Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CHEMISTRY **0620/11**

Paper 1 Multiple Choice (Core) **October/November 2018**

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 **16** printed pages.

1 A beaker containing solid carbon dioxide is placed in a fume cupboard at room temperature. The carbon dioxide becomes gaseous.

Which process describes this change of state?

A boiling

B condensation

C evaporation

D sublimation

2 The pressure of a sample of gas is decreased. The temperature is kept constant.

Which row describes the effects on the particles?

	movement of particles	collisions between particles
A	slower	occur less often
B	slower	occur with more force
C	no change in speed	occur less often
D	no change in speed	occur with more force

3 Which statement about paper chromatography is correct?

A A solvent is needed to dissolve the paper.

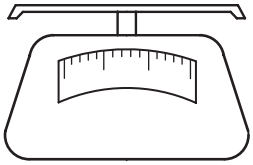
B Paper chromatography separates mixtures of solvents.

C The solvent should cover the baseline.

D The baseline should be drawn in pencil.

4 The diagrams show four pieces of laboratory equipment.

balance



pipette

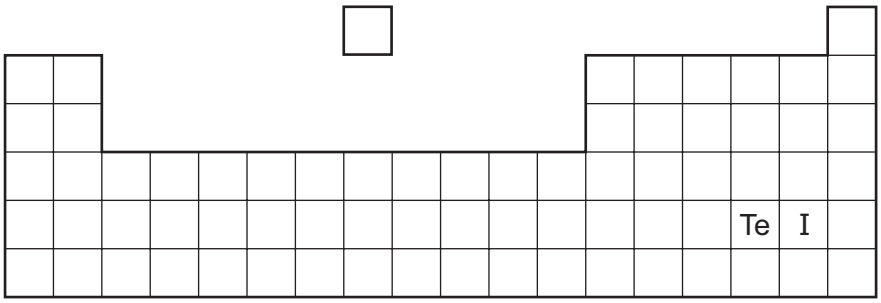
stop-clock

thermometer

Which equipment is essential to find out if dissolving a salt in water is an exothermic process?

	balance	pipette	stop-clock	thermometer
A	✗	✗	✗	✓
B	✓	✗	✗	✓
C	✗	✓	✗	✓
D	✓	✗	✓	✗

5 Iodine, I, has a lower relative atomic mass than tellurium, Te, but is placed after it in the Periodic Table.



Which statement explains why iodine is placed after tellurium in the Periodic Table?

A Iodine has fewer neutrons than tellurium.

B Iodine has fewer protons than tellurium.

C Iodine has more neutrons than tellurium.

D Iodine has more protons than tellurium.

[Turn over

6 Substance Q has a high melting point and conducts electricity both when molten and when dissolved in water.

What is Q?

A calcium chloride

B diamond

C iron

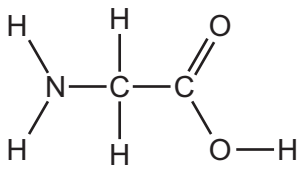
D silver chloride

7 Elements X and Y form an ionic compound, XY.

In which group of the Periodic Table is X found and how is the bond between X and Y formed?

	group in which X is found	how the bond between X and Y is formed
A	I	by X gaining one electron from Y
B	I	by X transferring one electron to Y
C	VII	by X sharing electrons with Y
D	VII	by X transferring one electron to Y

8 The structure of glycine is shown.



Which row is correct?

	formula of glycine	number of different elements in glycine
A	CH_5O_2N	10
B	$C_2H_5O_2N$	4
C	$C_2H_5O_2N$	10
D	$H_2NCHCOOH$	4

9 Calcium phosphate forms when calcium chloride and sodium phosphate solutions react together.

$$x\,CaCl_2 + y\,Na_3PO_4 \rightarrow 2Ca_3(PO_4)_2 + 12NaCl$$

Which values of *x* and *y* balance the equation?

