



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

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CHEMISTRY

0620/11

Paper 1 Multiple Choice

October/November 2014

45 Minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)



READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, glue or correction fluid.

Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

DO NOT WRITE IN ANY BARCODES.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

A copy of the Periodic Table is printed on page 16.

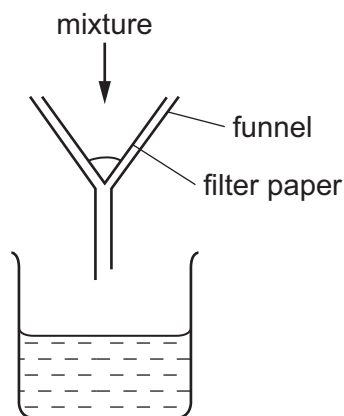
Electronic calculators may be used.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **13** printed pages and **3** blank pages.



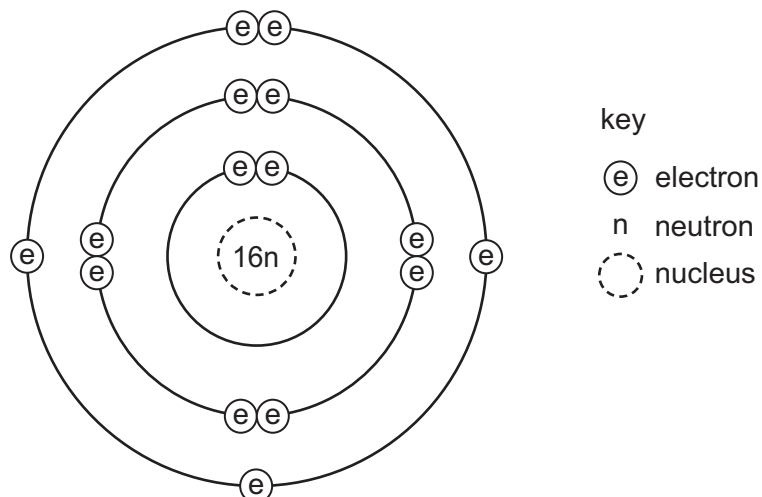
- 1 Which statement is an example of diffusion?
- A A kitchen towel soaks up some spilt milk.
 - B Ice cream melts in a warm room.
 - C Pollen from flowers is blown by the wind.
 - D The smell of cooking spreads through a house.
- 2 A mixture is separated using the apparatus shown.



What is the mixture?

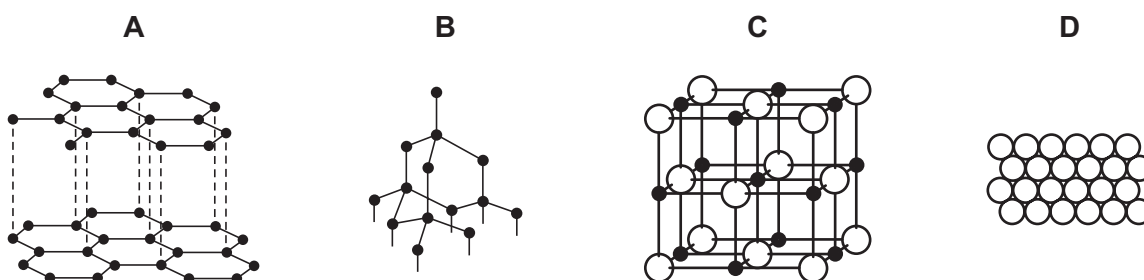
- A aqueous copper chloride and copper
 - B aqueous copper chloride and sodium chloride
 - C ethane and methane
 - D ethanol and water
- 3 Ethanol is made by fermentation.
- How is ethanol obtained from the fermentation mixture?
- A chromatography
 - B crystallisation
 - C electrolysis
 - D fractional distillation
- 4 What is different for isotopes of the same element?
- A nucleon number
 - B number of electron shells
 - C number of electrons in the outer shell
 - D proton number

- 5 Which element has the atomic structure shown?



- A Al B P C S D Si

- 6 Slate has a layered structure and can easily be split into thin sheets.
Which diagram shows a structure most like that of slate?



- 7 Sodium chloride is an ionic solid.

Which statement is **not** correct?

- A Ions are formed when atoms lose or gain electrons.
B Ions in sodium chloride are strongly held together.
C Ions with the same charge attract each other.
D Sodium chloride solution can conduct electricity.

- 8 Caesium chloride and rubidium bromide are halide compounds of Group I elements.

Caesium chloride has the formula1....., a relative formula mass2..... that of rubidium bromide and bonds that are3..... .

