Centre No.						Paper	r Refe	rence ((compl	ete be	low)		Surname		Initial(s)
Candidate No.									H	/	1	H	Signature		
		-	r Reference	(s) LT / 1	П	4	5 03	QL	I/1	П				Exami	ner's use only

5018H/1H 5038H/1H **Edexcel GCSE**

Additional Science (5018H)

Chemistry (5038H)

C2 – Topics 5 to 8

Higher Tier

Monday 10 March 2008 – Morning

Time: 30 minutes

Materials	required	for	examination
Calculator			•

Items included with question papers

Instructions	ťΩ	Candid	atos

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature, and complete the paper reference.

Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper. Do not use pencil. Use blue or black ink.

Show all stages in any calculations and state the units. Calculators may be used.

Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2). There are 5 questions in this question paper. The total mark for this paper is 30.

There are 8 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

You are reminded of the importance of clear English and careful presentation in your answers.

his publication may be reproduced only in accordance with dexcel Limited copyright policy. \$2008 Edexcel Limited.

N33029A W850/R1536/57570 6/5/4/4/2/12,100



Turn over



Team Leader's use only

Question Number

1

2

3

5

Total

0	Heliur	20 Ne	40 Ar	84 kryptr 36	13. Xens xens 74.	[22] Rr rado	fully
_		19 F fluorine 9	35.5 CI chlorine 17	80 Br bromine 35	127 	[210] At astatine 85	Elements with atomic numbers 112-116 have been reported but not fully authenticated
9		16 O oxygen 8	32 S sulfur 16	79 Se selenium 34	128 Te tellurium 52	[209] Po polonium 84	ave been rep
2		14 N nitrogen 7	31 P phosphorus 15	75 As arsenic 33	122 Sb antimony 51	209 Bi bismuth 83	rs 112-116 hav authenticated
4		12 C carbon 6	28 Si silicon 14	73 Ge germanium 32	119 Sn tin 50	207 Pb lead 82	omic number
က		11 boron 5	27 AI aluminium 13	70 Ga gallium 31	115 In indium 49	204 TI thallium 81	nents with at
				65 Zn zinc 30	112 Cd cadmium 48	201 Hg mercury 80	Elen
				63.5 Cu copper 29	108 Ag silver 47	197 Au gold 79	[272] Rg roentgenium 1111
				59 nickel 28	106 Pd palladium 46	195 Pt platinum 78	[271] Ds damstadtium 110
				59 Co cobalt 27	103 Rh rhodium 45	192 Ir iridium 77	[268] Mt meitnerium 109
	1 X hydrogen			56 iron 26	Ru ruthenium 44	190 Os osmium 76	[277] Hs hassium 108
			•	55 Mn manganese 25	[98] Tc technetium 43	186 Re rhenium 75	[264] Bh bohrium 107
		mass bol number		52 Cr chromium 24	96 Mo molybdenum 42	184 W tungsten 74	[266] Sg seaborgium 106
	Key	ve atomic omic sym name : (proton) r		51 V vanadium 23	93 Nb niobium 41	181 Ta tantalum 73	[262] Db dubnium 105
		relati at o atomic		48 Ti ttanium 22	91 Zr zirconium 40	178 Hf hafnium 72	[261] Rf rutherfordium 104
	į			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	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
	3 4 5 6 7	1	2 Key Key Telative atomic mass atomic (proton) number atomic (pro	2 1	This contains to the standard sandard teaching that the standard standard teaching that the standard	The control of the	1

84 **\$** 38

131 xenon 54

Rn radon 86

20 **Ne** 10

A argon 18

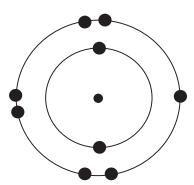
* The lanthanoids (atomic numbers 58-71) and the actinoids (atomic numbers 90-103) have been omitted.

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



		Lea blar
1.	Chemists produce many useful substances, including fuels and plastics, from crude of The amount of crude oil in the Earth's crust is limited.	oil.
	(source: http://www.castlereagh.gov.uk)	
	Explain why burying plastic waste in landfill sites may cause a problem in years come.	to
	(b) What problems may occur when crude oil supplies begin to run out?	
		(2) Q1
	(Total 4 mark	(s)

2. (a) An atom consists of a nucleus with electrons in shells around the nucleus. A diagram of an atom of fluorine is shown.



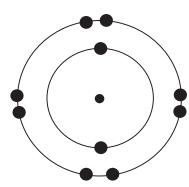
(i) Write down the electronic configuration of an atom of **chlorine**.

