

Cambridge International Examinations

Cambridge International General Certificate of Secondary Education

CHEMISTRY

Paper 1 Multiple Choice

0620/11 May/June 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 Level1/Level 2 Certificate.

This document consists of 15 printed pages and 1 blank page.



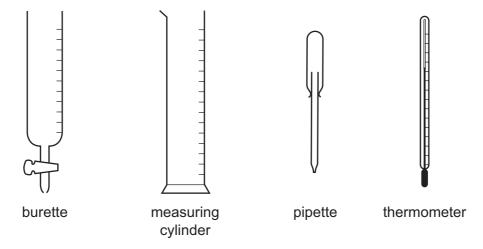
1 The diagram shows the result of dropping a purple crystal into water.



Which processes take place in this experiment?

	chemical reaction	dissolving	
Α	\checkmark	1	\checkmark
в	\checkmark	x	\checkmark
С	X	x	\checkmark
D	X	\checkmark	\checkmark

2 The four pieces of apparatus shown below are used in chemical experiments.



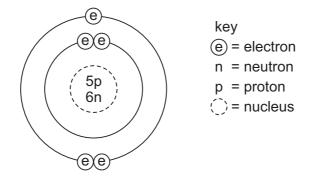
Which statement about the apparatus is correct?

- **A** The burette measures the volume of liquid added in a titration.
- **B** The measuring cylinder measures the mass of a substance used in an experiment.
- **C** The pipette measures the volume of gas given off in a reaction.
- **D** The thermometer measures the density of a solution.

3 Alcohol and water are completely miscible. This means when mixed together they form only one liquid layer.

Which method is used to separate alcohol from water?

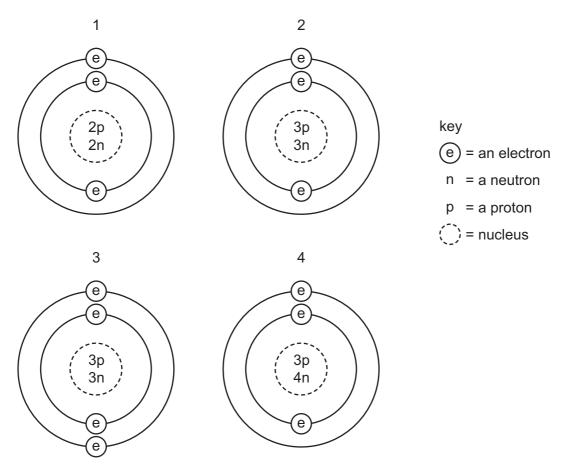
- A crystallisation
- **B** filtration
- **C** fractional distillation
- D precipitation
- 4 The diagram shows the structure of an atom of element X.



What is X?

- A boron
- B carbon
- C sodium
- D sulfur

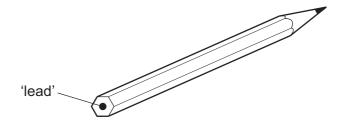
5 The diagrams show four particles.



Which two diagrams show atoms that are isotopes of each other?

A 1 and 2 B 1 and 3 C 2 and 3 D 2 and 4

6 The 'lead' in a pencil is made of a mixture of graphite and clay.



When the percentage of graphite is increased, the pencil slides across the paper more easily.

Which statement explains this observation?

- A Graphite has a high melting point.
- **B** Graphite is a form of carbon.
- **C** Graphite is a lubricant.
- **D** Graphite is a non-metal.

www.xtrapapers.com

7 Element X is in Group I of the Periodic Table. X reacts with element Y to form an ionic compound.

Which equation shows the process that takes place when X forms ions?

- $\mathbf{A} \quad \mathbf{X} \, + \, \mathbf{e}^{-} \, \rightarrow \, \mathbf{X}^{+}$
- $\textbf{B} \quad X \ \ e^{-} \ \rightarrow \ X^{-}$
- $\textbf{C} \quad X \ \textbf{+} \ \textbf{e}^{-} \ \rightarrow \ \textbf{X}^{-}$
- $\textbf{D} \quad X \ \ e^{-} \ \rightarrow \ X^{\scriptscriptstyle +}$
- 8 Solid F is an element.

Solid G is a compound.

Neither solid conducts electricity but G conducts electricity when dissolved in water.

These properties suggest that F is1..... and that G is2..... with3..... bonds.

