eduresourceza.com

Downloaded from eduresourceza.com

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CHEMISTRY **0620/11**

Paper 1 Multiple Choice **May/June 2010**

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, highlighters, 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.

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.
You may use a calculator.

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

© UCLES 2010

UNIVERSITY of CAMBRIDGE
International Examinations

Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

1 The diagram shows a cup of tea.

Which row describes the water particles in the air above the cup compared with the water particles in the cup?

	moving faster	closer together
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

2 A fruit drink coloured orange contains a dissolved mixture of red and yellow colouring agents. One of these colouring agents is suspected of being illegal.

Which method could be used to show the presence of this illegal colouring agent?

A chromatography

B distillation

C evaporation

D filtration

3 A student carries out an experiment to find how fast 3 cm pieces of magnesium ribbon dissolve in 10 cm^3 samples of sulfuric acid at different temperatures.

Which piece of apparatus does the student **not** need?

A balance

B measuring cylinder

C stop-clock

D thermometer

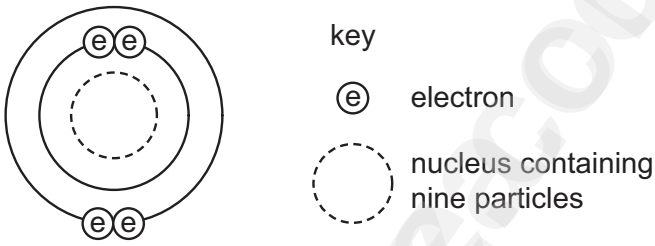
© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

4 Which row shows the change that takes place when element X gains the new particle shown?

	particle gained	change
A	electron	an isotope of element X is formed
B	electron	the element one place to the right of X in the Periodic Table is formed
C	proton	an isotope of element X is formed
D	proton	the element one place to the right of X in the Periodic Table is formed

5 The diagram shows an atom.



What is the proton number and neutron number of the atom?

	proton number	neutron number
A	4	5
B	4	9
C	5	4
D	5	9

6 The symbols of two atoms may be written as shown.

$^{52}_{23}X \qquad ^{52}_{24}Y$

Which statement about these atoms is correct?

A They are different elements because they have different numbers of neutrons.

B They are different elements because they have different numbers of protons.

C They are isotopes of the same element because they have the same nucleon number.

D They are isotopes of the same element because they have the same proton number.

Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

7 Which name is given to mixtures of metals?

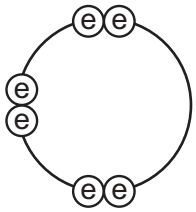
A alloys

B compounds

C ores

D salts

8 Element X has six electrons in its outer shell.



key
ⓔ = electron

How could the element react?

A by gaining two electrons to form a positive ion

B by losing six electrons to form a negative ion

C by sharing two electrons with two electrons from another element to form two covalent bonds

D by sharing two electrons with two electrons from another element to form four covalent bonds

9 In which compounds are pairs of electrons shared between atoms?

1 sodium chloride

2 methane

3 lead bromide

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

10 Hydrogen and chlorine react as shown.

1 molecule of hydrogen + 1 molecule of chlorine → 2 molecules of hydrogen chloride

What is the equation for this reaction?

A $2H + 2Cl \rightarrow 2HCl$

B $2H + 2Cl \rightarrow H_2Cl_2$

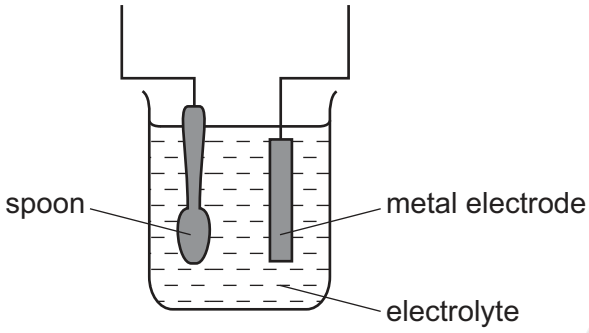
C $H_2 + Cl_2 \rightarrow 2HCl$

D $H_2 + Cl_2 \rightarrow H_2Cl_2$

© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

11 The diagram shows apparatus for plating a spoon with silver.



Which statement is **not** correct?

