

Surname	Initial(s)
Signature	

Paper Reference(s)

5007 5035

Edexcel GCSE

Science (5007)

Chemistry (5035)

C1a – Topics 5 and 6

Foundation and Higher Tiers

Friday 6 March 2009 – Morning

Time: 20 minutes

Materials required for examination

Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers

Nil

Instructions to Candidates

Use an HB pencil. Do not open this booklet until you are told to do so.
Mark your answers on the separate answer sheet.

Foundation tier candidates: answer questions 1 – 24.

Higher tier candidates: answer questions 17 – 40.

All candidates are to answer questions 17 – 24.

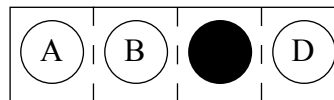
Before the test begins:

Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:

For each question, choose the right answer, A, B, C or D
and mark it in HB pencil on the answer sheet.

For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

Printer's Log. No.

N34837A



N 3 4 8 3 7 A

Turn over

W850/R1535/57570 4/4/2/51,315

This publication may be reproduced only in accordance with Edexcel Limited copyright policy. ©2009 Edexcel Limited.

edexcel 
advancing learning, changing lives

**Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.**

Group 1 elements

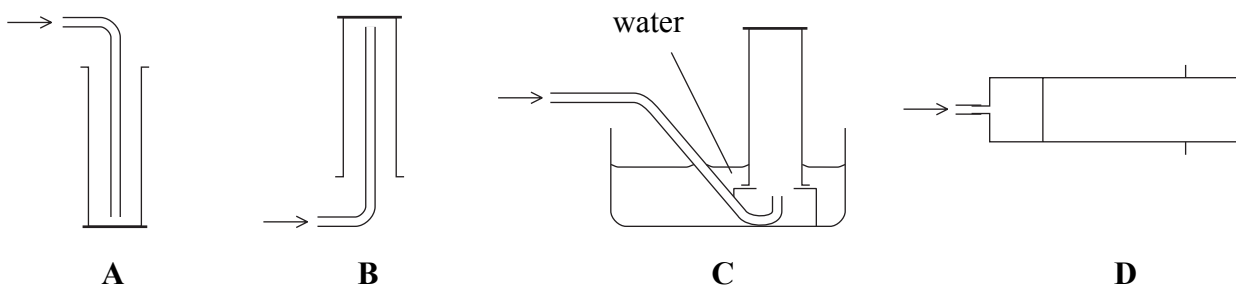
The table shows some information about three group 1 elements.

name	symbol of atom	relative speed of reaction with cold water
lithium	Li	slow
sodium	Na	
potassium		very fast

1. The symbol for an atom of potassium is
A K
B P
C Po
D Ko
2. The group 1 elements are also known as the
A halogens
B noble gases
C transition metals
D alkali metals
3. The relative speed of the reaction of sodium with cold water is
A very slow
B fast
C slow
D explosive
4. All of the elements in group 1
A have similar chemical properties
B are non-metals
C have identical physical properties
D only react with water

Carbon dioxide

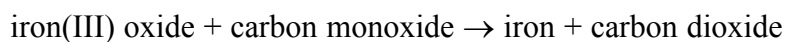
5. The formula of carbon dioxide is
- A CO^2
 - B CO
 - C CO_2
 - D Co_2
6. Carbon dioxide can be prepared by adding dilute hydrochloric acid to calcium carbonate. In this reaction the hydrochloric acid is
- A precipitated
 - B neutralised
 - C hydrated
 - D dehydrated
7. The test to prove that a gas is carbon dioxide is to bubble the gas through
- A limewater
 - B caustic soda
 - C water
 - D universal indicator
8. Carbon dioxide is denser than air and only slightly soluble in water. Which of these methods would **not** be suitable to collect a sample of carbon dioxide?



9. Carbon dioxide is used in fire extinguishers.
Which row of the table shows the properties of carbon dioxide that make it suitable for that use?

	carbon dioxide supports combustion	carbon dioxide prevents oxygen reaching the fire
A	no	no
B	no	yes
C	yes	no
D	yes	yes

10. Carbon dioxide and iron are obtained when iron(III) oxide is heated with carbon monoxide.
The word equation for this reaction is



This conversion of iron(III) oxide into iron is

- A** precipitation
 - B** combustion
 - C** neutralisation
 - D** reduction
11. Carbon monoxide can be used to convert iron(III) oxide into iron but is not used to convert aluminium oxide into aluminium.
This shows that aluminium
- A** has a greater density than iron
 - B** has the same reactivity as iron
 - C** is more reactive than iron
 - D** is an inert metal

Investigating solids

12. When baking powder is dissolved in water, the temperature of the solution decreases. This process is

A a precipitation
B endothermic
C a displacement
D exothermic

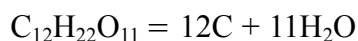
13. Baking powder is used in cooking. When any mixture of substances is cooked

