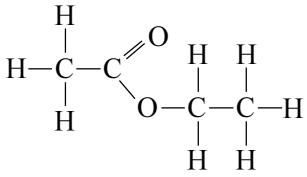
(c) (i) ethanoic acid

ethanol

ethyl ethanoate







2

(ii) solvent/flavouring; 1

Total 11 marks

3. (a) impure iron too brittle;
pure iron too soft; 2

(b) iron still molten/liquid; 1

(c) (i) carbon monoxide/dioxide; 1

(ii) A suggestion to include:
- exothermic reaction;
- provides enough heat to keep iron molten; 2

Total 6 marks

4. (a) I mol ZnS $\longrightarrow$ 1 mol SO_2;
ZnS = 97;
Mol ZnS = $\frac{48.5 \times 10^3}{97}$ = 500;
Vol of SO_2 $500 \times 24 = 12000$ dm^3; 4

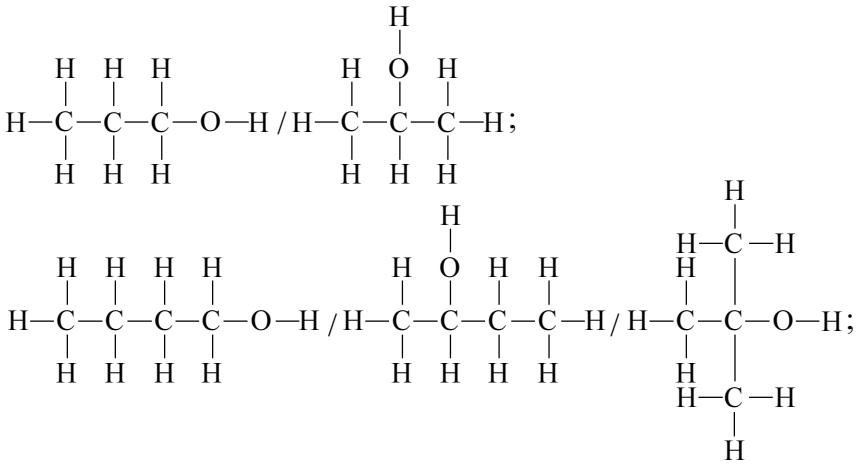
(b) (i) 1000 (dm^3)/same volume; 1

(ii) 500 (dm^3)/half volume; 1

(iii) Higher Pressures - expensive to maintain/safety risks;
Lower temperatures - slow; 2

Total 8 marks

5. (a) (i) methanol;



3

(ii) they all contain an O—H group/eq; 1

(iii) eg boiling point increases as number of carbon atoms increases;; 2

(b) eg they all react when heated with ethanoic acid;
to form sweet smelling;
esters;
$C_2H_5OH + CH_3COOH \longrightarrow CH_3CO.OC_2H_5 + H_2O$;; max 4

Total 10 marks

6. (a) A description to include:
- salt solution measured in pipette;
- add a few drops of indicator;
- add acid from burette;
- slowly/with swirling;
- dropwise at endpoint;
- colour change yellow;

plus 1 communication mark for using a suitable structure and style of writing; 7

(b)

moles acid used $\frac{20}{1000} \times 0.25 = 0.005$ mol HCl;

moles Na_2CO_3 $\frac{0.005}{2} = 0.0025$ mol;

moles Na_2CO_3 in 1 dm^3 $\frac{0.0025 \times 1000}{25}$;
= 0.1 mol Na_2CO_3; 4

(c) ecf from part (b)
1 mol in 286g;
1 mol (anhydrous) = 106;
mass of water present = 286 – 106 = 180 g
moles of water = $\frac{180}{18}$ = 10 mol;
x = 10; 4

