



Cambridge
IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CHEMISTRY

0620/12

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)

* 7 9 5 2 5 9 0 1 5 2 *



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 Ethanol is made by fermentation.

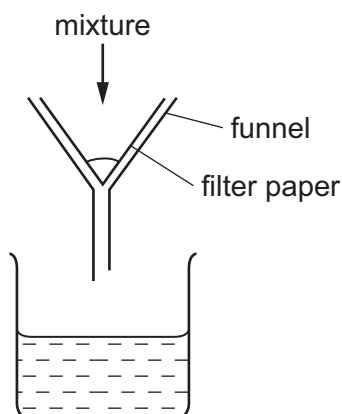
How is ethanol obtained from the fermentation mixture?

- A chromatography
- B crystallisation
- C electrolysis
- D fractional distillation

2 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.

3 A mixture is separated using the apparatus shown.

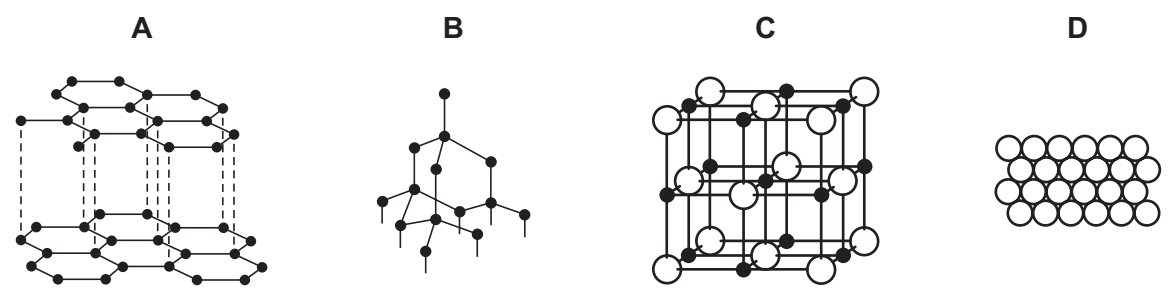


What is the mixture?

- A aqueous copper chloride and copper
 - B aqueous copper chloride and sodium chloride
 - C ethane and methane
 - D ethanol and water
- 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 Slate has a layered structure and can easily be split into thin sheets.

Which diagram shows a structure most like that of slate?



6 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.

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

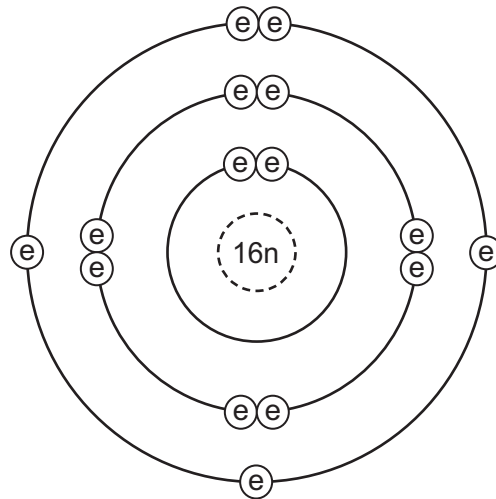
Caesium chloride has the formula1....., a relative formula mass2..... that of rubidium bromide and bonds that are3..... .

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

4

8 Which element has the atomic structure shown?



key

ⓔ electron

n neutron

⊙ nucleus

- A Al B P C S D Si

9 How many atoms of hydrogen are there in a molecule of ethanol, C_2H_5OH ?

- A 1 B 2 C 5 D 6

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

- A chromium
B copper
C silver
D sodium

11 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

12 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

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.

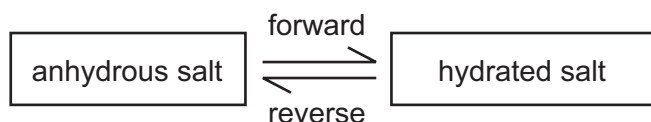
A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

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 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

16 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.