A Silver would stick to the spoon because it is a very reactive metal.

B The electrolyte would be a silver salt dissolved in water.

C The metal electrode would be made from silver.

D The spoon would be connected to the negative of the power supply.

12 Aqueous copper(II) sulfate solution is electrolysed using inert electrodes.

Copper(II) ions (Cu^{2+}), hydrogen ions (H^+), hydroxide ions (OH^-) and sulfate ions (SO_4^{2-}) are present in the solution.

To which electrodes are the ions attracted during this electrolysis?

	attracted to anode	attracted to cathode
A	Cu^{2+} and H^+	OH^- and SO_4^{2-}
B	Cu^{2+} and SO_4^{2-}	H^+ and OH^-
C	H^+ and OH^-	Cu^{2+} and SO_4^{2-}
D	OH^- and SO_4^{2-}	Cu^{2+} and H^+

13 Three electrolysis cells are set up. Each cell has inert electrodes.

The electrolytes are listed below.

cell 1 aqueous sodium chloride

cell 2 concentrated hydrochloric acid

cell 3 molten lead(II) bromide

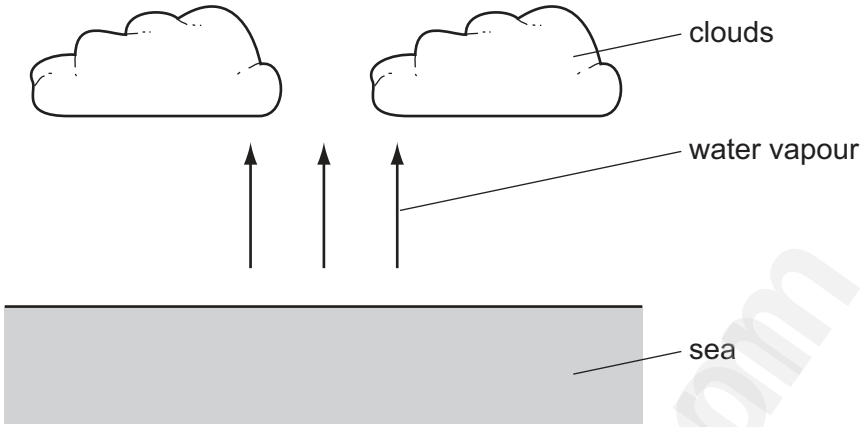
In which cells is a gas formed at **both** electrodes?

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

Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

14 Clouds are formed when water vapour evaporates from the sea.



What is the energy change and what name is given to the type of change when water evaporates?

	energy change	type of change
A	energy given out	endothermic
B	energy given out	exothermic
C	energy taken in	endothermic
D	energy taken in	exothermic

15 Which process is **not** exothermic?

A burning a fossil fuel

B obtaining lime from limestone

C radioactive decay of ^{235}U

D reacting hydrogen with oxygen

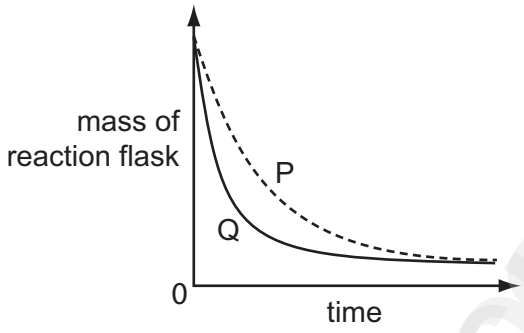
© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

16 A student investigates the rate of reaction between marble chips and hydrochloric acid.

The loss in mass of the reaction flask is measured.

The graph shows the results of two experiments, P and Q.



Which change explains the difference between P and Q?

A A catalyst is added in P.

B A higher temperature is used in P.

C Bigger marble chips are used in Q.

D Hydrochloric acid is more concentrated in Q.

17 When pink cobalt(II) sulfate crystals are heated, they form steam and a blue solid.

When water is added to the blue solid, it turns pink and becomes hot.