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	CaCl	different from	ionic
B	CaCl	the same as	covalent
C	CsCl	different from	ionic
D	CsCl	the same as	covalent

- 9 How many atoms of hydrogen are there in a molecule of ethanol, $\text{C}_2\text{H}_5\text{OH}$?

A 1 **B** 2 **C** 5 **D** 6

- 10 Iron forms an oxide with the formula Fe_2O_3 .

What is the relative formula mass of this compound?

A 76 **B** 100 **C** 136 **D** 160

- 11 Which metal could **not** be used for electroplating by using an aqueous solution?

A chromium
B copper
C silver
D sodium

- 12 Which products are formed at the electrodes when a concentrated solution of sodium chloride is electrolysed?

	cathode (–)	anode (+)
A	hydrogen	chlorine
B	hydrogen	oxygen
C	sodium	chlorine
D	sodium	oxygen

13 Which statements about exothermic and endothermic reactions are correct?

- 1 During an exothermic reaction, heat is given out.
- 2 The temperature of an endothermic reaction goes up because heat is taken in.
- 3 Burning methane in the air is an exothermic reaction.

A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

14 A power station was designed to burn gaseous fuels only.

Which two substances could be used?

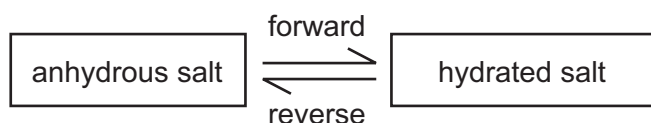
- A carbon dioxide and hydrogen
B carbon dioxide and ^{235}U
C hydrogen and methane
D methane and ^{235}U

15 The rate of a reaction depends on temperature, concentration, particle size and catalysts.

Which statement is **not** correct?

- A Catalysts can be used to increase the rate of reaction.
B Higher concentration decreases the rate of reaction.
C Higher temperature increases the rate of reaction.
D Larger particle size decreases the rate of reaction.

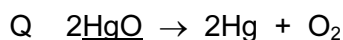
16 The diagram shows the change from an anhydrous salt to its hydrated form.



Which statement is correct?

- A forward reaction requires heat and water
B forward reaction requires water only
C reverse reaction requires heat and water
D reverse reaction requires water only

P $2\text{NaNO}_2 + \text{O}_2 \rightarrow 2\text{NaNO}_3$



	P	Q
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

- 1 heating the magnesium to a higher temperature
- 2 using a higher proportion of oxygen in the air
- 3 using magnesium ribbon instead of powdered magnesium

19 Which substance is the most acidic?

	substance	pH
A	calcium hydroxide	12
B	lemon juice	4
C	milk	6
D	washing up liquid	8

A simplified periodic table diagram with the following structure:

- Row 1: A single box labeled 'W'.
- Row 2: A single box labeled 'X'.
- Row 3: A row of 10 boxes. The 8th box from the left is labeled 'Y'.
- Row 4: A row of 10 boxes. The 7th box from the left is labeled 'Z'.

There are also two empty boxes above the main structure: one centered above the 5th box of Row 3, and another at the far right, above the 10th box of Row 4.

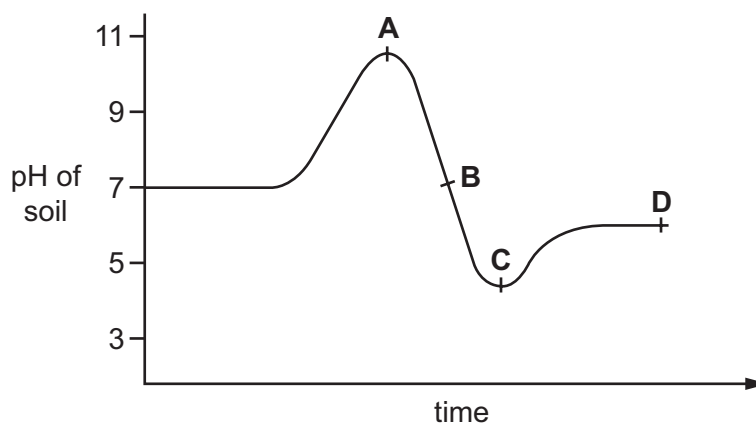
A W, X and Y **B** W and X only **C** Y only **D** Z only

21 How many different salts could be made from a supply of dilute sulfuric acid, dilute hydrochloric acid, copper, magnesium oxide and zinc carbonate?

- A 3 B 4 C 5 D 6

22 The graph shows how the pH of soil in a field changes over time.

At which point was the soil neutral?



