



**ST MARY'S SCIENCE  
DEPARTMENT:  
CHEMISTRY**

**F**

**GCSE CHEMISTRY HOMEWORK BOOK  
TOPIC 2: CHEMICAL REACTIONS  
STUDENT BOOK**

**YOU MUST ANSWER ALL THREE SECTIONS IN EACH  
PART OF THE HOMEWORK TASKS**

<b>NAME</b>	
<b>CLASS</b>	
<b>TEACHER</b>	
<b>FORM</b>	

<b>TASK</b>	<b>MARK</b>	<b>GRADE</b>
<b>1</b>		
<b>2</b>		
<b>OVERALL</b>		

**GCSE  
CHEMISTRY  
YEAR 11  
TOPIC 1**



## HOMEWORK SCHEDULE

Please use the following table to ensure each homework task is completed and submitted on time.

Carrying out these homework tasks can only increase your ability to gain a high grade in the GCSE examinations.

Failure to hand in work on time will lead to sanctions to complete this work.

<b>Task</b>	<b>Submission Date</b>	<b>Completed?</b>	<b>On Time?</b>
<b>Task 1</b> Reversible Reactions 1			
<b>Task 2</b> Reversible Reactions 2			



## **SCIENCE DEPARTMENT MARKING CODE**

**ID** = Insufficient detail in answer

**W** = Wrong understanding of science

**IR** = Irrelevant information given.

**V** = This is too vague to get a mark.

**AQ** = Answer the question asked

**R** = Read the question/information

**M** = Maths mistake

**BOD** = Benefit of the doubt given.

**E** = Explain the answer further please.

**U** = Wrong units used.

**SF** = Wrong significant figures used.

**SP** = Wrong spelling of a technical term

**SR** = Same reason given more than once.

**A circle means this lost you marks**

**An underline means this gained you marks**

### **PLEASE READ**

This homework booklet has made with custom selected examination questions and activities to assess your understanding in the concepts covered in class. This will increase your familiarity with the style of examination questions.

Carrying out these questions can only increase your ability to gain a high grade in the GCSE examination.

Thank you for your hard work in completing this book, and good luck.

Mr. Turnbull



## TASK 1: REVERSIBLE REACTIONS 1

### SPEC CHECK

Content	Achieved?
<p>In some chemical reactions, the products of the reaction can react to produce the original reactants. Such reactions are called reversible reactions and are represented:</p> $A + B \rightleftharpoons C + D$ <p>The direction of reversible reactions can be changed by changing the conditions.</p> <p>ammonium chloride <math>\xrightleftharpoons[\text{cool}]{\text{heat}}</math> ammonia + hydrogen chloride</p>	
<p>If a reversible reaction is exothermic in one direction, it is endothermic in the opposite direction. The same amount of energy is transferred in each case.</p> <p>hydrated copper sulfate (blue) <math>\xrightleftharpoons[\text{exothermic}]{\text{endothermic}}</math> anhydrous copper sulfate (white) + water</p>	
<p>When a reversible reaction occurs in apparatus which prevents the escape of reactants and products, equilibrium is reached when the forward and reverse reactions occur at exactly the same rate.</p>	

### Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task? Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

**What Topics Do I Know Well?**

**What Topics Do I Need to Revise?**



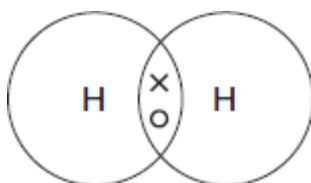
## SECTION A

**This is a revision question on a previous topic.**

You should aim to spend **10 minutes** answering this section.

**1.** Hydrogen gas is produced by the reaction of methane and steam.

The diagram represents a molecule of hydrogen.



**1.1** What type of bond joins the atoms of hydrogen?

Tick **one** box.

[1 mark]

Covalent

Metallic

Ionic

**1.2** A catalyst is used in the reaction.

Draw a ring around the correct answer to complete the sentence.

[1 mark]

A catalyst

increases the rate of reaction.  
increases the temperature.  
increases the yield of a reaction.