A a physical change occurs
B the starting substances are not changed after cooking
C baking powder is always involved
D a chemical change occurs

14. In a flame test, one of the compounds in baking powder produced a yellow flame. This shows that baking powder contains a compound of

A potassium
B magnesium
C sodium
D calcium

15. Concentrated sulphuric acid was added to sugar, $C_{12}H_{22}O_{11}$. A black solid carbon, C, was formed.



This reaction is an example of

A combustion
B neutralisation
C dehydration
D oxidation

16. Sodium hydroxide solution is added to a solution of another solid, X. A blue precipitate is formed. This shows that X is a compound of

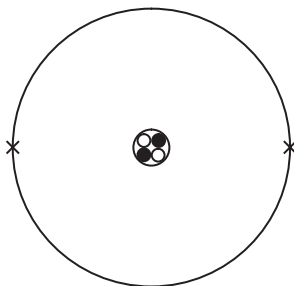
A iron
B zinc
C sodium
D copper

**Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.**

Non-metallic elements

Helium, hydrogen and neon are non-metallic elements.

The particles in an atom of helium are shown.



The atomic number of helium is 2.

17. Which statement correctly describes the particles in an atom of helium?

- A** there are 4 electrons present
- B** neutrons and protons are present in the nucleus
- C** protons are positively charged and electrons have no charge
- D** neutrons are negatively charged

18. Different atoms of helium

- A** must all contain 2 protons
- B** can contain different numbers of protons
- C** can have different atomic numbers
- D** can contain different numbers of electrons

19. The table shows information about helium, hydrogen and air.

	boiling point (°C)	density (g cm ⁻³)
helium	-269	0.00018
hydrogen	-253	0.00009
air	-194	0.00125

Use this information to choose which row of the table below shows the state of hydrogen and helium under room conditions and a possible use of these two elements?

	state of hydrogen and helium	possible use of hydrogen and helium
A	liquid	in fire extinguishers
B	gas	in fire extinguishers
C	liquid	in balloons
D	gas	in balloons

20. Helium and neon are in group 0 of the periodic table.
Which of these statements is correct?

- A** helium is unreactive and neon is reactive
- B** group 0 elements are more reactive than group 7 elements
- C** helium and neon are unreactive
- D** helium is reactive and neon is unreactive

Salts

Magnesium sulphate is a soluble salt.

Sulphuric acid is used to make magnesium sulphate by reacting it with magnesium oxide.

21. To produce pure magnesium sulphate by this method, all of the sulphuric acid must be reacted.
To react all of the sulphuric acid it is necessary to use
- A excess magnesium oxide
 - B dilute sulphuric acid
 - C heat
 - D concentrated sulphuric acid
22. This reaction used to make magnesium sulphate is an example of
- A dehydration
 - B precipitation
 - C neutralisation
 - D hydration
23. Lead sulphate is an insoluble salt.
Lead sulphate is prepared in a reaction that forms the salt as a precipitate.
A suitable method of preparing the salt as a precipitate would be to
- A add excess lead oxide to dilute sulphuric acid
 - B add excess lead to dilute sulphuric acid
 - C mix solutions of sodium sulphate and lead nitrate
 - D add excess lead carbonate to dilute sulphuric acid
24. The lead sulphate precipitate is formed mixed in a solution.
A pure, dry sample of the insoluble lead sulphate can be obtained from this mixture by
- A filtering, evaporating and drying
 - B crystallisation
 - C filtering, washing and drying
 - D evaporating and drying

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

**Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.**

Group 7 elements – the halogens

The halogens are reactive elements.

The table shows some information about the first three group 7 elements.

halogen	atomic number	appearance at room conditions
fluorine		yellow gas
chlorine	17	green-yellow gas
bromine	35	

25. Which of these correctly completes the table?

	atomic number	appearance
A	9	green gas
B	9	red liquid
C	26	green gas
D	26	red liquid

26. Halogens can react with solutions of other halides.
Which of these pairs will react?

- A** chlorine and potassium bromide solution
- B** bromine and potassium fluoride solution
- C** chlorine and potassium fluoride solution
- D** bromine and potassium chloride solution

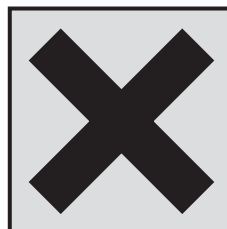
27. Which row of the table shows the test for chlorine?

	test with	result
A	a lighted splint	extinguished
B	moist litmus paper	turns white
C	a glowing splint	extinguished
D	moist litmus paper	turns blue

28. A cylinder of chlorine gas is labelled with these two hazard symbols.



symbol 1



symbol 2

Which row of the table is correct?

	symbol 1 shows that chlorine is	symbol 2 shows that chlorine is
A	irritating	corrosive
B	corrosive	harmful
C	poisonous	harmful
D	irritating	poisonous

Food chemistry

Three causes of concern with regard to food safety are

- additives
- preservatives
- pesticides

29. It is suspected that a solid food additive may be contaminated with a copper compound. Which row of the table shows a test on the solid and a test on its solution that can be used to show that it contains a copper compound?

	test on solid	test on solution of solid
A	lighted splint	add dilute sulphuric acid
B	flame test	add dilute sulphuric acid
C	lighted splint	add sodium hydroxide solution
D	flame test	add sodium hydroxide solution

30. Sodium ethanoate is used to flavour some foods.
Which of these substances could not be used to prepare sodium ethanoate from dilute ethanoic acid?
- A sodium oxide
 - B sodium nitrate
 - C sodium carbonate
 - D sodium hydroxide

Use the following information to answer questions 31 and 32.