23 Elements in Group I of the Periodic Table react with water.

Which row describes the products made in the reaction and the trend in reactivity of the elements?

	products	trend in reactivity
A	metal hydroxide and hydrogen	less reactive down the group
B	metal hydroxide and hydrogen	more reactive down the group
C	metal oxide and hydrogen	less reactive down the group
D	metal oxide and hydrogen	more reactive down the group

24 An element X has the two properties listed.

- 1 It acts as a catalyst.
- 2 It forms colourless ions.

Which of these properties suggest that X is a transition element?

	property 1	property 2
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

25 An inert gas X is used to fill weather balloons.

Which descriptions of X are correct?

	number of outer electrons in atoms of X	structure of gas X
A	2	single atoms
B	2	diatomic molecules
C	8	single atoms
D	8	diatomic molecules

26 The table shows the reactions of four different metals with water.

metal	reaction
W	reacts vigorously with cold water
X	no reaction with water
Y	reacts very slowly with water, more vigorously with steam
Z	reacts violently with cold water

What is the correct order of reactivity, from most reactive to least reactive?

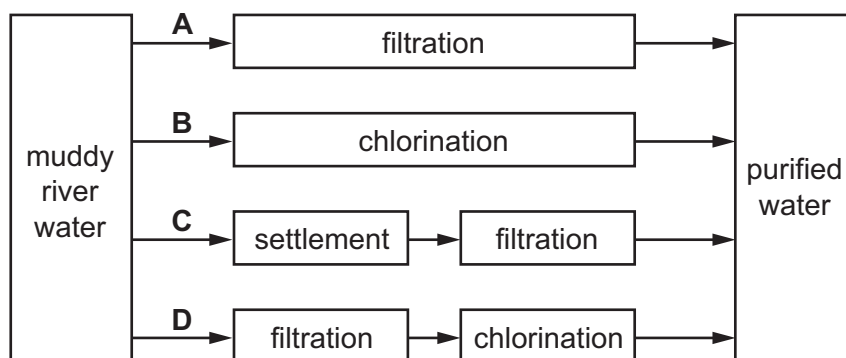
- A** $W \rightarrow X \rightarrow Y \rightarrow Z$
- B** $W \rightarrow Z \rightarrow Y \rightarrow X$
- C** $Z \rightarrow W \rightarrow X \rightarrow Y$
- D** $Z \rightarrow W \rightarrow Y \rightarrow X$

- 27 Which information about an element can be used to predict its chemical properties?
- A boiling point
 - B density
 - C melting point
 - D position in the Periodic Table
- 28 Aluminium is the most common metal in the Earth's crust.
- Which is **not** a property of aluminium?
- A low density
 - B resistance to corrosion
 - C good conductor of electricity
 - D poor conductor of heat
- 29 The oxide of element X is reduced by heating with carbon.
- Element X does not react with cold water, steam or dilute hydrochloric acid.
- What is X?
- A copper
 - B iron
 - C magnesium
 - D zinc
- 30 Which object is **least** likely to contain aluminium?
- A a bicycle frame
 - B a hammer
 - C a saucepan
 - D an aeroplane body
- 31 Which reaction involves oxidation?
- A heating hydrated copper(II) sulfate in the air
 - B polymerisation of ethene
 - C rusting of iron
 - D thermal decomposition of calcium carbonate

32 Which method can be used to obtain ammonia from ammonium sulfate?

- A Heat it with an acid.
- B Heat it with an alkali.
- C Heat it with an oxidising agent.
- D Heat it with a reducing agent.

33 Which method of purification would produce water **most** suitable for drinking?



34 Which statement about methane is **not** correct?

- A It is a liquid produced by distilling petroleum.
- B It is produced as vegetation decomposes.
- C It is produced by animals, such as cows.
- D It is used as a fuel.

35 Which is an air pollutant that affects a part of the body other than the lungs and blood system?

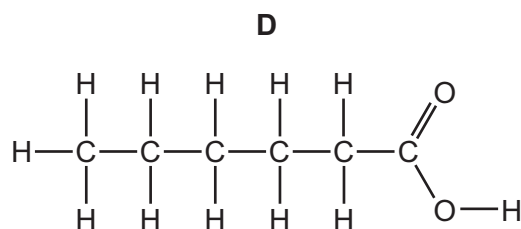
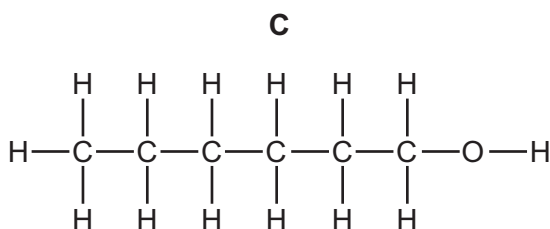
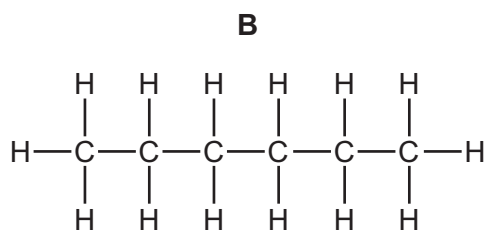
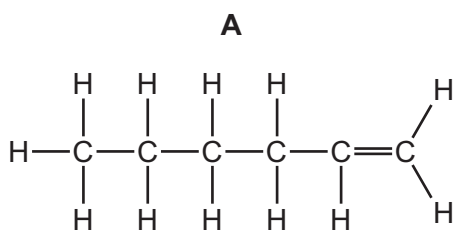
- A lead compounds
- B nitrogen
- C oxides of nitrogen
- D sulfur dioxide