Which terms describe the pink cobalt(II) sulfate crystals and the reactions?

	pink cobalt sulfate	reactions
A	aqueous	irreversible
B	aqueous	reversible
C	hydrated	irreversible
D	hydrated	reversible

18 Iron is extracted from iron oxide using carbon monoxide as shown in the equation.

iron oxide + carbon monoxide → iron + carbon dioxide

What does the equation show?

A Carbon monoxide is oxidised to carbon dioxide.

B Carbon monoxide is reduced to carbon dioxide.

C Iron is oxidised to iron oxide.

D Iron oxide is oxidised to iron.

Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

19 Aqueous sodium hydroxide is added to a 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+}

20 An aqueous solution of the organic compound methylamine has a pH greater than 7.

Which statement about methylamine is correct?

A It neutralises an aqueous solution of sodium hydroxide.

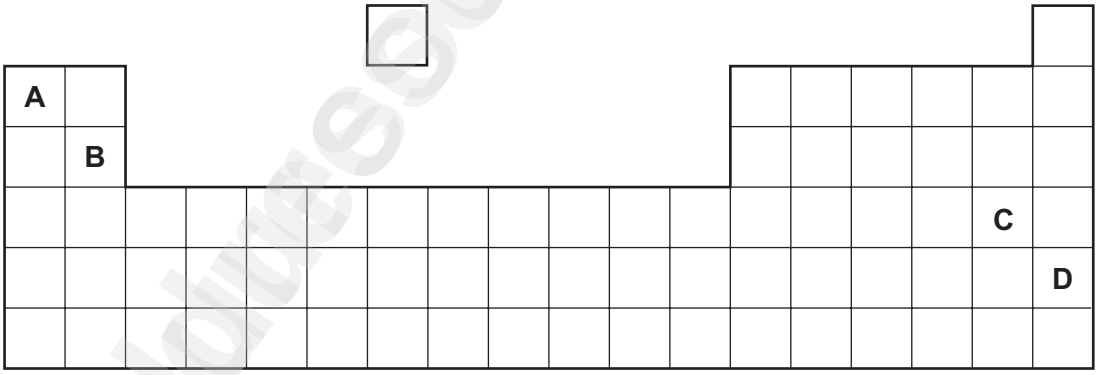
B It reacts with copper(II) carbonate to give carbon dioxide.

C It reacts with hydrochloric acid to form a salt.

D It turns blue litmus red.

21 The positions in the Periodic Table of four elements are shown.

Which element is **most** likely to form an acidic oxide?



© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

22 An excess of copper(II) oxide is added to dilute sulfuric acid to make crystals of hydrated copper(II) sulfate.

The processes listed may be used to obtain crystals of hydrated copper(II) sulfate.

1 concentrate the resulting solution

2 filter

3 heat the crystals

4 wash the crystals

Which processes are needed and in which order?

A 1, 2, 3 and 4

B 1, 2, 4 and 3

C 2, 1, 2 and 3

D 2, 1, 2 and 4

23 Which is **not** a property of Group I metals?

A They are soft and can be cut with a knife.

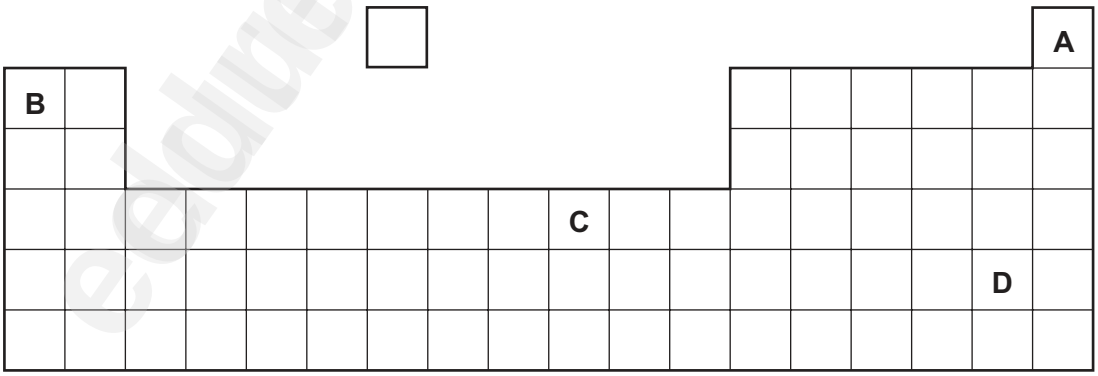
B They corrode rapidly when exposed to oxygen in the air.

