Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CHEMISTRY **5070/11**

Paper 1 Multiple Choice **May/June 2014**

1 hour

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

* 2 5 5 0 2 1 6 8 4 5 *

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.

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

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1 Which statement is **not** correct?

A Air is a mixture.

B Ammonia is a compound.

C Methane is a compound.

D Sea water is a compound.

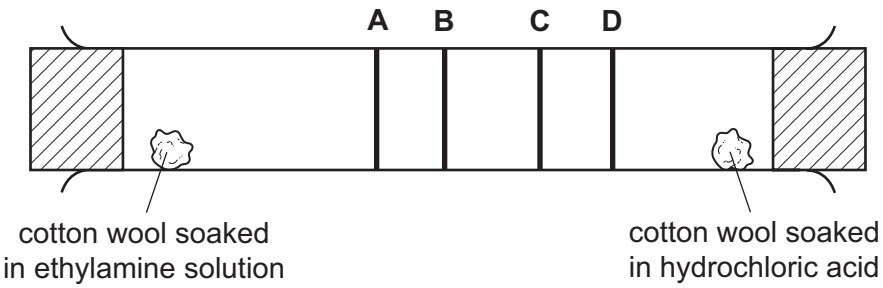
2 A radioactive isotope of carbon has more nucleons than the non-radioactive isotope, $^{12}_{6}C$.

How many protons, neutrons and electrons could there be in this **radioactive** isotope of carbon?

	protons	neutrons	electrons
A	6	6	6
B	6	8	6
C	8	6	8
D	8	8	8

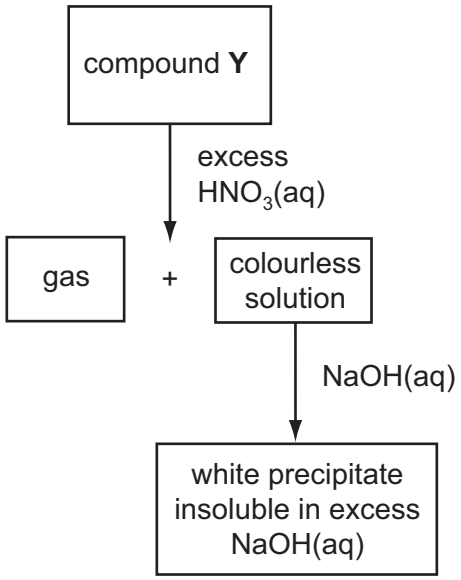
3 Ethylamine gas, $C_2H_5NH_2$, and hydrogen chloride gas, HC*l*, react together to form a white solid, ethylamine hydrochloride.

At which position in the tube would a ring of solid white ethylamine hydrochloride form?



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4 The scheme shows a sequence of reactions starting from compound **Y**.



What could the compound **Y** be?

A aluminium sulfate

B calcium carbonate

C copper(II) carbonate

D zinc carbonate

5 Which electronic configurations represent three metallic elements in the same period of the Periodic Table?

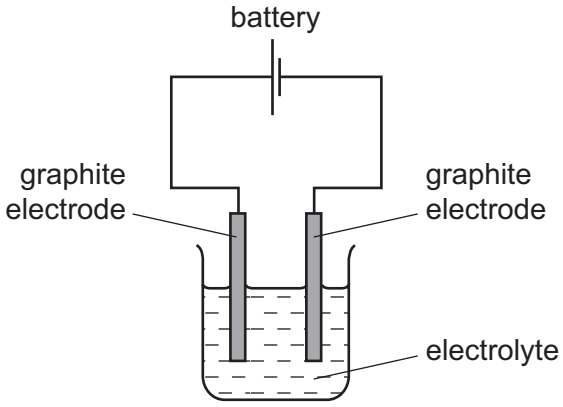
	element 1	element 2	element 3
A	2, 8, 7	2, 8, 8	2, 8, 1
B	2, 1	2, 8, 1	2, 8, 8, 1
C	2, 2	2, 3	2, 4
D	2, 8, 1	2, 8, 2	2, 8, 3

6 Which molecule has the **largest** number of electrons involved in covalent bonds?

A C_2H_4 **B** CO_2 **C** CH_3OH **D** N_2

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7 Graphite is often used as the electrodes in the electrolysis of solutions.



Which particles are involved in the conduction of electricity by graphite?

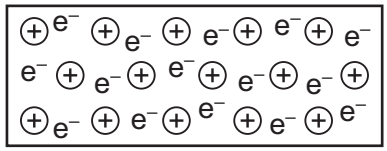
A electrons only

B negative ions only

C positive ions and electrons

D positive ions and negative ions

8 Element *X* has a lattice of positive ions and a 'sea of electrons'.



Which property will *X* have?