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

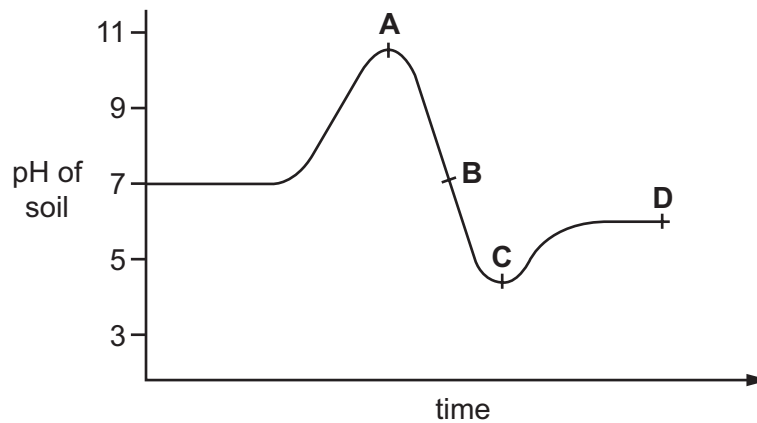
22 Elements in Group I of the Periodic Table react with water.

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

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

At which point was the soil neutral?



24 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 $Z \rightarrow W \rightarrow Y \rightarrow X$

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 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	✓	x
C	x	✓
D	x	x

27 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

28 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

29 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

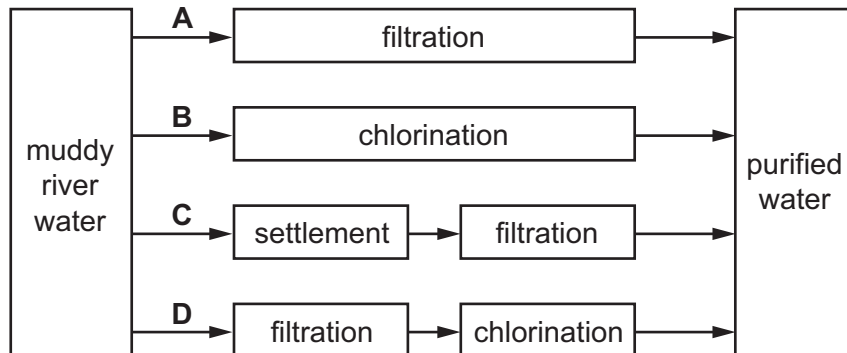
30 Which reaction involves oxidation?

- A heating hydrated copper(II) sulfate in the air
- B polymerisation of ethene
- C rusting of iron
- D thermal decomposition of calcium carbonate

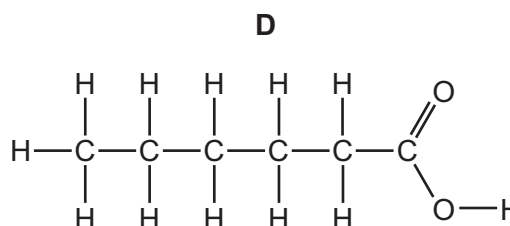
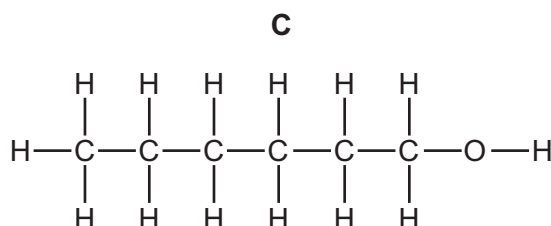
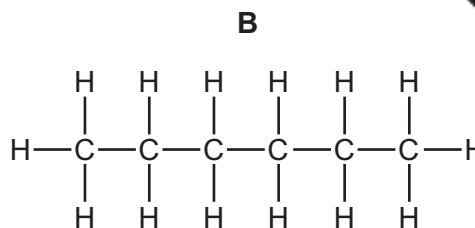
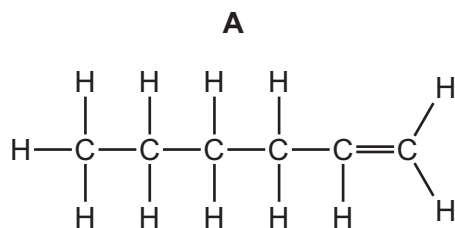
31 Which object is **least** likely to contain aluminium?