C They produce an acidic solution when they react with water.

D They react rapidly with water producing hydrogen gas.

24 An element melts at 1455 °C, has a density of 8.90 g / cm^3 and forms a green chloride.

Where in the Periodic Table is this element found?

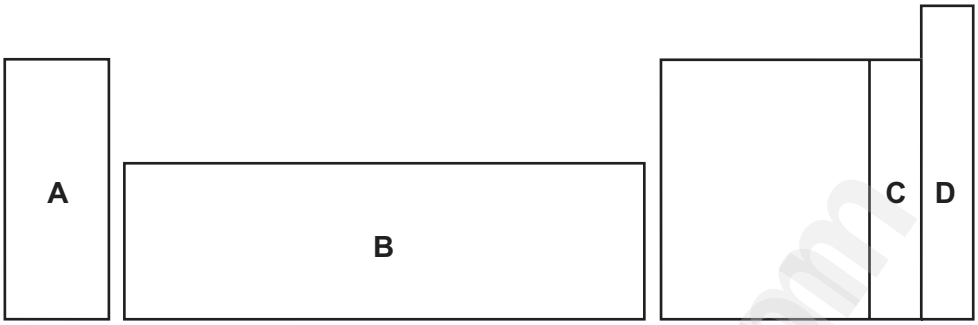


Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

25 An element does not conduct electricity and exists as diatomic molecules.

In which area of the Periodic Table is the element to be found?



26 Solutions of a halogen and a sodium halide are mixed.

Which mixture darkens in colour because a reaction occurs?

A bromine and sodium chloride

B bromine and sodium fluoride

C chlorine and sodium fluoride

D chlorine and sodium iodide

27 Copper, iron and zinc are all used as pure metals.

Which of these three metals are also used in alloys?

	copper	iron	zinc
A	✓	✓	✓
B	✓	✓	✗
C	✗	✓	✓
D	✗	✗	✓

28 Some properties of four elements are shown in the table.

Which element is a metal?

	melting point / °C	electrical conductivity when liquid	electrical conductivity when solid
A	–7	low	low
B	801	high	low
C	1535	high	high
D	3550	low	low

© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

29 A student added dilute hydrochloric acid to four metals and recorded the results.

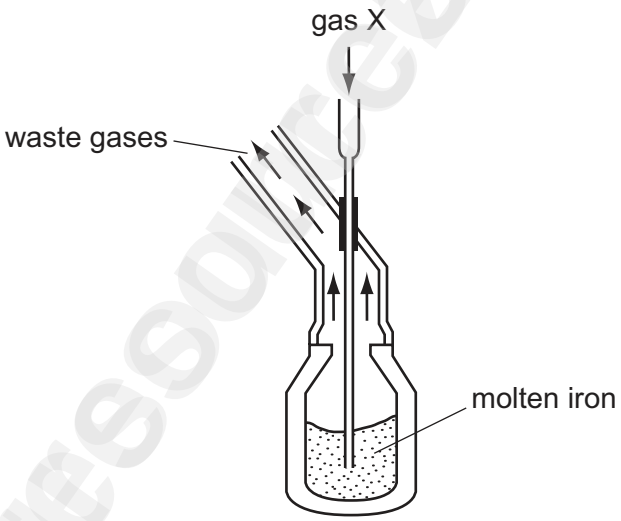
Not all of the results are correct.

	results	
	metal	gas given off
1	copper	yes
2	iron	yes
3	magnesium	no
4	zinc	yes

Which two results are correct?

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

30 The diagram shows the manufacture of steel.



What is gas X?

A carbon dioxide

B chlorine

C hydrogen

D oxygen

© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

31 Aluminium is an important metal with many uses.

Some of its properties are listed.

1 It is a good conductor of heat.

2 It is a reactive metal.

3 It has a low density.

4 It has an oxide layer that prevents corrosion.

Which set of properties help to explain the use of aluminium for cooking and storing food?

