Write your name here		
Surname	Other n	ames
Edexcel GCSE	Centre Number	Candidate Number
Chemistry Unit C1: Chemistry		:e
		Higher Tier
Wednesday 9 November		Paper Reference
Time: 1 hour		5CH1H/01

Instructions

- Use **black** ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided
 - there may be more space than you need.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
 - use this as a guide as to how much time to spend on each question.
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
 - you should take particular care with your spelling, punctuation and grammar, as well as the clarity of expression, on these questions.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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		1					
	0 4 He helium	20 Neon 10	40 Ar argon 18	84 Kr krypton 36	131 Xe xenon 54	[222] Rn radon 86	fully
	_	19 fluorine 9	35.5 CI chlorine 17	80 Br bromine 35	127 	[210] At astatine 85	orted but not
	9	16 0 0 8	32 S sulfur 16	79 Se selenium 34	128 Te tellurium 52	[209] Po polonium 84	ave been rep
	Ŋ	14 N nitrogen 7	31 P phosphorus 15	75 As arsenic 33	122 Sb antimony 51	209 Bi bismuth 83	s 112-116 ha authenticated
S	4	12 carbon 6	28 Si silion 14	73 Ge germanium 32	119 Sn tin 50	207 Pb lead 82	Elements with atomic numbers 112-116 have been reported but not fully authenticated
nent	ო	11 boron 5	27 Al aluminium 13	70 Ga gallium 31	115 In indium 49	204 TI thallium 81	ents with atc
iodic Table of the Elements				65 Zn zinc 30	112 Cd cadmium 48	201 Hg mercury 80	Elerr
the				63.5 Cu copper 29	108 Ag silver 47	197 Au gold 79	Rg roentgenium 111
e of				59 Ni rickel 28	106 Pd palladium 46	195 Pt platinum 78	[271] Ds damstadium 110
Tabl		_		59 Co cobalt 27	103 Rh rhodium 45	192 Ir iridium 77	[268] Mt meinerium 109
odic	T hydrogen			56 Fe iron 26	101 Ru ruthenium 44	190 0s osmium 76	[277] Hs hassium 108
				55 Mn manganese 25	[98] Tc technetium 43	186 Re rhenium 75	[264] Bh bohrium 107
The Per		mass ɔol ıumber		52 Cr chromium 24	96 Mo molybdenum 42	184 W tungsten 74	[266] Sg seaborgium 106
	Kev	relative atomic mass atomic symbol name atomic (proton) number		51 V vanadium 23	93 Nb niobium 41	181 Ta tantalum 73	[262] Db dubnium 105
		relati ⁿ atc atomic		48 Ti titanium 22	91 Zr zirconium 40	178 Hf hafnium 72	[261] Rf rutherfordium 104
				45 Sc scandium 21	89 Y yttrium 39	139 La * lanthanum 57	[227] Ac* actinium 89
	7	9 Be beryllium 4	24 Mg magnesium 12	40 Ca calcium 20	88 Sr strontium 38	137 Ba barium 56	[226] Ra radium 88
	-	7 Li lithium 3	23 Na sodium 11	39 K potassium 19	85 Rb rubidium 37	133 Cs caesium 55	[223] Fr francium 87

* The lanthanoids (atomic numbers 58-71) and the actinoids (atomic numbers 90-103) have been omitted.

The relative atomic masses of copper and chlorine have not been rounded to the nearest whole number.

2



Answer ALL questions.

Some questions must be answered with a cross in a box \boxtimes . If you change your mind about an answer, put a line through the box \boxtimes and then mark your new answer with a cross \boxtimes .

Coins

1 Modern European coins contain mixtures of metals. The 1 cent and 1 euro coins are shown.



inner, silver-coloured centre, made of alloy containing copper and nickel

made of steel, coated with copper

1 cent coin

1 euro coin

outer, gold-coloured rim, made of alloy containing copper, zinc and nickel

(a) (i) Suggest why the 1 cent coin is coated with copper.

(1)

(ii) The 1 euro coin has a silver-coloured centre and a gold-coloured rim.

Compare the compositions of the two parts of the coin to suggest which metal causes the alloy to become gold-coloured.