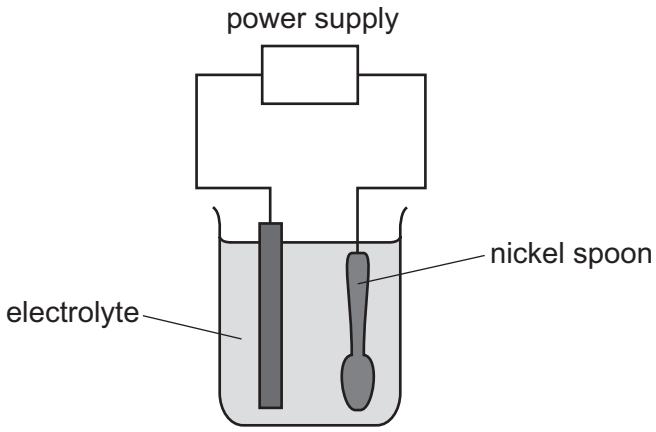
	x	*y*
A	2	2
B	3	4
C	6	3
D	6	4

10 During the electrolysis of concentrated aqueous sodium chloride, chlorine gas is produced at the positive electrode.

What happens at the negative electrode and to the solution?

	product at the negative electrode	the solution becomes
A	hydrogen	acidic
B	hydrogen	alkaline
C	sodium	acidic
D	sodium	alkaline

11 The diagram shows an experiment to electroplate a nickel spoon with silver.



Which row correctly describes the positive electrode, the negative electrode and the electrolyte?

	positive electrode	negative electrode	electrolyte
A	nickel spoon	pure nickel	silver nitrate solution
B	nickel spoon	pure silver	nickel nitrate solution
C	pure nickel	nickel spoon	silver nitrate solution
D	pure silver	nickel spoon	silver nitrate solution

12 Which substance does **not** use oxygen to produce heat energy?

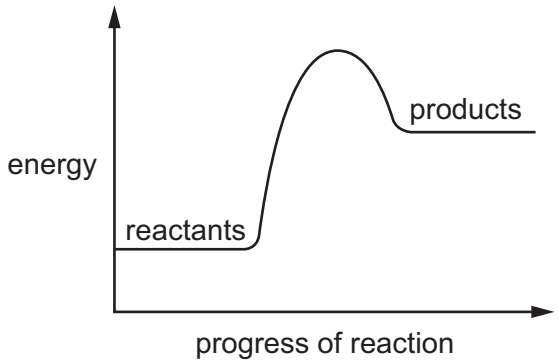
A coal

B hydrogen

C natural gas

D uranium

13 An energy level diagram for a reaction is shown.



Which statement about the reaction is correct?

A Heat is released.

B It is a combustion reaction.

C It is an endothermic reaction.

D The temperature increases.

14 Two reactions are done.

1 Hydrated cobalt(II) chloride is heated. It changes colour.

2 Water is added to the product of reaction 1. It becomes hotter. The original colour is produced.

Which types of reaction have occurred in reactions 1 and 2?

	endothermic	exothermic	neutralisation	reversible
A	✓	✓	✓	✓
B	✓	✓	✓	✗
C	✓	✓	✗	✓
D	✓	✗	✗	✓

15 Which equation shows reduction of an iron compound?

A $4Fe + 3O_2 \rightarrow 2Fe_2O_3$

B $Fe + 2HCl \rightarrow FeCl_2 + H_2$

C $4FeO + O_2 \rightarrow 2Fe_2O_3$

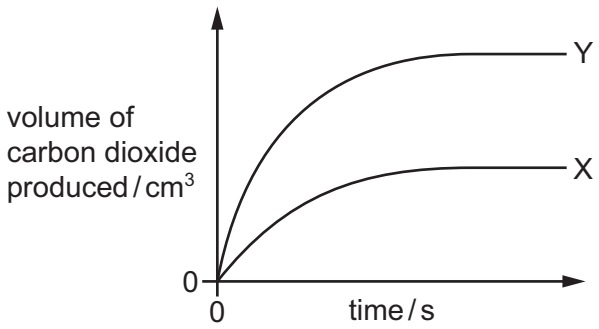
D $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

16 Calcium carbonate reacts with dilute hydrochloric acid to make carbon dioxide gas. Graph X shows the results of this experiment.