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

32 Which statements about water are correct?

1 Water is treated with chlorine to kill bacteria.

2 Household water may contain salts in solution.

3 Water is used in industry for cooling.

4 Water for household use is filtered to remove soluble impurities.

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

33 Which compound in polluted air can damage stonework and kill trees?

A carbon dioxide

B carbon monoxide

C lead compounds

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.

© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

35 To grow roses, a fertiliser containing nitrogen, phosphorus and potassium is needed.

For the best flowers, the fertiliser should contain a high proportion of potassium.

Which fertiliser is best for roses?

fertiliser	proportion by mass		
	N	P	K
A	9	0	25
B	13	13	20
C	29	5	0
D	29	15	5

36 The diagram shows three types of item.

Which method of rust prevention can be used for all three types of item?

A coating with plastic

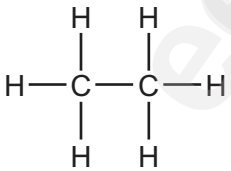
B covering with grease

C galvanising

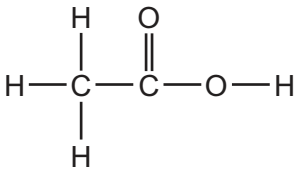
D using stainless steel

37 Which structure is **incorrect**?

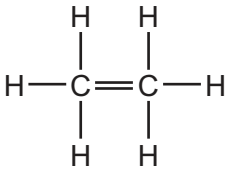
A



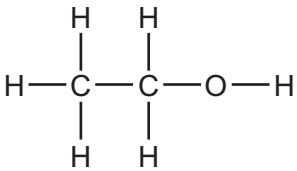
B



C



D

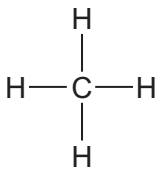


Downloaded from eduresourceza.com

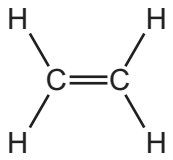
Downloaded from eduresourceza.com

38 Which structure shows a compound that belongs to a **different** homologous series to propane?

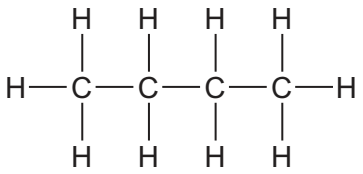
A



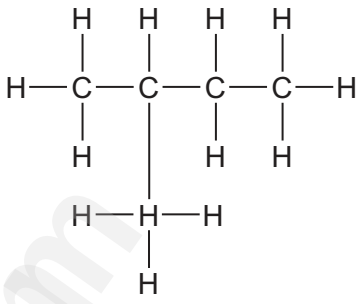
B



C



D



39 A macromolecule is a very large molecule.

Macromolecules can be made by joining smaller molecules together. This is called polymerisation.

Which row in the table describes the formation of a polymer?

	monomer	polymer
A	ethane	poly(ethane)
B	ethene	poly(ethene)
C	ethane	poly(ethene)
D	ethene	poly(ethane)

40 Diesel, petrol and bitumen are all

A fuels.

B hydrocarbons.

C lubricants.

D waxes.

© UCLES 2010
Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

BLANK PAGE

eduresourceza.com

Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

DATA SHEET
The Periodic Table of the Elements

Group I	Group II											Group III	Group IV	Group V	Group VI	Group VII	Group 0
							1 **H** Hydrogen 1										4 **He** Helium 2
7 **Li** Lithium 3	9 **Be** Beryllium 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
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
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	**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
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	**Po** Polonium 84	**At** Astatine 85	**Rn** Radon 86
Fr Francium 87	226 **Ra** Radium 88	227 **Ac** Actinium 89 †															

140 **Ce** Cerium 58	141 **Pr** Praseodymium 59	144 **Nd** Neodymium 60	**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	**Pa** Protactinium 91	238 **U** Uranium 92	**Np** Neptunium 93	**Pu** Plutonium 94	**Am** Americium 95	**Cm** Curium 96	**Bk** Berkelium 97	**Cf** Californium 98	**Es** Einsteinium 99	**Fm** Fermium 100	**Md** Mendelevium 101	**No** Nobelium 102	**Lr** Lawrencium 103

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

Key

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

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).

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.

University of 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.

Downloaded from eduresourceza.com