(1)

4



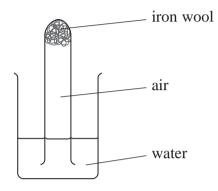
	pure metal	alloy	
Use these o	liagrams to help you explain w	by alloying increases the strength of the	ne.
oure metal.		,,,,	
			(3)
(i) Compi	and iron are both extracted from lete the sentence by putting a conservation sextracted from its oxide by he approcess the iron oxide is	cross (☒) in the box next to your answer	er.
			(1)
	rmally decomposed		
B oxi			
	utralised		
D red			
	nium cannot be extracted from olysis must be used.	its oxide by heating the oxide with ca	rbon.
	in why electrolysis must be use	ed to extract aluminium from its oxide.	(2)
Explai			
Explai			

The atmosphere

2 (a) Iron reacts with oxygen to form iron oxide.

Iron wool was placed in the bottom of a wet test tube.

The test tube was then put in a beaker of water as shown in the diagram.



After some time the water level in the test tube rose and some of the iron wool had formed iron oxide.

(i) Write the word equation for the reaction of iron with oxygen.

(1)

(ii) Explain why the water level in the test tube rose during the experiment.

(2)

(iii) The volume of air in the test tube at the start of the reaction was 10 cm³.

Calculate the volume of gas that should be present in the test tube at the end of the reaction.

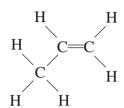
(2)

answer =

(iv) Complete the sentence by putting a cross (⋈) in the box next to your answer.
Most of the gas remaining in the test tube at the end of the experiment would be
(1)
□ A argon
■ B carbon dioxide
C nitrogen
D oxygen
(b) Savaral processes abongs the composition of the Earth's atmosphere
(b) Several processes change the composition of the Earth's atmosphere.
Explain how the use of fossil fuels affects the composition of the atmosphere.
(Total for Question 2 = 8 marks)

Propene

3 The diagram shows the structure of a propene molecule.



(a) Which row of the table describes propene?

Put a cross (\boxtimes) in the box next to your answer.

(1)

	hydrocarbon	unsaturated
⋈ A	yes	no
⋈ B	no	yes
⋈ C	yes	yes
⋈ D	no	no

(b) Propene can form the polymer poly(propene).

Draw a diagram to show the part of a poly(propene) molecule formed from two propene molecules.

(2)

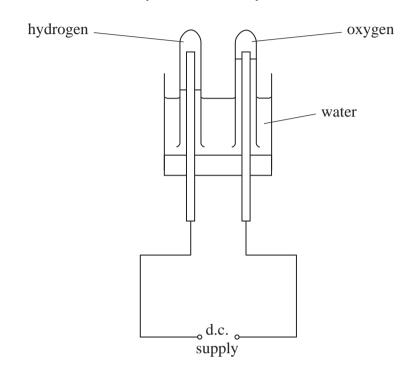
c) Describe a test that shows that molecules of propene contain carbon to carbon do bonds.	
	(2)
d) Propene can be made by cracking fractions obtained from crude oil.	
(i) This equation shows the cracking of decane to produce propene and butane.	
$C_{10}H_{22} \rightarrow 2C_3H_6 + C_4H_{10}$ decane propene butane	
Give the total mass of products formed if 17 g of decane is cracked in this wa	
	(1)
(ii) Explain what is meant by cracking .	(2)
(iii) Explain why it is necessary to crack crude oil fractions that contain large	
molecules.	(2)
	(-)
(Total for Question 3 = 10 r	narks)

Useful liquids

4 (a) Water can be decomposed by electrolysis.

Hydrogen and oxygen are formed.

This apparatus can be used to carry out the electrolysis.



(i) Write the balanced equation for water decomposing to form hydrogen and oxygen.

(3)

(ii) Describe the test to show that a gas is hydrogen.

(2)

(iii) Describe the test to show that a gas is oxygen.

(2)



(b) Seawater can also be decomposed using electrolysis. Seawater is sodium chloride solution.	
When this is decomposed one product is a toxic gas.	
(i) Complete the sentence by putting a cross (☒) in the box next to your answer.	
The toxic gas produced is	(1)
■ A hydrogen	(1)
☑ B chlorine	
C oxygen	
■ D carbon monoxide	
(ii) Give a safety precaution that should be taken when collecting this toxic gas.	(1)
(c) Sodium chloride solution can be prepared by reacting sodium hydroxide solution	
with an acid.	
Give the name of the acid that must be used.	(1)
(Total for Question 4 = 10 ma	arks)

Limestone

5 The photograph shows a limestone cliff face.



(a)	What is formed from limestone when it is subjected to heat and pressure?	
	Put a cross (⋈) in the box next to your answer.	
		(1

A	chalk
\boldsymbol{A}	CHAIR

X	В	granite
()	D	grannu

(b) Large quantities of limestone are extracted from quarries.