The particle size of the calcium carbonate is increased and the experiment is repeated. All other conditions are kept the same. Graph Y shows the results of this experiment.

Which diagram is correct for the two experiments?

A



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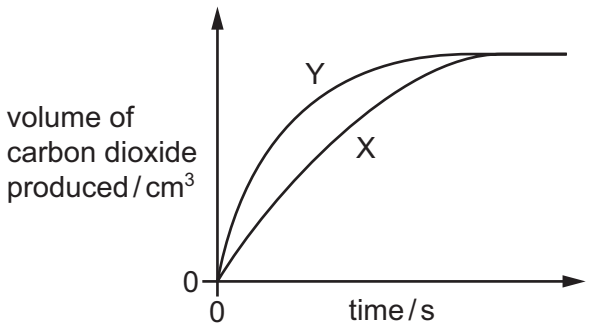
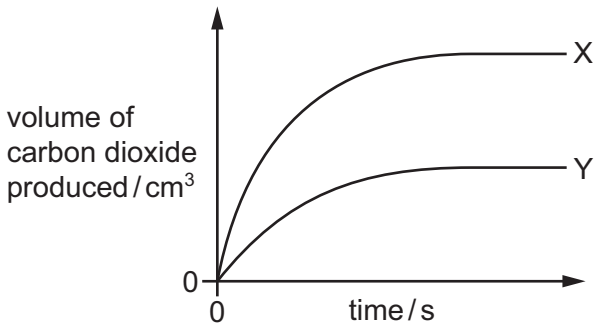
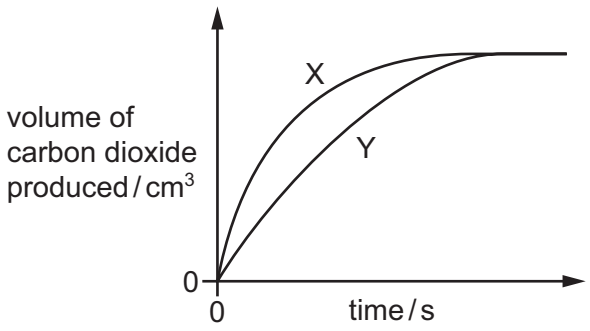


C

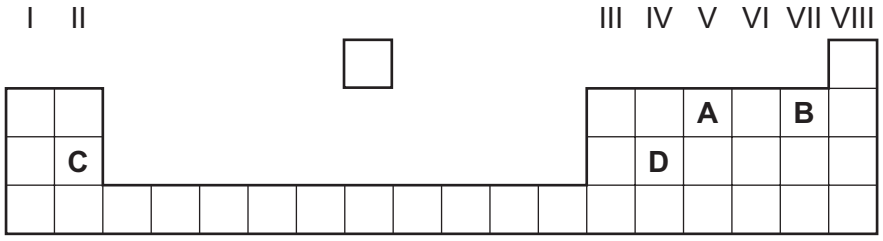


D



17 Part of the Periodic Table is shown.

Which element forms an oxide that reacts with dilute acid to form a salt and water?



18 An excess of substance Z is added to some spilt acid.

The solution produced as a result is neutral.

What is Z?

A aqueous ammonia

B aqueous sodium hydroxide

C calcium carbonate

D water

19 Aqueous sodium hydroxide is added to solid Q in a test-tube.

A gas is produced which turns damp red litmus blue.

What is Q?

A aluminium

B ammonia

C ammonium chloride

D sodium nitrate

20 Potassium hydroxide is a base.

Which statement describes a reaction of potassium hydroxide?