The equation for the reaction of methane and steam is:



**1.3** What is meant by the symbol  $\rightleftharpoons$  ?

[1 mark]

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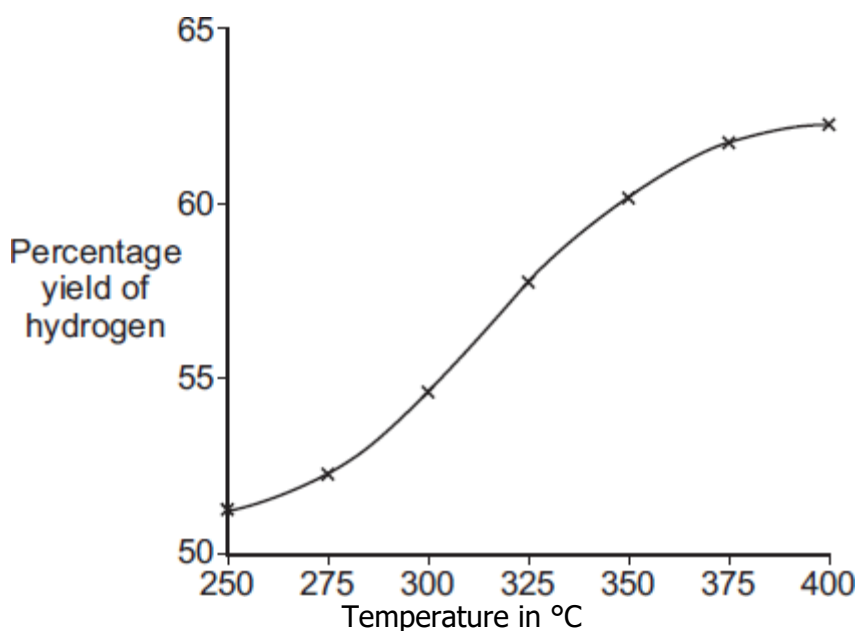
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**1.4** Lowering the pressure reduces the rate of reaction.

Explain why, in terms of particles.

**[2 marks]**

The graph shows the yield of hydrogen at different temperatures.



The forward reaction is endothermic.

**1.5** How does the graph show that the forward reaction is endothermic?**[1 mark]****1.6** Why is a higher yield produced if the reaction is repeated at a lower pressure?**[1 mark]**



**SECTION B**

**This is a question to revise understanding carried out in lesson.**  
You should aim to spend **10 minutes** answering this section.

**1.** Hydrated copper (II) sulfate is a blue solid. When it is heated, water is given off as steam and the crystals turn white. The reaction is reversible.

Describe an experiment to investigate this chemical change. You should outline the method you would use, name any apparatus required, and describe two pieces of evidence that the reaction is reversible.

**[6 marks]**

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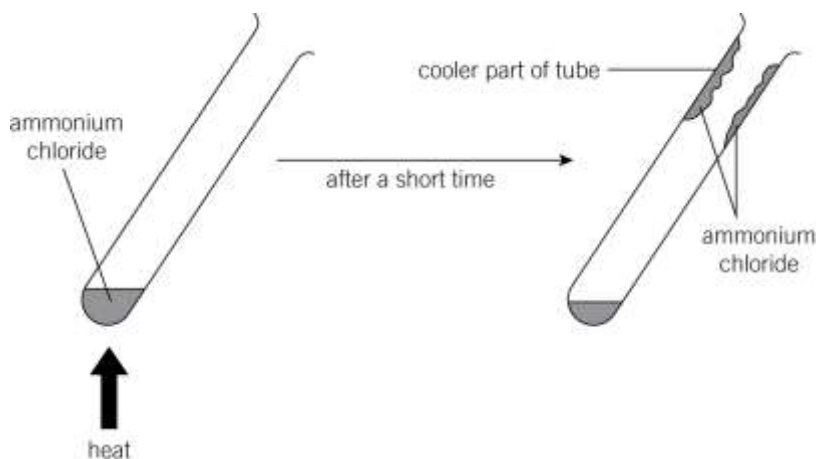
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**SECTION C**

**This is a revision question to consolidate your understanding.**

You should aim to spend **10 minutes** answering this section.