	1	3	
Α	diamond	AgC1	covalent
в	diamond	NaC1	ionic
С	graphite	AgC1	ionic
D	graphite	NaC1	covalent

Which words correctly complete gaps 1, 2 and 3?

9 A compound contains one atom of calcium, two atoms of hydrogen and two atoms of oxygen.

What is the correct chemical formula of the compound?

A CaO_2H_2 **B** HOCaOH **C** H_2CaO_2 **D** $Ca(OH)_2$

10 In athletics, banned drugs such as nandrolone have been taken illegally to improve performance. Nandrolone has the molecular formula $C_{18}H_{26}O_2$.

What is the relative molecular mass, M_r , of nandrolone?

(Relative atomic mass: H = 1; C = 12; O = 16)

- **A** 46 **B** 150 **C** 274 **D** 306
- 11 Which substance will not conduct electricity?
 - A aluminium
 - **B** copper
 - **C** plastic
 - D steel

12 Which products are formed at the anode and cathode when electricity is passed through molten lead(II) bromide?

	anode (+)	cathode (-)
Α	bromide ions	lead ions
В	bromine molecules	lead atoms
С	lead atoms	bromine molecules
D	lead ions	bromide ions

13 Some reactions are endothermic.

How does the temperature and energy change in an endothermic reaction?

	temperature change	energy change
Α	decreases	energy taken in
В	decreases	energy given out
С	increases	energy taken in
D	increases	energy given out

- **14** Two chemical processes are described below.
 - In the combustion of methane, energy is1.....
 - In the electrolysis of molten lead(II) bromide, energy is2......

Which words correctly complete gaps 1 and 2?

	1	2		
Α	given out	given out		
В	given out	taken in		
С	taken in	given out		
D	taken in	taken in		

- 15 Which equation shows an oxidation reaction?
 - $\textbf{A} \quad \textbf{C} \ \textbf{+} \ \textbf{O}_2 \ \rightarrow \ \textbf{CO}_2$
 - $\textbf{B} \quad \text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
 - $\textbf{C} \quad \text{CaO} \ \textbf{+} \ 2\text{HC}\textit{l} \ \rightarrow \ \text{CaC}\textit{l}_2 \ \textbf{+} \ \text{H}_2\text{O}$
 - $\textbf{D} \quad N_2O_4 \ \rightarrow \ 2NO_2$

16 In separate experiments, a catalyst is added to a reaction mixture and the temperature of the mixture is decreased.

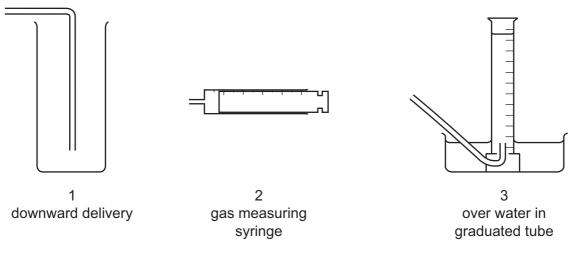
What are the effects of these changes on the rate of the reaction?

	catalyst added	temperature decreased		
Α	faster	faster		
в	faster	slower		
С	slower	faster		
D	slower	slower		

17 An experiment is carried out to investigate the rate of reaction when calcium carbonate is reacted with hydrochloric acid.

The volume of carbon dioxide gas given off is measured at different intervals of time.

The diagram shows pieces of apparatus used to collect gases.



Which apparatus is suitable to collect and measure the volume of the carbon dioxide?

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

18 The equation shows a reaction that is reversed by changing the conditions.

 $CuSO_4.5H_2O$ \longrightarrow $CuSO_4$ + $5H_2O$

How can the forward reaction be reversed?

	by adding water	by heating
Α	\checkmark	1
в	\checkmark	X
С	x	1
D	×	x

- 19 Which statements about alkalis are correct?
 - 1 When reacted with an acid, the pH of the alkali increases.
 - 2 When tested with litmus, the litmus turns blue.
 - 3 When warmed with an ammonium salt, ammonia gas is given off.
 - A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only
- 20 Only two elements are liquid at 20 °C. One of these elements is shiny and conducts electricity.

This suggests that this element is a1..... and therefore its oxide is2......

Which words correctly complete gaps 1 and 2?

	1	2		
Α	metal	acidic		
В	metal	basic		
С	non-metal	acidic		
D	non-metal	basic		

- 21 Which acid reacts with ammonia to produce the salt ammonium sulfate?
 - A hydrochloric
 - B nitric
 - C phosphoric
 - D sulfuric

22 Aqueous sodium hydroxide is added to solid X and the mixture is heated.

A green precipitate is formed and an alkaline gas is given off.