A Chlorine is formed when it is heated with ammonium chloride.

B It turns Universal Indicator green.

C It reacts with an acid to produce a salt and water.

D It turns methyl orange red.

21 Which statement about the Periodic Table is **not** correct?

A It can be used to find the atomic number of an element.

B It can be used to find the physical state of an element.

C It can be used to find the symbol of an element.

D It can be used to predict the properties of an element.

[Turn over

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 equation shows the reaction between a halogen and aqueous bromide ions.

$$X_2 + 2Br^- \rightarrow 2X^- + Br_2$$

.....1..... .....2..... .....3.....

Which words complete gaps 1, 2 and 3?

	1	2	3
A	chlorine	brown	colourless
B	chlorine	colourless	brown
C	iodine	brown	colourless
D	iodine	colourless	brown

24 An inert gas R is used to fill weather balloons.

Which descriptions of R are correct?

	number of outer shell electrons in atoms of R	structure of gas R
A	2	diatomic molecules
B	2	single atoms
C	8	diatomic molecules
D	8	single atoms

25 Metal X reacts with steam but not with cold water.

What is X?

A calcium

B copper

C sodium

D zinc

26 Which process is used to extract aluminium from bauxite?

A heating bauxite in air

B heating bauxite with carbon

C heating bauxite with hydrogen

D passing electricity through purified bauxite

27 Which row shows uses of the metals listed?

	aluminium	copper	mild steel
A	aircraft manufacture	food containers	cutlery
B	cutlery	electrical wiring	chemical plant
C	electrical wiring	aircraft manufacture	cooking utensils
D	food containers	cooking utensils	car bodies

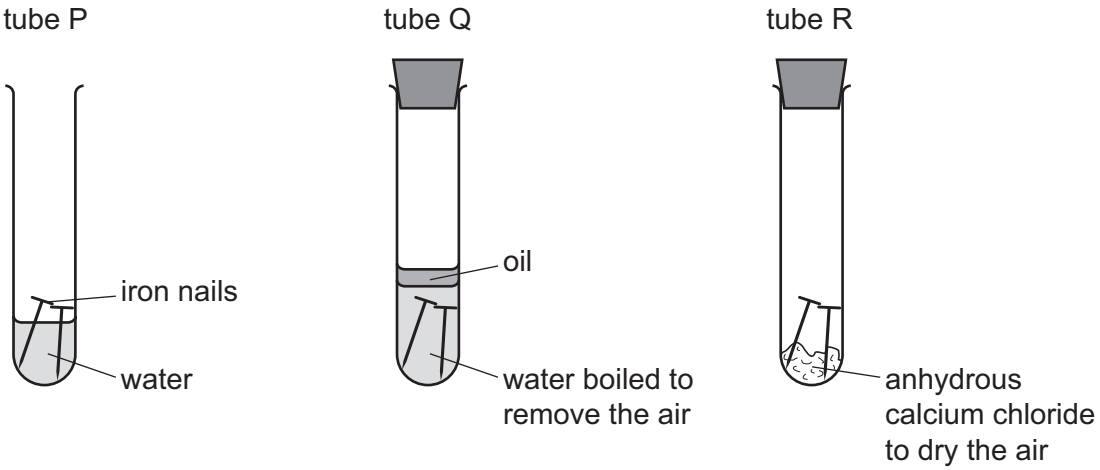
28 Argon is a noble gas used to fill light bulbs.

What is the approximate percentage of argon in air?

A 1% **B** 20% **C** 79% **D** 99%

[Turn over

29 The diagrams show experiments involving the rusting of iron.



A student predicted the following results.

1 In tube P, the iron nails rust.

2 In tube Q, the iron nails do not rust.

3 In tube R, the iron nails do not rust.

Which predictions are correct?

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

30 Which statement about air pollutants is **not** correct?

A Carbon monoxide is formed from the complete combustion of petroleum.