A It conducts electricity by the movement of ions and electrons.

B It has a high melting point.

C It is decomposed by an electric current.

D It is not malleable.

9 An element, *E*, forms a hydride, EH_4, which contains 90.0% by mass of *E*.

If the relative atomic mass of hydrogen is 1, what is the relative atomic mass of *E*?

A 9 **B** 36 **C** 86 **D** 90

10 A piece of chalk has a mass of 23.0 g. Chalk is impure calcium carbonate. When analysed, the chalk is found to contain 0.226 moles of pure calcium carbonate.
[M_r: $CaCO_3$, 100]

What is the percentage purity of the piece of chalk?

A 0.983% **B** 1.02% **C** 77.0% **D** 98.3%

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11 Aqueous potassium iodide, KI(aq), can be used as a test reagent in redox reactions.

Iodide ions are readily ……X…… . A positive result for the test is when the solution changes colour from ……Y…… to ……Z…… .

Which words correctly complete gaps X, Y and Z?

	X	Y	Z
A	oxidised	brown	colourless
B	oxidised	colourless	brown
C	reduced	brown	colourless
D	reduced	colourless	brown

12 Which element is **most** likely to be used as an industrial catalyst?

A Na **B** Ni **C** Pb **D** Sr

13 Which solution containing one mole per dm^3 of the compound would have the lowest pH?

A ethanoic acid

B hydrochloric acid

C sodium chloride

D sodium hydrogencarbonate

14 Which statement about oxides is correct?

A A basic oxide is an oxide of a non-metal.

B Acidic oxides contain ionic bonds.

C An amphoteric oxide contains a metal.

D Basic oxides are always gases.

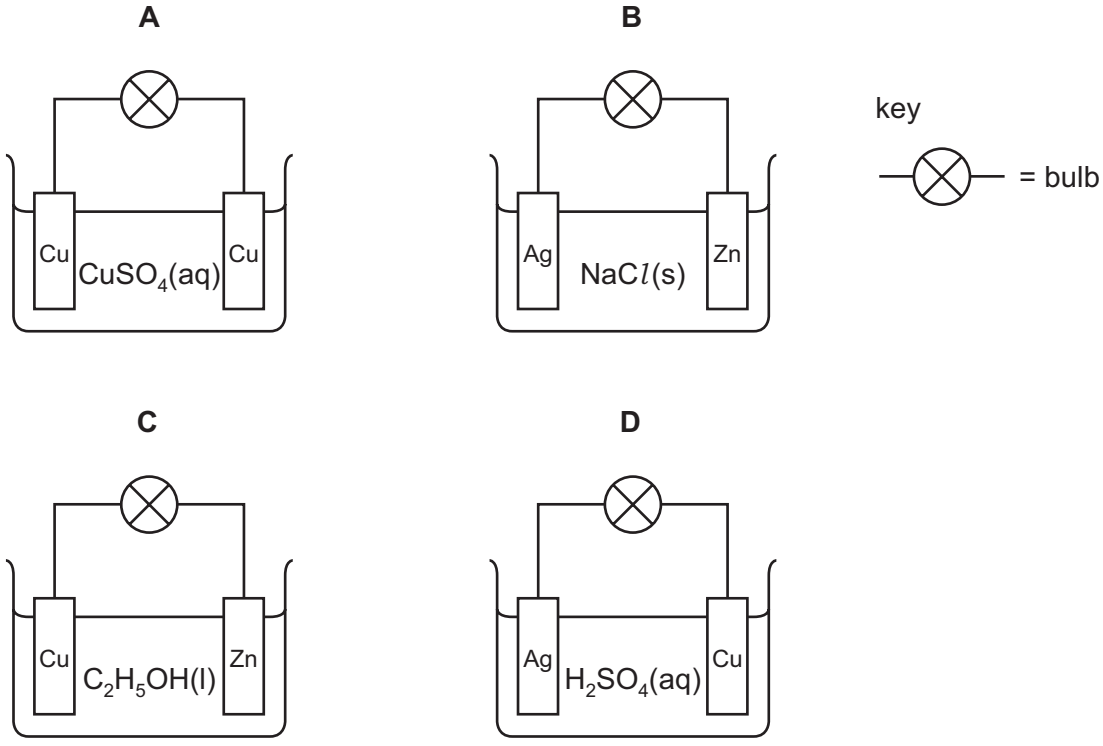
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15 Bitumen, diesel, naphtha and paraffin (kerosene) are all fractions obtained by the fractional distillation of petroleum.

