

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)

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.







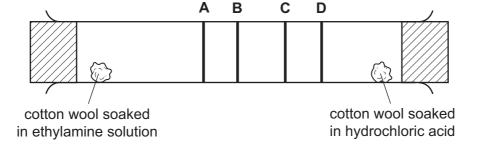
- 1 Which statement is **not** correct?
 - A Air is a mixture.
 - **B** Ammonia is a compound.
 - **C** Methane is a compound.
 - **D** Sea water is a compound.
- 2 A radioactive isotope of carbon has more nucleons than the non-radioactive isotope, ${}^{12}_{6}$ C.

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

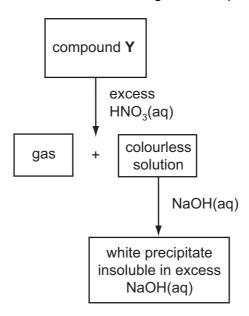
	protons	neutrons	electrons
Α	6	6	6
В	6	8	6
С	8	6	8
D	8	8	8

3 Ethylamine gas, C₂H₅NH₂, 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?



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



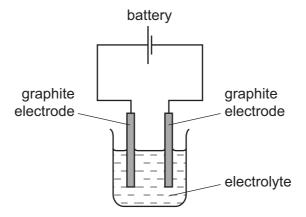
What could the compound **Y** be?

- 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
Α	2, 8, 7	2, 8, 8	2, 8, 1
В	2, 1	2, 8, 1	2, 8, 8, 1
С	2, 2	2, 3	2, 4
D	2, 8, 1	2, 8, 2	2, 8, 3

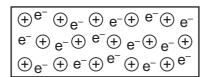
- 6 Which molecule has the largest number of electrons involved in covalent bonds?
 - $A C_2H_4$
- B CO₂
- C CH₃OH
- $D N_2$

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%

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

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

Which words correctly complete gaps X, Y and Z?

	Х	Y	Z
Α	oxidised	brown	colourless
В	oxidised	colourless	brown
С	reduced	brown	colourless
D	reduced	colourless	brown

12 V	Vhich element	is most likel	y to be used as	an industrial	catalyst?
-------------	---------------	----------------------	-----------------	---------------	-----------

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

13 Which solution containing one mole per dm³ 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?

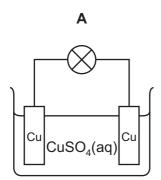
- A A basic oxide is an oxide of a non-metal.
- **B** Acidic oxides contain ionic bonds.
- **C** An amphoteric oxide contains a metal.
- **D** Basic oxides are always gases.

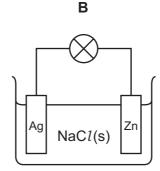
15 Bitumen, diesel, naphtha and paraffin (kerosene) are all fractions obtained by the fractional distillation of petroleum.

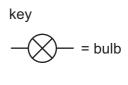
Which row gives a correct use for the named fraction?

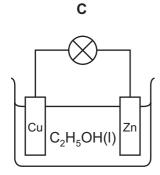
	fraction	use
Α	bitumen	a source of polish
В	diesel	a fuel for aircraft engines
С	naphtha	a fuel for heating
D	paraffin	a fuel for cooking

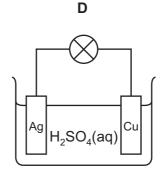
16 In which circuit does the bulb light?











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.

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	Υ

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

	W	X	Y
Α	-34	1083	445
В	-34	1083	2887
С	-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.

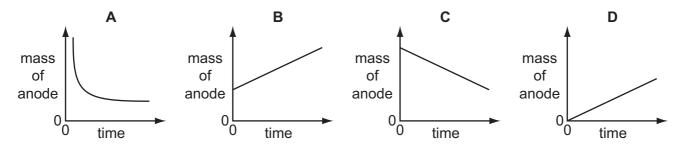
$$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$$
 $\Delta H = -92 \text{ kJ/mol}$

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.

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 the1..... and it can be deduced that aluminium is2..... sodium in the reactivity series.

Which words correctly complete gaps 1 and 2?

	1	2
Α	+ve electrode	above
В	+ve electrode	below
С	-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**?

	Υ	Z
Α	hydrochloric acid	silver nitrate
В	hydrochloric acid	sodium nitrate
С	sodium chloride	lead(II) nitrate
D	sodium chloride	silver nitrate

										,	,										
25	Wh	ich prope	rty w	ould	l al	I the	hydro	gen	com	ιροι	unds	s of t	the	Gro	up	VII e	elen	nent	s po	ssess	?
	Α	be coval	ent																		
	В	be solids	pe solids at room temperature																		
	С	form alka	form alkaline aqueous solutions																		
	D	conduct	elect	ricit	y w	hen	molte	en													
26	Wh	ich particl	e is f	oun	ıd iı	n iodi	ine va	apou	r?												
	Α	I		E	3	I^-			С	ľ	+			ı	D	I_2					
27	Wh A B C D	at sugges M has a M is hard M product M product	bright and ces a	nt, si I diff nn al	ilve ficu Ikal	ery ap ult to line s	opear cut. solutio	ance	and	d is	a go acts	ood o	cond h wa	duct	or		ectr	ricity	′ .		
28	The	e diagram		ws a	in c	outlin	e of p	part o	of the	e Pe	Y	lic T	able	Э.				Z			

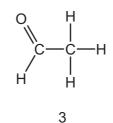
Which statements are correct?