- A a bicycle frame
- B a hammer
- C a saucepan
- D an aeroplane body

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



36 Which molecular structure shows hexene?



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

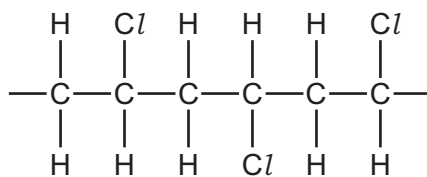
What is the correct order?

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

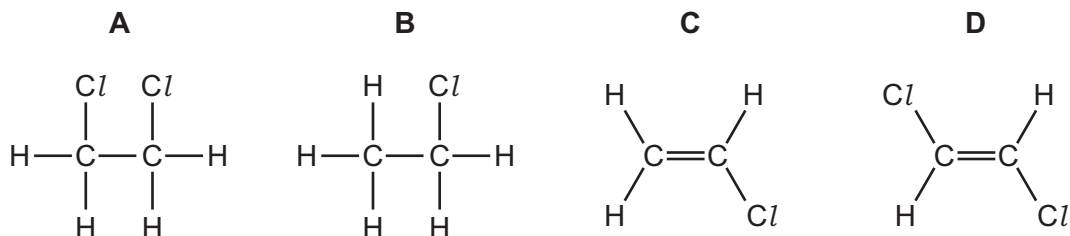
38 Which statement about alkenes is **not** correct?

- 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.

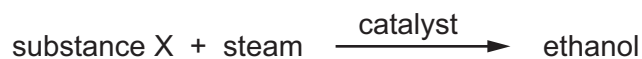
39 The diagram shows three repeat units in the structure of an addition polymer.



Which alkene monomer is used to make this polymer?



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					0					
1 H Hydrogen 1											2 He Helium 2						
3 Li Lithium 4	9 Be Beryllium 4											10 Ne Neon 10					
11 Na Sodium 11	12 Mg Magnesium 12	13 Al Aluminium 13	14 Si Silicon 14	15 P Phosphorus 15	16 S Sulfur 16	17 Cl Chlorine 17	18 Ar Argon 18					36 Kr Krypton 36					
19 K Potassium 19	20 Ca Calcium 20	21 Sc Scandium 21	22 Ti Titanium 22	23 V Vanadium 23	24 Cr Chromium 24	25 Mn Manganese 25	26 Fe Iron 26	27 Co Cobalt 27	28 Ni Nickel 28	29 Cu Copper 29	30 Zn Zinc 30	31 Ga Gallium 31	32 Ge Germanium 32	33 As Arsenic 33	34 Se Selenium 34	35 Br Bromine 35	36 Kr Krypton 36
37 Rb Rubidium 37	38 Sr Strontium 38	39 Y Yttrium 39	40 Zr Zirconium 40	41 Nb Niobium 41	42 Mo Molybdenum 42	43 Tc Technetium 43	44 Ru Ruthenium 44	45 Rh Rhodium 45	46 Pd Palladium 46	47 Ag Silver 47	48 Cd Cadmium 48	49 In Indium 49	50 Sn Tin 50	51 Sb Antimony 51	52 Te Tellurium 52	53 I Iodine 53	54 Xe Xenon 54
55 Cs Caesium 55	56 Ba Barium 56	57 La Lanthanum 57	72 Hf Hafnium 72	73 Ta Tantalum 73	74 W Tungsten 74	75 Re Rhenium 75	76 Os Osmium 76	77 Ir Iridium 77	78 Pt Platinum 78	79 Au Gold 79	80 Hg Mercury 80	81 Tl Thallium 81	82 Pb Lead 82	83 Bi Bismuth 83	84 Po Polonium 84	85 At Astatine 85	86 Rn Radon 86
87 Fr Francium 87	88 Ra Radium 88	89 Ac Actinium 89															

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	145 Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	238 Pa Protactinium 91	238 U Uranium 92	238 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

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

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

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

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