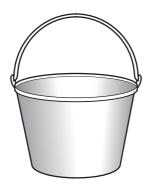
Which ions are present in X?

- **A** NH_4^+ and Fe^{2+}
- **B** NH_4^+ and Fe^{3+}
- **C** OH^- and Fe^{2+}
- **D** OH^- and Fe^{3+}
- 23 Which statement about the Periodic Table is correct?
 - A Elements in the same period have the same number of outer electrons.
 - **B** The elements on the left are usually gases.
 - **C** The most metallic elements are on the left.
 - D The relative atomic mass of the elements increases from right to left.
- 24 Why is argon gas used to fill electric lamps?
 - A It conducts electricity.
 - **B** It glows when heated.
 - C It is less dense than air.
 - D It is not reactive.
- **25** An element melts at $1455 \,^{\circ}$ C, has a density of $8.90 \,\text{g/cm}^3$ and forms a green chloride.

Where in the Periodic Table is this element found?

												Α		
в														
								С						
													D	

26 The diagrams show two items that may be found in the home. Each item contains zinc.



zinc plated bucket

In which is zinc used as an alloy?

	bucket	door-knocker
Α	\checkmark	1
в	\checkmark	x
С	X	✓
D	X	X



brass door-knocker

27 In an experiment, three test-tubes labelled X, Y and Z were half-filled with dilute hydrochloric acid. A different metal was added to each test-tube. After a few minutes the following observations were made.

In tube X, bubbles slowly rose to the surface.

In tube Y, there was a rapid release of bubbles.

In tube Z, no bubbles were produced.

Which three metals match the observations?

	tube X	tube Z	
Α	copper	zinc	iron
в	magnesium	iron	copper
С	zinc	magnesium	copper
D	zinc	magnesium	iron

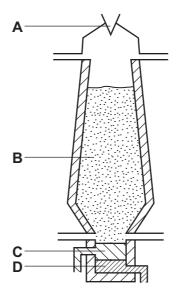
28 The table shows properties of four metals.

Which metal is the most suitable for aircraft construction?

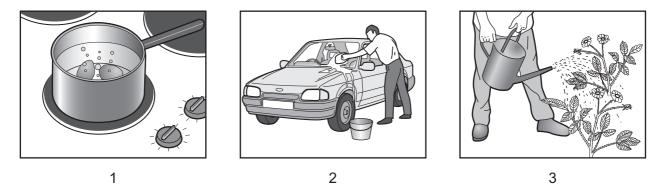
	density	strength	resistance to corrosion
Α	high	high	low
в	high	low	low
С	low	high	high
D	low	low	high

29 The diagram shows a blast furnace.

In which part is iron ore changed to iron?



30 The diagram shows some uses of water in the home.



For which uses is it important for the water to have been treated?

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

www.xtrapapers.com

31 Four steel paper clips are treated as described before being placed in a beaker of water.

Which paper clip rusts most quickly?

- A coated with grease
- B dipped in paint and allowed to dry
- **C** electroplated with zinc
- D washed with soap and rinsed
- 32 Which compound contains two of the three essential elements needed for a complete fertiliser?
 - A ammonium chloride
 - B ammonium nitrate
 - **C** ammonium phosphate
 - **D** ammonium sulfate
- **33** When compound X is heated, it changes colour from green to black. Compound Y is formed and a gas is given off which turns limewater milky.

What are X and Y?

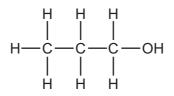
	Х	Y		
Α	calcium carbonate	calcium oxide		
в	copper carbonate	carbon		
С	copper carbonate	copper oxide		
D	copper sulfate	copper oxide		

34 Acid rain is formed when sulfur dioxide and oxides of nitrogen dissolve in rain water.

Which problem is not caused by acid rain?

- **A** breathing difficulties
- B dying trees
- C erosion of statues
- D lowered pH of lakes

- 35 Which pollutant gas is produced by the decomposition of vegetation?
 - A carbon monoxide
 - **B** methane
 - C nitrogen oxide
 - D sulfur dioxide
- 36 Which type of compound is shown?