Which row gives a correct use for the named fraction?

	fraction	use
A	bitumen	a source of polish
B	diesel	a fuel for aircraft engines
C	naphtha	a fuel for heating
D	paraffin	a fuel for cooking

16 In which circuit does the bulb light?



17 An element is in Period 3 and Group VII of the Periodic Table.

Which statement about this element is correct?

A The element will form 1+ ions.

B The element will have 3 electrons in its outer shell.

C The element will have 7 electrons in its outer shell.

D The element will have 7 shells of electrons in its atom.

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18 The table contains information about the physical properties of the elements chlorine, copper and iron.

element	melting point / °C	boiling point / °C
chlorine	–101	W
copper	X	2582
iron	1539	Y

In the table above, what are the correct values of W, X and Y?

	W	X	Y
A	–34	1083	445
B	–34	1083	2887
C	–34	2887	445
D	445	2887	1083

19 Petroleum is separated into fractions by fractional distillation.

Which fraction distils off at the highest temperature?

A diesel

B paraffin (kerosene)

C lubricating oils

D petrol (gasoline)

20 Ammonia is made by a reversible reaction between nitrogen and hydrogen.

$$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g) \qquad \Delta H = -92\,kJ/mol$$

What is the effect of increasing the pressure in this process?

A Less heat is produced.

B More ammonia is formed.

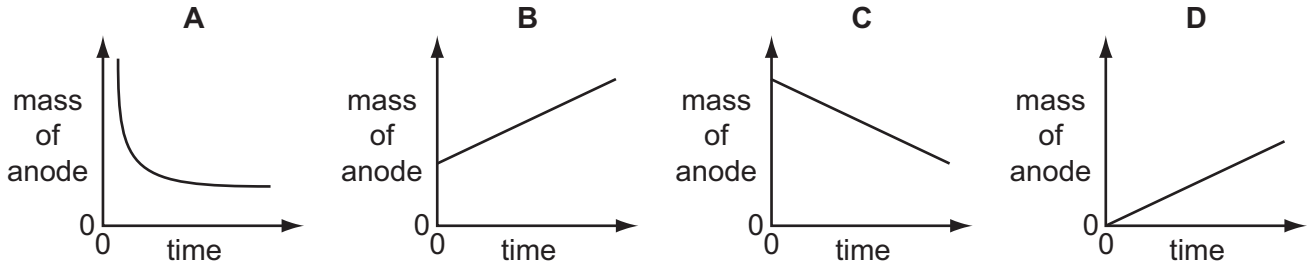
C More nitrogen is present at equilibrium.

D The reaction slows down.

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21 Aqueous copper(II) sulfate is electrolysed using copper electrodes. The current is constant and the anode (positive electrode) is weighed at regular intervals.

Which graph is obtained when the mass of the anode is plotted against time?



22 In the extraction of aluminium by electrolysis, its oxide is dissolved in molten cryolite. Cryolite is a sodium salt.

Aluminium is deposited at the ……1…… and it can be deduced that aluminium is ……2…… sodium in the reactivity series.

Which words correctly complete gaps 1 and 2?

	1	2
A	+ve electrode	above
B	+ve electrode	below
C	–ve electrode	above
D	–ve electrode	below

23 Which substance is **not** a raw material used in the manufacture of sulfuric acid?

A air

B sulfur

C sulfur dioxide

D water

24 A student mixed together aqueous solutions of **Y** and **Z**. A white precipitate formed.

Which could **not** be **Y** and **Z**?

	Y	**Z**
A	hydrochloric acid	silver nitrate
B	hydrochloric acid	sodium nitrate
C	sodium chloride	lead(II) nitrate
D	sodium chloride	silver nitrate

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25 Which property would all the hydrogen compounds of the Group VII elements possess?

A be covalent

B be solids at room temperature

C form alkaline aqueous solutions

D conduct electricity when molten

26 Which particle is found in iodine vapour?

A I **B** I^- **C** I^+ **D** I_2

27 What suggests that metal *M* is **not** in Group I of the Periodic Table?

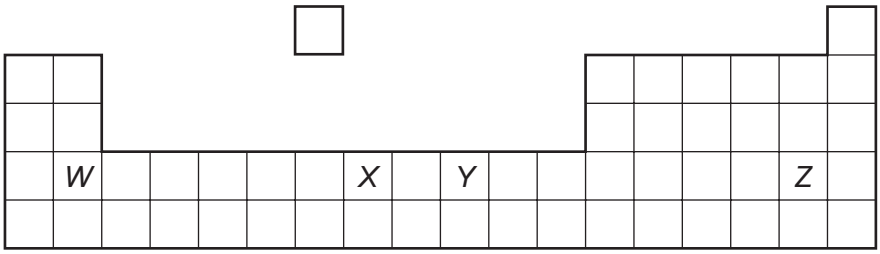
A *M* has a bright, silvery appearance and is a good conductor of electricity.