Total 15 marks

TOTAL MARK 60

SPECIFICATION GRID *Specimen Paper*

GCSE CHEMISTRY A

Syll. No. 1530 Paper No. 1F Foundation Tier

Maximum mark for Paper 90 Page 1 of 2 **Date 7 November 2000**

YEAR of EXAM 2003

Q	Spec.Ref.	Assessment Objective				Total Mark	Level of demand		SocEET aspects	Short ans./ Object.	Equⁿ & Calcⁿ.	Extended Prose		
		AO1		AO2	AO3		Low	Stand.						
		K & U										= 2	> 2	Comm.
		51 – 62												
		Recall	Other	Applicⁿ	Inv.Sc.		G-E	D-C						
		17-21	34-41	28-39	0-5	90	45-54	36-45	✔	≤60	seeCQC	~18	~5	~3
1(a)	1.03/2.02/3.02		6				6			6				
(b)	3.01			2		8	2			2				
2(a)	2.02	2	1				3			3				
(b)	6.08/09/10	2	2				4			4				
(c)	4.16	2					2					2		
(d)	6.13		2			11	2			2				
3(a)	3.11	1	2	1			4						3	1
(b)	3.11	1					1			1				
(c)	3.12			1			1			1				
(d)	5.10		1			7	1			1				
4(a)	3.22		2	1			3		✔	2	1			
(b)	2.01/02/05/ 4.01	1	3			7	4			4				
5(a)	4.11/13/22		2	2			4			4				
(b)	4.13		3	1			3	1			4			
(c)	4.12/14	4					4		✔	4				
(d)	4.15		2			14	2			2				
6(a)	1.01/03/3.05		1	4				5		5				
(b)	2.04			2		7		2			2			
7(a)	1.04/09		4					4		4				
(b)	1.10	1	1					2				2		
(c)	3.13			3				3		3				
(d)	3.13	4						4	✔			4		
(e)	3.13		1			14		1		1				

SPECIFICATION GRID Specimen Paper

GCSE CHEMISTRY A

Syll. No. 1530 Paper No. 1F Foundation Tier

Maximum mark for Paper 90 Page 2 of 2 **Date 7 November 2000**

YEAR of EXAM 2003

Q	Spec.Ref.	Assessment Objective				Total Mark	Level of demand		SocEET aspects	Short ans./ Object.	Equⁿ & Calcⁿ.	Extended Prose		
		AO1		AO2	AO3		Low	Stand.				= 2	> 2	Comm.
		K & U												
		51 – 62												
		Recall	Other	Applicⁿ	Inv.Sc.		G-E	D-C						
		17-21	34-41	28-39	0-5	90	45-54	36-45	✔	≤60	seeCQC	~18	~5	~3
8(a)	4.03			1				1	✔	1				
(b)	4.06			1				1	✔	1				
(c)	5.11		1					1	✔	1				
(d)	4.04/05			4		7		4	✔				3	1
9(a)	5.03			1				1		1				
(b)	5.03/04		2					2				2		
(c)	5.04			2				2		2				
(d)	5.04/05			2		7		2	✔			2		
10(a)	6.01	1						1		1				
(b)	4.21	1						1		1	6			
(c)	6.04/05/06		3	3		8		6	✔	3	3			
	Total	20	39	31		90	46	44		58	10	14	6	2

SPECIFICATION GRID Specimen Paper

GCSE Chemistry A

Syll. No. 1530 Paper No. 2F Foundation Tier

Maximum mark for Paper 60 Page 1 of 1 **Date 7 November 2000**

YEAR of EXAM 2003

Q	Spec.Ref.	Assessment Objective				Total Mark	Level of demand		SocEET aspects	Short ans./ Object.	Equⁿ & Calcⁿ.	Extended Prose		
		AO1		AO2	AO3		Low	Stand.				= 2	> 2	Comm.
		K & U												
		34 – 41												
		Recall	Other	Applicⁿ	Inv.Sc.		G-E	D-C						
		11-14	22-27	19-26	0-3	60	30-36	24-30	✔	≤ 40	seeCQC	~12	~3	~2
1	7.08		6			6	6			6				
2	8.19/21	3				3	3			3				
3(a)	7.03		1				1			1				
(b)	7.04/06		1	2			3			3				
(c)	7.04			4		8	4			4				
4(a)	8.03			4			4			4				
(b)	8.01		5			9	5			5				
5(a)	8.09		5				5		✔	5				
(b)	8.11	2				7	2			2				
6(a)	7.11	5						5		5				
(b)	7.11	2		3		10		5					4	1
7(a)	8.18/16			3				3	✔	3				
(b)	8.12	2	2	1				5	✔				4	1
(c)	2.02/8.22/23	1	2			11		3	✔	3				
8(a)	8.05		2					2	✔			2		
(b)	8.06				1			1	✔	1				
(c)	8.06		1	2		6		3	✔	1		2		
	Total	12	28	19	1	60	33	27		46		4	8	2