B Lead compounds are formed from some types of petrol.

C Oxides of nitrogen are formed from the combustion reactions inside car engines.

D Sulfur dioxide is formed from the combustion of coal.

31 The table describes three types of water.

water type	source of water	appearance before treatment	treatment	appearance after treatment
P	river	muddy	none	muddy
Q	river	muddy	filtration and chlorination	clear
R	well	clear	chlorination only	clear

Which statement is correct?

A Only Q and R are suitable for drinking, while P could be used for irrigation.

B Only Q and R are suitable for drinking, while P is unsuitable for any purpose.

C Only Q is suitable for drinking. R could be used for washing cars and P for irrigation.

D P, Q and R are suitable for irrigation and washing cars, but are not suitable for drinking.

32 Which compound would **not** be used as an important part of a garden fertiliser?

A $Ca_3(PO_4)_2$ **B** KNO_3 **C** $Mg(OH)_2$ **D** $(NH_4)_2SO_4$

33 Carbon dioxide and methane both contribute to climate change.

Which process produces both gases?

A complete combustion of natural gas

B farming cattle

C heating calcium carbonate

D respiration

34 Which reaction is endothermic?

A $CaCO_3 \rightarrow CaO + CO_2$

B $CaO + 2HCl \rightarrow CaCl_2 + H_2O$

C $2Ca + O_2 \rightarrow 2CaO$

D $Ca + 2HCl \rightarrow CaCl_2 + H_2$

35 Petroleum is a mixture of different hydrocarbons.

Which process is used to separate the petroleum into groups of similar hydrocarbons?

A combustion

B cracking

C fractional distillation

D reduction

36 Which two compounds are molecules which both contain a double bond?

A ethane and ethanoic acid

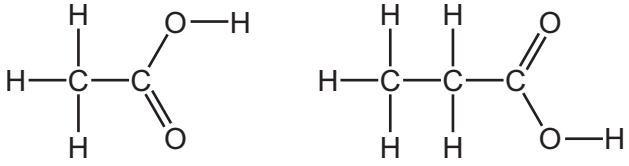
B ethane and ethanol

C ethene and ethanoic acid

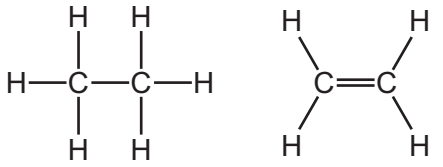
D ethene and ethanol

37 Which pair of diagrams shows compounds belonging to the same homologous series?

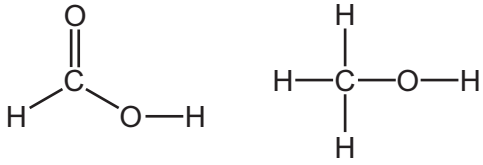
A



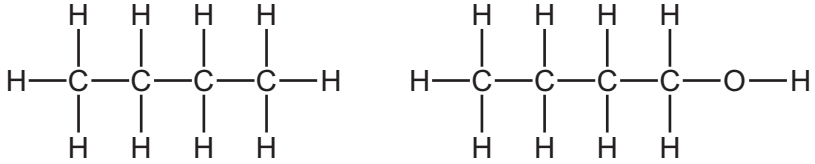
B



C



D



38 Ethanol can be formed by:

1 fermentation

2 reaction between steam and ethene.

Which of these processes use a catalyst?

	1	2
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

39 Which statement about ethanoic acid is correct?

A It fizzes with magnesium ribbon.

B It forms a salt with hydrochloric acid.

C It is a hydrocarbon.

D It forms a solution in water with a pH greater than pH 7.

40 Which statement about *Terylene* is correct?

A It is a form of protein.

B It is a natural polymer.

C It is also called poly(ethene).

D It is used to make clothes.

The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium –	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89–103 actinoids	104 Rf rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

Key

atomic number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

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