B *M* is hard and difficult to cut.

C *M* produces an alkaline solution when it reacts with water.

D *M* produces hydrogen gas when it reacts with water.

28 The diagram shows an outline of part of the Periodic Table.



Which statements are correct?

1 Elements *W*, *X* and *Y* form coloured compounds.

2 Elements *X*, *Y* and *Z* have high melting points.

3 Elements *X* and *Y* act as catalysts.

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

29 Which of these processes can be used to purify water containing insoluble impurities?

1 chlorination
2 desalination
3 distillation
4 filtration

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

30 Which metal can react rapidly with steam but reacts only **very slowly** with cold water?

A calcium
B copper
C iron
D potassium

31 A hydride is a compound containing **only** two elements, one of which is hydrogen.

Which element can form the greatest number of different hydrides?

A carbon
B chlorine
C nitrogen
D oxygen

32 What is **not** essential for photosynthesis?

A carbon dioxide
B sugar
C light
D water

33 A liquid reacts with each of sodium carbonate, potassium hydroxide and ethanol.

What is the liquid?

A aqueous ammonia
B ethanoic acid
C ethyl ethanoate
D sodium hydroxide

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34 Which compound, on combustion, **never** forms carbon?

A carbon monoxide

B ethanol

C ethene

D methane

35 Which of the following is **not** a condensation polymer?

A nylon

B poly(ethene)

C protein

D *Terylene*

36 Which statement about the properties of propane and hexane is correct?

A Propane has a higher boiling point than hexane.

B Propane has a higher relative molecular mass than hexane.

C Propane has more isomers than hexane.

D Propane is more flammable than hexane.

37 When a volcano erupts, which gas is produced in significant amounts?

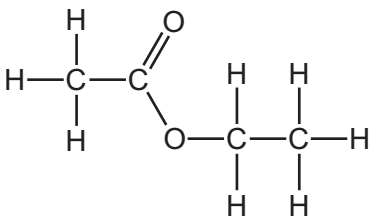
A carbon monoxide

B methane

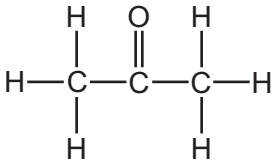
C ozone

D sulfur dioxide

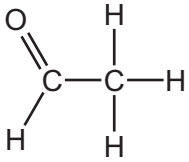
38 Four compounds are shown.



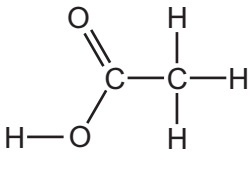
1



2



3



4

Which pair of compounds have the same empirical formula?

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

39 Fats, carbohydrates and proteins all contain which chemical elements?

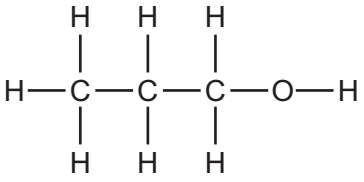
A carbon, hydrogen and oxygen

B carbon, hydrogen and nitrogen

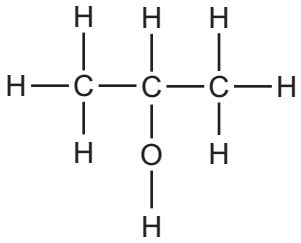
C carbon, hydrogen and sulfur

D carbon, nitrogen and oxygen

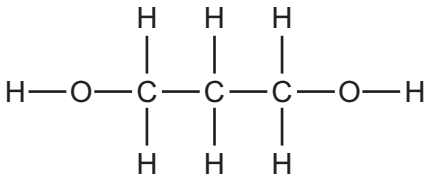
40 The structural formulae of some organic compounds are shown below.



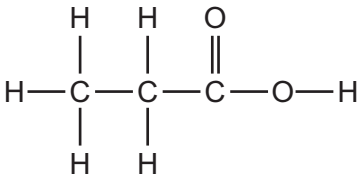
1



2



3



4

Which compounds are alcohols?

A 1 only

B 1 and 2 only

C 1, 2 and 3

D 4

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DATA SHEET
The Periodic Table of the Elements

Group																	
I	II									III	IV	V	VI	VII	0		
															4 He Helium 2		
					1 H Hydrogen 1												
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 = relative atomic mass; X = atomic symbol; b = proton (atomic) number

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

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