- 36 Increasing the number of atoms in one molecule of a hydrocarbon increases the energy released when it burns.

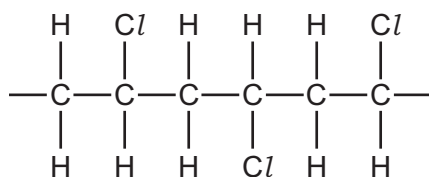
What is the correct order?

	less energy released	→	more energy released
A	ethene	ethane	methane
B	ethene	methane	ethane
C	methane	ethane	ethene
D	methane	ethene	ethane

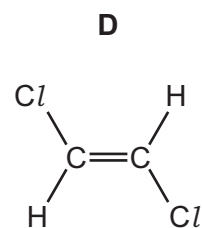
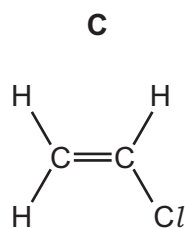
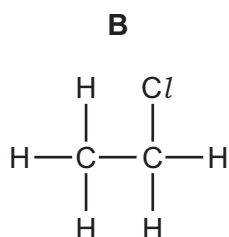
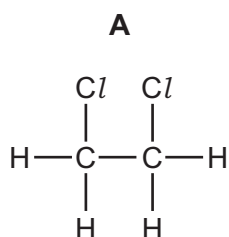
- 37 Which molecular structure shows hexene?



- 38 The diagram shows three repeat units in the structure of an addition polymer.



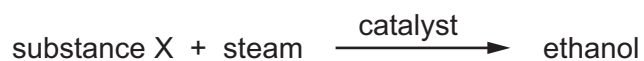
Which alkene monomer is used to make this polymer?



39 Which statement about alkenes is **not** correct?

- A The functional group is C=C.
- B The structural difference between one member and the next is $-\text{CH}_3-$.
- C They form a homologous series.
- D They turn aqueous bromine from brown to colourless.

40 Ethanol can be manufactured from substance X.



What is substance X?

- A carbon dioxide
- B ethene
- C hydrogen
- D oxygen

DATA SHEET
The Periodic Table of the Elements

Group																							
I	II											III	IV	V	VI	VII	0						
												1 H Hydrogen 1											
7 Li Lithium 3	9 Be Beryllium 4																						
23 Na Sodium 11	24 Mg Magnesium 12																						
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	64 Cu Copper 29	65 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						
85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	101 Ru Ruthenium 44	101 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	127 Te Tellurium 52	131 I Iodine 53	136 Xe Xenon 54	136 Kr Krypton 36						
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						
Fr Francium 87	Ra Radium 88	Ac Actinium 89																					
58-71 Lanthanoid series																							
90-103 Actinoid series																							
175 Lu Lutetium 71																							
173 Yb Ytterbium 70																							
169 Tm Thulium 69																							
167 Er Erbium 68																							
165 Ho Holmium 67																							
162 Dy Dysprosium 66																							
159 Tb Terbium 65																							
157 Gd Gadolinium 64																							
152 Eu Europium 63																							
150 Sm Samarium 62																							
144 Nd Neodymium 60																							
141 Pr Praseodymium 59																							
140 Ce Cerium 58																							
238 U Uranium 92																							
238 Pa Protactinium 91																							
232 Th Thorium 90																							
232 Np Neptunium 93																							
238 Pu Plutonium 94																							
238 Am Americium 95																							
238 Cm Curium 96																							
238 Bk Berkelium 97																							
238 Cf Californium 98																							
238 Es Einsteinium 99																							
238 Fm Fermium 100																							
238 Md Mendelevium 101																							
238 No Nobelium 102																							
238 Lr Lawrencium 103																							
238 X a = relative atomic mass b = proton (atomic) number X = atomic symbol																							

*58-71 Lanthanoid series
†90-103 Actinoid series

a	X	a = relative atomic mass
b	X	X = atomic symbol
		b = proton (atomic) number

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).