SPECIFICATION GRID *Specimen Paper*

GCSE CHEMISTRY A

Syll. No. 1530 Paper No. 3H Higher Tier

Maximum mark for Paper 90 Page 1 of 2 **Date** 7 November 2000

YEAR of EXAM 2003

Q	Spec.Ref.	Assessment Objective				Total Mark	Level of demand		SocEET aspects	Short ans./ Object.	Equⁿ & Calcⁿ.	Extended Prose		
		AO1		AO2	AO3		Stand.	High						
		K & U										= 2	> 2	Comm.
		51 – 62												
		Recall	Other	Applicⁿ	Inv.Sc.		D-C	B-A*						
		17-21	34-41	28-39	0-5	90	36-45	45-54	✔	≤ 60	seeCQC	~14	~9	~3
1(a)	1.01/03/3.05		1	4			5			5				
(b)	2.04			2		7	2				2			
2(a)	1.04/09		4				4			4				
(b)	1.10	1	1				2					2		
(c)	3.13			3			3			3				
(d)	3.13	4					4		✔			4		
(e)	3.13		1			14	1			1				
3(a)	4.03			1			1		✔	1				
(b)	4.06			1			1		✔	1				
(c)	5.11		1				1			1				
(d)	4.04/05			4		7	4						3	1
4(a)	5.03			1			1			1				
(b)	5.03/04		2				2					2		
(c)	5.04			2			2			2				
(d)	5.04/05			2		7	2		✔			2		
5(a)	6.01	1					1			1				
(b)	4.21	1					1			1				
(c)	6.04/05/06		3	3		8	6		✔	3	3			
6(a)	6.02/03		2					2	✔	2				
(b)	6.02/03	2	1	3		8		6	✔			2	3	1
7(a)	6.16		3	1				4					3	1
(b)	6.18	1					1			1				
(c)	2.08			3				3			3			
(d)	2.06/3.18/4.02	1	2	2		13		5		3	2			

SPECIFICATION GRID Specimen Paper

GCSE CHEMISTRY A

Syll. No. 1530 Paper No. 3H Higher Tier

Maximum mark for Paper 90 Page 2 of 2 **Date 7 November 2000**

YEAR of EXAM 2003

Q	Spec.Ref.	Assessment Objective				Total Mark	Level of demand		SocEET aspects	Short ans./ Object.	Equⁿ & Calcⁿ.	Extended Prose		
		AO1		AO2	AO3		Stand.	High				= 2	> 2	Comm.
		K & U												
		51 – 62												
		Recall	Other	Applicⁿ	Inv.Sc.		D-C	B-A*						
		17-21	34-41	28-39	0-5	90	36-45	45-54	✔	≤ 60	seeCQC	~14	~9	~3
8(a)	4.13		1	1				2				2		
(b)	4.18/24	4						4	✔			4		
(c)	4.17/23	1	3					4		2	2			
(d)	4.26/27		3	1		14		4		4				
9(a)	1.01/03		2	1				3			3			
(b)	1.03/06/2.03		2	1				3			3			
(c)	1.12	2						2		2				
(d)	2.07		2	2		12		4			4			
	Total	18	34	38		90	44	46		38	22	18	9	3

SPECIFICATION GRID *Specimen Paper*

GCSE Chemistry A

Syll. No. 1530 Paper No. 4H Higher Tier

Maximum mark for Paper 60 Page 1 of 1

Date 7 November 2000

YEAR of EXAM 2003

Q	Spec.Ref.	Assessment Objective				Total Mark	Level of demand		SocEET aspects	Short ans./ Object.	Equⁿ & Calcⁿ.	Extended Prose		
		AO1		AO2	AO3		Stand.	High				= 2	> 2	Comm.
		K & U												
		34 – 41												
		Recall	Other	Applicⁿ	Inv.Sc.		C-D	B-A*						
		11-14	22-27	19-26	0-3	60	24-30	30-36	✔	≤ 40	seeCQC	~9	~6	~2
1(a)	7.11	5					5			5				
(b)	7.11	2		3		10	5						4	1
2(a)	8.18/16			3			3		✔	3				
(b)	8.12	2	2	1			5		✔				4	1
(c)	2.02/8.22/23	1	2			11	3		✔	3				
3(a)	8.05		2				2		✔			2		
(b)	8.06				1		1		✔	1				
(c)	8.06		1	2		6	3		✔	1		2		
4(a)	7.22/23		1	3				4	✔		4			
(b)	7.13/8.10		2	2		8		4		2	2			
5(a)	8.24/25/28	2	4					6		4		2		
(b)	8.29	1	2	1		10		4		1	3			
6	7.05/06/25		7	8		15		15			8		6	1
	Total	12	22	25	1	60	27	33		20	14	6	17	3

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481

Order Code UG 009328
Autumn 2000

For more information on Edexcel qualifications please contact our
Customer Response Centre on 0870 240 9800
or email: enquiries@edexcel.org.uk
or visit our website: www.edexcel.org.uk

Edexcel Foundation is a registered charity and a company limited
by guarantee. Registered in England No. 1686164

Edexcel
Success through qualifications