(1)

(ii) What evidence is there in the diagram and in your answer to (i) that both fluorine and chlorine are in the same group?

(1)

(b) A diagram of an atom of neon is shown.



Use this diagram to explain why neon is very unreactive.

	(2)

(c) An atom of an element has 24 electrons, 28 neutrons and 24 protons.

(i) What is the mass number of this atom?

 $(1) \quad \boxed{\mathbf{Q2}}$

(Total 6 marks)

(2) (b) Manna repeated the experiment using warmer acid. He found that the reaction was faster. Explain, in terms of particles, why the reaction was faster. ———————————————————————————————————	(a) Balance the equa					
He found that the reaction was faster. Explain, in terms of particles, why the reaction was faster. (3) (c) Suggest one way in which Manna could have measured the rate of this reaction.	CaCO ₃ () +	$HCl() \rightarrow$	CaCl ₂ (aq) +	$CO_2() +$	$H_2O(\ldots)$	(2)
(c) Suggest one way in which Manna could have measured the rate of this reaction. (1)	He found that the	e reaction was fa	aster.			
(c) Suggest one way in which Manna could have measured the rate of this reaction. (1)						
(c) Suggest one way in which Manna could have measured the rate of this reaction. (1)						
(c) Suggest one way in which Manna could have measured the rate of this reaction. (1)						
(c) Suggest one way in which Manna could have measured the rate of this reaction. (1)						(3)
	(c) Suggest one way	in which Mann	a could have me	easured the rate of	f this reaction.	
(Total 6 marks)						
						(1)
					(Total 6 ma	
					(Total 6 ma	
					(Total 6 ma	
					(Total 6 ma	

In v	water molecules, atoms are covalently bonded together.
(a)	Draw a dot and cross diagram of a molecule of water.
	(2
(b)	Diamond has a giant molecular covalent structure. The melting point of diamond is much higher than the melting point of water. Explain why.
	(2
(c)	Hydrogen can be used as a fuel for spacecraft. The equation for the combustion of hydrogen is
(c)	Hydrogen can be used as a fuel for spacecraft.
(c)	Hydrogen can be used as a fuel for spacecraft. The equation for the combustion of hydrogen is
(c)	Hydrogen can be used as a fuel for spacecraft. The equation for the combustion of hydrogen is $2H_2 + O_2 \rightarrow 2H_2O$ Calculate the maximum mass of water that can be formed from the combustion of
(c)	Hydrogen can be used as a fuel for spacecraft. The equation for the combustion of hydrogen is $2H_2+O_2\rightarrow2H_2O$ Calculate the maximum mass of water that can be formed from the combustion of 20 g hydrogen.
(c)	Hydrogen can be used as a fuel for spacecraft. The equation for the combustion of hydrogen is $2H_2+O_2\rightarrow2H_2O$ Calculate the maximum mass of water that can be formed from the combustion of 20 g hydrogen.
(c)	Hydrogen can be used as a fuel for spacecraft. The equation for the combustion of hydrogen is $2H_2 + O_2 \rightarrow 2H_2O$ Calculate the maximum mass of water that can be formed from the combustion of 20 g hydrogen. (Relative atomic masses: H = 1.00, O = 16.0)
(c)	Hydrogen can be used as a fuel for spacecraft. The equation for the combustion of hydrogen is $2H_2 + O_2 \rightarrow 2H_2O$ Calculate the maximum mass of water that can be formed from the combustion of 20 g hydrogen. (Relative atomic masses: H = 1.00, O = 16.0)

			laber process, nitrogen reacts with hydrogen to make ammonia. nation for the reaction is shown.
			$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$
1	(a)	cha Wh	rogen and hydrogen are mixed and left under suitable conditions, until no further ange in the amount of each substance occurs. at substances will be present in the final mixture? blain your answer.
			(2)
	(b)	(i)	The Haber process is carried out at 400 °C and 200 atm. How would the equilibrium amount of ammonia change if the pressure were increased?
			(1)
		(ii)	Explain your answer.
			(1)

temperatures	hows the percentage yield of ammonia at equilibrium at d under a pressure of 200 atm.	
	70 –	
	60 –	
percentage yield of	50 -	
ammonia	40 –	
	30 –	
	20 –	
	10 –	
	0	
	300 400 500 600	
	temperature in °C	
Explain why used.	the temperature of 400°C, and not a higher or lower temperature	ıture, is

(Total 7 marks)

TOTAL FOR PAPER: 30 MARKS

(3)

Q5

END