**1.** Ammonium chloride is a white solid. When it is heated, it breaks down into ammonia and hydrogen chloride gases.



**Figure 1**

The forwards reaction is endothermic:



Explain why solid ammonium chloride appears on the cooler part of the test tube.

**[3 marks]**

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## FEEDBACK SHEET

<b>Overall Mark:</b>	<b>/16</b>	<b>GRADE ACHIEVED:</b>	
<b>Section A: Mark</b>	/7	<b>5</b> <input type="checkbox"/>	<b>1</b> <input type="checkbox"/>
<b>Section B: Mark</b>	/6	<b>4</b> <input type="checkbox"/>	<b>U</b> <input type="checkbox"/>
<b>Section C: Mark</b>	/3	<b>3</b> <input type="checkbox"/>	
		<b>2</b> <input type="checkbox"/>	

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
<b>Strengths:</b>	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills <b>Others</b> (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
<b>Areas to Improve:</b>	<input type="checkbox"/> Basic Knowledge of Concepts <input type="checkbox"/> Quality of Written Communication <input type="checkbox"/> Working Scientifically <input type="checkbox"/> Answering Examination Questions <input type="checkbox"/> Analytical Skills <b>Others</b> (Topic Specific)		<input type="checkbox"/> Applications of Concepts <input type="checkbox"/> Mathematical Skills <input type="checkbox"/> Experimental Technique <input type="checkbox"/> Previous Topics <input type="checkbox"/> Problem Solving	
<b>Progress:</b>	Unsatisfactory	Satisfactory	Good	Outstanding
<b>Working:</b>	Below	In line with	Above	<b>(your target)</b>
<b>Effort:</b>	Poor	Inconsistent	Good	Excellent

### To improve further you need to:

<input type="checkbox"/> Carry out <b>independent</b> revision. <input type="checkbox"/> Complete outstanding work. <input type="checkbox"/> Make corrections as indicated by the teacher. <input type="checkbox"/> Attend intervention for this topic <input type="checkbox"/> Include more information in responses. <input type="checkbox"/> Include more key words in responses. <input type="checkbox"/> Attend departmental revision sessions. <input type="checkbox"/> Read the questions carefully. <input type="checkbox"/> Explain your answers in more detail. <input type="checkbox"/> Carry out revision on Seneca Learning.	<input type="checkbox"/> Revise the equations. <input type="checkbox"/> Check the units on answers. <input type="checkbox"/> Check the correct amount of sig figs on answers. <input type="checkbox"/> Check to convert values correctly. <input type="checkbox"/> Show your full working out. <input type="checkbox"/> Check your calculations. <input type="checkbox"/> Revise the science investigative skills. <input type="checkbox"/> Revise the key concepts of the topics. <input type="checkbox"/> Thoroughly check your work for mistakes. Other:
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### Student response



## TASK 2: REVERSIBLE REACTIONS 2

### SPEC CHECK

Content	Achieved?
<p>In some chemical reactions, the products of the reaction can react to produce the original reactants. Such reactions are called reversible reactions and are represented:</p> $A + B \rightleftharpoons C + D$ <p>The direction of reversible reactions can be changed by changing the conditions.</p> <p>ammonium chloride <math>\xrightleftharpoons[\text{cool}]{\text{heat}}</math> ammonia + hydrogen chloride</p>	
<p>If a reversible reaction is exothermic in one direction, it is endothermic in the opposite direction. The same amount of energy is transferred in each case.</p> <p>hydrated copper sulfate (blue) <math>\xrightleftharpoons[\text{exothermic}]{\text{endothermic}}</math> anhydrous copper sulfate (white) + water</p>	
<p>When a reversible reaction occurs in apparatus which prevents the escape of reactants and products, equilibrium is reached when the forward and reverse reactions occur at exactly the same rate.</p>	

### Target Setting

In this assessed piece of work, what target should I look to achieve in completing this task? Please refer to your marking feedback for your target.