Baking powder contains sodium hydrogencarbonate.

31. Baking powder is often part of cake mixtures and reacts during the cooking process to produce a gas.

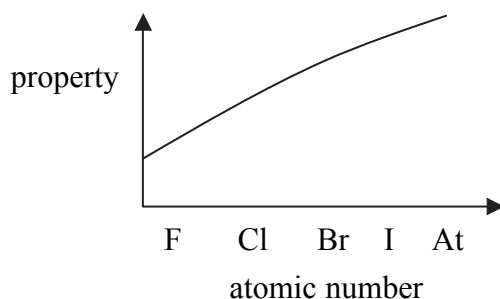
Which row of the table shows the type of substance that reacts with the sodium hydrogencarbonate and the name of the gas produced?

	type of substance reacting with sodium hydrogencarbonate	gas produced
A	an acid	oxygen
B	an alkali	carbon dioxide
C	an acid	carbon dioxide
D	an alkali	oxygen

32. Which equation shows the thermal decomposition of sodium hydrogencarbonate?

- A $\text{Na}_2\text{CO}_3 \rightarrow \text{Na}_2\text{O} + \text{CO}_2$
- B $2\text{NaHCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \text{CO}_2$
- C $2\text{NaHCO}_3 \rightarrow \text{Na}_2\text{O} + \text{H}_2\text{O} + 2\text{CO}_2$
- D $\text{Na}_2\text{CO}_3 + \text{H}_2\text{O} + \text{CO}_2 \rightarrow 2\text{NaHCO}_3$

34. The diagram shows the trend in a property of the elements from fluorine, F, to astatine, At, with increasing atomic number.



The property could be

- A the number of atoms in one molecule of the halogen
 - B boiling point
 - C number of electrons in the outer shell
 - D reactivity
35. The table shows the atomic numbers and relative atomic masses of tellurium, Te, and iodine, I.

element	atomic number	relative atomic mass
tellurium	52	127.6
iodine	53	126.9

Which of these statements is correct?

- A a tellurium atom contains more protons than an iodine atom
 - B an atom of tellurium has the same number of electrons as an atom of iodine
 - C tellurium and iodine have different chemical properties
 - D tellurium and iodine are arranged in the periodic table in order of increasing relative atomic mass
36. A compound of selenium, Se, has the formula, Na_2SeO_4 .
The most likely name of this compound is
- A sodium selenium oxide
 - B sodium selenide
 - C sodium selenate
 - D sodium oxyselenide

Lead

Lead is obtained from the ore galena.

Galena is heated strongly to form lead oxide.

Lead can be extracted by heating a mixture of lead oxide and carbon.

The carbon reacts to form carbon monoxide and this reacts with the lead oxide to form lead.

37. Which is the correct equation for the reaction of lead oxide with carbon monoxide?

- A** $\text{PbO} + \text{CO} \rightarrow \text{C} + \text{PbO}_2$
B $2\text{PbO} + 3\text{CO} \rightarrow 3\text{CO}_2 + 2\text{Pb}$
C $\text{PbO} + \text{CO} \rightarrow \text{CO}_2 + \text{Pb}$
D $2\text{PbO} + \text{CO} \rightarrow \text{CO}_2 + 2\text{Pb}$

38. Which row of the table describes the types of changes which the original carbon, the carbon monoxide and the lead oxide undergo in this reaction?

	carbon is	carbon monoxide is	lead oxide is
A	reduced	reduced	oxidised
B	oxidised	reduced	oxidised
C	reduced	oxidised	reduced
D	oxidised	oxidised	reduced

39. Sodium is more reactive than lead.

Here are three methods used to extract metals from their ores.

- 1 reduction with carbon
- 2 reaction with carbon monoxide
- 3 electrolysis

Which of these methods can be used to extract sodium from its ore?

- A** 1 only
B 2 only
C 3 only
D none of these

40. Titanium is extracted by reacting titanium(IV) chloride with sodium.
Titanium cannot be extracted by heating titanium(IV) oxide with carbon.
Gold is found uncombined in the Earth's crust.
The order of reactivity of titanium, gold, and lead is

	most reactive		least reactive
A	lead	titanium	gold
B	titanium	lead	gold
C	titanium	gold	lead
D	gold	lead	titanium

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END

BLANK PAGE