- A alcohol
- B alkane
- **C** alkene
- D carboxylic acid
- 37 The table shows the composition of four different types of petroleum (crude oil).

fraction	Arabian Heavy /%	Arabian Light /%	Iranian Heavy /%	North Sea /%
gasoline	18	21	21	23
kerosene	11.5	13	13	15
diesel oil	18	20	20	24
fuel oil	52.5	46	46	38

Which type of petroleum is best for the motor vehicle industry?

- **A** Arabian Heavy
- **B** Arabian Light
- C Iranian Heavy
- D North Sea

www.xtrapapers.com

38 Alkenes are manufactured by cracking hydrocarbons obtained from petroleum.

Which row describes the process of cracking?

	size of X molecules	size of Y molecules	catalyst required	temperature required	
Α	large	small	no	low	
В	large	small	yes	high	
С	small	large	no	low	
D	small	large	yes	high	

39 X, Y and Z are three hydrocarbons.

 $X CH_2=CH_2 Y CH_3-CH=CH_2 Z CH_3-CH_2-CH=CH_2$

What do compounds X, Y and Z have in common?

- 1 They are all alkenes.
- 2 They are all part of the same homologous series.
- 3 They all have the same boiling point.
- A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

40 Which statements about ethanol are correct?

- 1 It can be made by fermentation.
- 2 It is an unsaturated compound.
- 3 It burns in air and can be used as a fuel.

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

BLANK PAGE

	0	Helium 4	20 Neon 10 Argon 18 Argon	84 Kr ypton 36	131 Xe 54	Radon 86	175 Lutetium 71 Lawrencium 103
	-II	N	19 9 Fluorine 35.5 35.5 17 17 Chlorine	80 Bromine 35 35 35 35 35 33	127 I Iodine 53	At Atlatine 85	7 7 7 Nobelium 102
	⋝		16 Oxygen 32 Oxygen 32 Suffur 16 Suffur 16 Suffur 16 Oxygen 16 Oxygen 16 Oxygen 16 Oxygen 16 Oxygen 16 Oxygen 17 Oxy	79 Selenium 34	128 Te Tellurium 52	Polonium 84	169 Thulium 69 Mendelevium Mendelevium
	>		14 Nitrogen 31 Phosphorus 15	75 AS ^{Arsenic} 33	122 Sb Antimony 51	209 Bi smuth 83	167 Er Er Erbium 68 F m 100
	≥		6 Carbon 6 28 28 14 Silicon	73 Ge ^{Germanium} 32	119 Sn 50	207 Pb 82 Lead	165 Homium 67 Einsteinium 99
	≡		11 B Boron 5 27 Auminium 13	70 Gal 31	115 In Indium 49	204 T 7 81	162 Dysprosium 66 Californium 88
ents				65 Zn ^{Zinc}	112 Cadmium 48	201 Hg ^{Mercury} 80	159 Tabum 65 Berkelum 97
Ine Periodic Table of the Elements Group	4 Hydogen			64 Copper 29	108 Ag Silver 47	Au Gould	157 Gadolinium 64 Cm B6 Curium
DIE OT U				59 Nickel 28	106 Pd Palladium 46	195 Pt 78	152 Eu 63 Americium 95
			59 CO ^{Cobalt}	103 Rh Rhodium 45	192 Ir 77	150 Samarlum 62 Plutonlum 94	
		Hydrogen		56 Fe Iron 26	101 Rut Ruthenium 44	190 OS Osmium 76	Promethium 61 Neptunium 03
				55 Mn Manganese 25	Tc Technetium 43	186 Re 75	144 Neodymium 60 Uranium 92
				52 Chromium 24	96 Mo Molybdenum 42	184 V 74	141 Praseodymium 59 Protactinium
			_	51 Vanadium 23	93 Ni obium 41	181 Tantalum 73	Certum 58 232 232 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
			-	48 Titanium 22	91 Zr Zirconium 40	178 Hafnium 72] mic mass bol nic) number
				45 Scandium 21	89 Vttrium 39	139 Lanthanum 57 * 227 Activitim	<pre>89 Addition 89 Addition 80 Addition 8</pre>
	=		9 Beryllium 4 24 Magnesium	40 Calcium 20	88 St rontium 38	137 Ba Banum 56 226 Ra	8 8 Actimum *58-71 Lanthanoid series 190-103 Actinoid series 1 a * a = relative a Key X x = atomic s b b = proton (a
	-		Lithium 3 23 23 23 23 23 23 23 11	39 Potassium 19	85 Rb Rubidium 37	133 Caesium 55 Francium	*58-71 L 190-103 Key

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

16