From your previous work, fill in the following boxes with your personal progress in Physics.

**What Topics Do I Know Well?**

**What Topics Do I Need to Revise?**

**SECTION A**

**This is a revision question on a previous topic.**

You should aim to spend **10 minutes** answering this section.

- 1.** A student planned to make copper sulfate crystals from excess copper oxide and dilute sulfuric acid. The equation for the reaction is:



- 1.1** Why is it necessary to add excess copper oxide?

**[1 mark]**

.....

.....

- 1.2** This is the method used.

- 1.** Add 25 cm<sup>3</sup> of dilute sulfuric acid to a conical flask.
- 2.** Gently warm the dilute sulfuric acid.
- 3.** Add excess copper oxide to the dilute sulfuric acid.
- 4.** Stir the mixture.
- 5.** Heat to evaporate all the water from the mixture.

Suggest **two** improvements to the method.

Explain why each improvement is needed.

**[4 marks]**

**Improvement 1**

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**Improvement 2**

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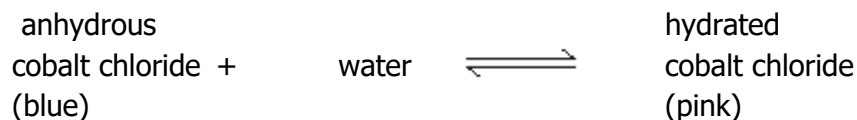


## SECTION B

**This is a question to revise understanding carried out in lesson.**

You should aim to spend **10 minutes** answering this section.

**1.** The word equation shows the reaction between anhydrous cobalt chloride and water.



**1.1** Name the type of reaction shown by the sign  $\rightleftharpoons$

[1 mark]

**1.2** When the student added water to anhydrous cobalt chloride what happened?

[1 mark]

**1.3** A student measured the temperature rise when anhydrous cobalt chloride was added to water.

The student's results are shown in the table below.

	<b>Trial 1</b>	<b>Trial 2</b>	<b>Trial 3</b>
<b>Temperature rise in °C</b>	8.5	8.2	8.2

Calculate the mean temperature rise.

[1 mark]

**1.4** When water was added to anhydrous cobalt chloride an exothermic reaction took place.

Name the type of reaction when hydrated cobalt chloride reacts to form anhydrous cobalt chloride and water.

[1 mark]

**SECTION C**

**This is a revision question to consolidate your understanding.**

You should aim to spend **10 minutes** answering this section.

**1.** The Contact process is an industrial method for making sulfuric acid from sulfur, oxygen, and water.

One important reaction in the Contact process is:



Choose words from the box to complete the questions that follow.

<b>reversible</b>	<b>temperature</b>	<b>reactants</b>	<b>yield</b>	<b>complete</b>
<b>backwards</b>	<b>closed</b>	<b>equilibrium</b>	<b>pressure</b>	<b>products</b>

The rate of the reaction can be increased by raising the ..... or the .....

**[2 marks]**

The symbol  $\rightleftharpoons$  means the reaction is .....

**[1 mark]**

When the forward and backward reaction rates are equal, the reaction is at .....

There is no change in the amounts of ..... or .....

**[3 marks]**



## FEEDBACK SHEET

<b>Overall Mark:</b>	<b>/15</b>	<b>GRADE ACHIEVED:</b>	
<b>Section A: Mark</b>	/5	<b>5</b> <input type="checkbox"/>	<b>1</b> <input type="checkbox"/>
<b>Section B: Mark</b>	/4	<b>4</b> <input type="checkbox"/>	<b>U</b> <input type="checkbox"/>
<b>Section C: Mark</b>	/6	<b>3</b> <input type="checkbox"/>	
		<b>2</b> <input type="checkbox"/>	

Knowledge and understanding shown	Unsatisfactory	Satisfactory	Good	Outstanding
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### Student response