Give an advantage and a disadvantage, to local communities, of a nearby limestone quarry.

(2)

advantage

disadvantage





(c) Limestone is a natural form of calcium carbonate. Limewater is calcium hydroxide solution.	
Describe how limewater can be made from calcium carbonate.	(3)
*(d) Limestone is a sedimentary rock.	
The limestone shown in the photograph was originally formed beneath the sea and	
then earth movements forced the rock upwards to form the cliff.	
Describe how the limestone was originally formed and has become the cliff face	
shown in the photograph.	(6)
(Total for Question 5 = 12 ma	rks)



Fuels

6 The photograph shows a multifuel camping stove designed to use various fuels.

This stove can burn the hydrocarbon fuels, propane gas, petrol, kerosene or diesel.



(a) Suggest **two** reasons why it is usually difficult to burn different hydrocarbon fuels efficiently in the same appliance.

reason 1

(2)

(b) The fuels that can be used in the stove are obtained by the fractional distillation of crude oil.

Which of these statements about the fractions obtained by the fractional distillation of crude oil is correct?

Put a cross (\boxtimes) in the box next to your answer.

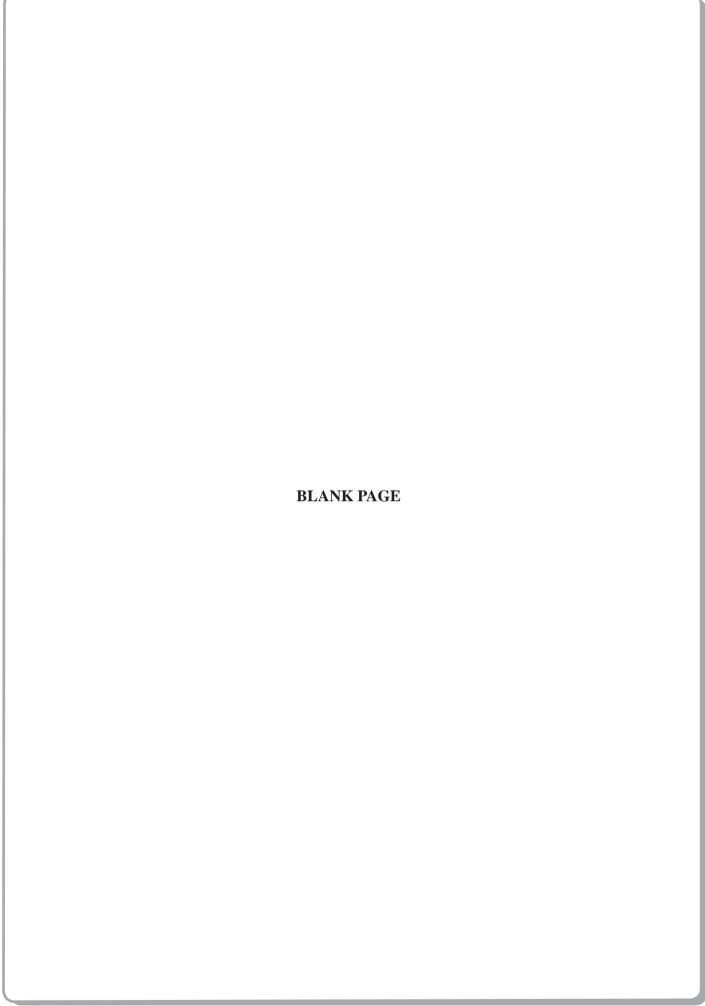
(1)

- A each fraction is a pure substance
- **B** fuel oil is used as fuel for cars
- C diesel oil is used as a fuel for some trains
- **D** some fractions are biofuels



Research is being carried out into the use of hydrogen instead of petrol. Evaluate the advantages and disadvantages of using hydrogen rather than petrol as a fuel for cars. (6)		(Total for Question 6 = 12 marks)
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Evaluate the advantages and disadvantages of using hydrogen rather than petrol as a	fuel for cars.	(6)





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