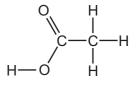
- 1 Elements *W*, *X* and *Y* form coloured compounds.
- 2 Elements *X*, *Y* and *Z* have high melting points.
- 3 Elements X and Y act as catalysts.
- **A** 1 only **B** 2 only **C** 3 only **D** 1 and 3 only

29	Wh	hich of these processes can be used to purify water containing insoluble impurities?										
		1	chlorination	on								
		2	desalinati	on								
		3	distillation	l								
		4	filtration									
	Α	1 and 2	В	2 and 3	С	3 and 4	D	4 only				
30	Wh	ich meta	l can react	rapidly with s	team bu	ıt reacts onl	y very sl	owly with cold water?				
	Α	calcium										
	В	copper										
	С	iron										
	D	potassiu	ım									
31	A h	ydride is	a compou	nd containing	only tw	o elements	, one of v	vhich is hydrogen.				
	Wh	ich eleme	ent can for	m the greates	t numbe	er of differer	nt hydride	es?				
	A	carbon										
	В	chlorine	:									
	С	nitroger	ı									
	D	oxygen										
32	Wh	at is not	essential f	or photosynth	esis?							
	A	carbon	dioxide									
	В	sugar										
	С	light										
	D	water										
33	A li	quid reac	cts with eac	ch of sodium o	carbona	te, potassiu	m hydrox	kide and ethanol.				
	Wh	at is the	liquid?									
	Α	aqueou	s ammonia	l								
	В	ethanoi	c acid									
	С	ethyl eth	nanoate									
	D	sodium	hydroxide									

- 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.

2



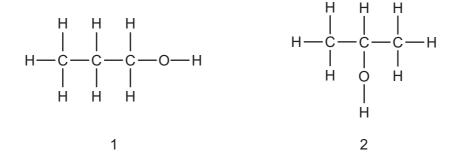


Which pair of compounds have the same empirical formula?

- **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.



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

	0	4 He Helium	20 Neon 10 40	Ar Argon	88 X	Krypton 36	131	Xenon 54	R	Radon 86		175 Lu Lutetium 71	-	Lawrencium 103
	IIA		19 Fluorine 9 35.5	Ct Chlorine		m	l	lodine 53	¥	Astatine 85		173 Yb Ytterbium 70		Nobelium 102
	IN		16 Oxygen 8	Sulfur 16		=	l .	Tellurium 52				169 Tm Thulium 69		Mendelevium 101
	^		14 Nitrogen 7	P Phosphorus 15			l	Antimony 51	209 D	ے		167 Er Erbium 68	2	Fermium 100
	ΛΙ		12 Carbon 6	Silicon	ي ۶	E	119	Tin 20	207 Pb	Lead 82		165 Ho Holmium 67		n Einsteinium 99
	III		11 Boron 5	A1 Auminium 13	۶ ر		115	Indium 49	204 T 1	Thallium 81		162 Dy Dysprosium 66		Californium 98
					65	Zinc 30	112	Cadmium 48	201 Ha	Mercury 80		159 Tb Terbium 65	à	Berkelium 97
					⁵ 6	Copper 29	108	Silver 47	197 Au	Gold 79		157 Gd Gadolinium 64		Curium 96
Group					26 2		106	Palladium 46	195 T	Platinum 78		152 Eu Europium 63		Americium 95
Gre					و و	Cobalt 27	103	Rhodium 45	192 I r	Iridium 77		150 Sm Samarium 62	Dii	Plutonium 94
	T Hydrogen			26 T	Iron 26	101	Ruthenium 44	190 Os	Osmium 76		Pm Promethium 61	S N	Neptunium 93	
					55 M	2≥ ≤		Technetium 43	186 Re	Rhenium 75		144 Nd Neodymium 60	238	Uranium 92
					ن 25	Chromium 24	96	Molybdenum 42	¹⁸	Tungsten 74		141 Pr Praseodymium 59	G	Protactinium 91
					55 >	Vanadium 23		Niobium 41	181 E	Tantalum 73		140 Ce Cerium	232 T	_
					48	Titanium 22	91	Zirconium 40	178 ‡	Hafnium 72			nic mass	nic) number
					45	Scandium 21	88 >	T Yttrium 39	139 La	Lanthanum 57 *	Actinium + 89	l series eries	a = relative atomic mass	b = proton (atomic) number
	=		9 Beryllium 4	Magnesium	٥ و	Calcium 20	88	Strontium 38	137 Ba	Barium 56	226 Ra Radium 88	*58-71 Lanthanoid series 190-103 Actinoid series	a >	
	_		Lithium 3 23	Na Sodium	® ¥	Potassium 19	85	Rubidium 37	133 CS	Caesium 55	Francium 87	*58-71 L 190-103		d d

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

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