# The Periodic Table of Elements

1	2	3	4	5	6	7	0																																																																	
7 <b>Li</b> lithium 3	9 <b>Be</b> beryllium 4	11 <b>Na</b> sodium 11	12 <b>C</b> carbon 6	13 <b>Al</b> aluminium 13	14 <b>N</b> nitrogen 7	15 <b>P</b> phosphorus 15	16 <b>O</b> oxygen 8	17 <b>F</b> fluorine 9	18 <b>Ne</b> neon 10																																																															
19 <b>K</b> potassium 19	20 <b>Ca</b> calcium 20	23 <b>Sc</b> scandium 21	24 <b>Ti</b> titanium 22	27 <b>V</b> vanadium 23	28 <b>Cr</b> chromium 24	29 <b>Mn</b> manganese 25	30 <b>Fe</b> iron 26	31 <b>Co</b> cobalt 27	32 <b>Ni</b> nickel 28	35 <b>Zn</b> zinc 30	36 <b>Ga</b> gallium 31	37 <b>Ge</b> germanium 32	39 <b>K</b> potassium 39	40 <b>Ca</b> calcium 40	45 <b>Sc</b> scandium 41	46 <b>Ti</b> titanium 42	47 <b>V</b> vanadium 43	48 <b>Cr</b> chromium 44	50 <b>Fe</b> iron 46	51 <b>Co</b> cobalt 47	52 <b>Ni</b> nickel 48	54 <b>Zn</b> zinc 50	55 <b>Ga</b> gallium 51	56 <b>Ge</b> germanium 52	59 <b>As</b> arsenic 53	60 <b>Se</b> selenium 54	63 <b>Br</b> bromine 55	65 <b>Kr</b> krypton 56	71 <b>Rb</b> rubidium 71	72 <b>Sr</b> strontium 72	73 <b>Y</b> yttrium 73	74 <b>Zr</b> zirconium 74	75 <b>Nb</b> niobium 75	76 <b>Mo</b> molybdenum 76	77 <b>Tc</b> technetium 77	78 <b>Ru</b> ruthenium 78	80 <b>Rh</b> rhodium 80	81 <b>Pd</b> palladium 81	82 <b>Ag</b> silver 82	83 <b>Cd</b> cadmium 83	85 <b>In</b> indium 85	86 <b>Sn</b> tin 86	87 <b>Sb</b> antimony 87	88 <b>Te</b> tellurium 88	91 <b>I</b> iodine 91	92 <b>Xe</b> xenon 92	93 <b>Fr</b> francium 87	94 <b>Ra</b> radium 88	95 <b>Ac*</b> actinium 89	96 <b>La*</b> lanthanum 57	97 <b>Hf</b> hafnium 72	98 <b>Ta</b> tantalum 73	99 <b>W</b> tungsten 74	100 <b>Re</b> rhenium 75	101 <b>Os</b> osmium 76	102 <b>Ir</b> iridium 77	103 <b>Pt</b> platinum 78	104 <b>Au</b> gold 79	105 <b>Hg</b> mercury 80	106 <b>Tl</b> thallium 81	107 <b>Pb</b> lead 82	108 <b>Bi</b> bismuth 83	109 <b>Po</b> polonium 84	110 <b>At</b> astatine 85	111 <b>Rn</b> radon 86	112 <b>Cn</b> copernicium 112	113 <b>Nh</b> nihonium 113	114 <b>Fl</b> flerovium 114	115 <b>Mc</b> moscovium 115	116 <b>Lv</b> livermorium 116	117 <b>Ts</b> tennessine 117	118 <b>Og</b> oganesson 118

1 H hydrogen 1

Key  
relative atomic mass  
atomic symbol  
name  
atomic (proton) number

\* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted. Relative atomic masses for Cu and Cl have not been rounded to the nearest whole number.



### Acknowledgements

This document has been produced by Mr J Turnbull.

All relevant information has been credited in the document.

This document has been produced for educational purposes only.

This document has been produced for the AQA GCSE Science Specification.

