

## Year 13 - OCR A-level (H432) Chemistry

Timing	Unit Title	Key Question	Knowledge	Assessing understanding
Autumn Term 1	<b>Module 6 Chapter 26</b>  <b>Carbonyls and carboxylic acids</b>	<b>What are the key reactions in carbonyl chemistry?</b>	<ul style="list-style-type: none"> <li>● Properties and reactions of aldehydes and ketones</li> <li>● Testing for aldehydes and ketones</li> <li>● Mechanism of nucleophilic addition</li> <li>● Properties and reactions of carboxylic acids</li> <li>● Synthesis of acyl chlorides and esters</li> <li>● Reactions of esters, acyl chlorides and acid anhydrides</li> </ul>	<p><b>How understanding is assessed</b> Students will be assessed on their ability to:</p> <ul style="list-style-type: none"> <li>● Recall the knowledge covered</li> <li>● Explain the chemical phenomena</li> <li>● Interpret graphical and experimental data</li> <li>● Make connections between different areas of understanding.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>● Description</li> <li>● Explanation</li> <li>● Evaluation</li> <li>● Comparison</li> <li>● Planning and carrying out investigations</li> <li>● Chemical calculations</li> </ul> <p><b>Assessment point information</b></p> <ul style="list-style-type: none"> <li>● Written test</li> <li>● Teacher continuous assessment</li> <li>● Required Practical Activity 9.2 Measuring rate</li> <li>● Required Practical Activity 10.1 Rate and mechanism</li> <li>● Required Practical activity 10.3 Arrhenius plot</li> <li>● Required Practical activity 7.3 (part 1) Identifying organic compounds</li> </ul>
	<b>Module 5 Chapter 18</b>  <b>Rate of reaction</b>	<b>How can we measure how fast a reaction will go?</b>	<ul style="list-style-type: none"> <li>● Rate equations, rate constants and order of reaction</li> <li>● Experimental determination of rate equations</li> <li>● Graphical analysis of rate data</li> <li>● Half life</li> <li>● Rate determining step and reaction mechanism</li> <li>● The effect of temperature on rate</li> <li>● Arrhenius plots</li> </ul>	
	<b>Module 5 Chapter 18</b>  <b>Energy and entropy</b>	<b>What determines if a reaction will go?</b>	<ul style="list-style-type: none"> <li>● Lattice enthalpy and Born Haber cycles</li> <li>● Enthalpy changes in solution and predicting solubility</li> <li>● Entropy</li> <li>● Gibbs Free Energy and feasibility</li> </ul>	

	<b>Module 5</b> <b>Chapter 20</b>  <b>Acids, bases and pH</b>	<b>How can we explain the properties of a range of acids and bases?</b>	<ul style="list-style-type: none"> <li>● Acids bases and pH</li> <li>● <math>K_a</math> and <math>K_w</math></li> <li>● Titrations and indicators</li> <li>● Buffers and buffer calculations,</li> </ul>	
Autumn Term 2	<b>Module 6</b> <b>Chapter 29</b>  <b>Analytical techniques</b>	<b>How can we determine the structure of organic molecules?</b>	<ul style="list-style-type: none"> <li>● Chromatography</li> <li>● <math>^{13}\text{C}</math> NMR nuclear magnetic resonance spectroscopy</li> <li>● Proton NMR</li> <li>● Combined techniques</li> </ul>	<b>How understanding is assessed</b> Students will be assessed on their ability to: <ul style="list-style-type: none"> <li>● Recall the knowledge covered</li> <li>● Explain the chemical phenomena</li> <li>● Interpret graphical and experimental data</li> <li>● Make connections between different areas of understanding.</li> </ul> <b>Skills</b> <ul style="list-style-type: none"> <li>● Description</li> <li>● Explanation</li> <li>● Evaluation</li> <li>● Comparison</li> <li>● Planning and carrying out investigations</li> <li>● Chemical calculations</li> </ul> <b>Assessment point information</b> <ul style="list-style-type: none"> <li>● Written test</li> <li>● Teacher continuous assessment</li> <li>● Required Practical activity 11.2 pH curves</li> <li>● Required Practical activity 7.3 (part 2) Chromatography</li> </ul>
	<b>Module 5</b> <b>Buffers and neutralisation</b> <b>Chapter 21</b>	<b>How do buffers work to control pH?</b>	<ul style="list-style-type: none"> <li>● Neutralisation</li> <li>● What is a buffer solution</li> <li>● Calculating pH of buffers</li> <li>● Buffer solutions in the body</li> </ul>	

Spring Term 1	<b>Mock Exams</b>		<ul style="list-style-type: none"> <li>Mock exams will cover all of the Chemistry learned during Year 12 and the Autumn Term of Year 13</li> </ul>	<p><b>How understanding is assessed</b> Students will be assessed on their ability to:</p> <ul style="list-style-type: none"> <li>Recall the knowledge covered</li> <li>Explain the chemical phenomena</li> <li>Interpret graphical and experimental data</li> <li>Make connections between different areas of understanding.</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>Description</li> <li>Explanation</li> <li>Evaluation</li> <li>Comparison</li> <li>Planning and carrying out investigations</li> <li>Chemical calculations</li> </ul> <p><b>Assessment point information</b></p> <p>Based on two written mock examination papers:</p> <ul style="list-style-type: none"> <li>Physical and Inorganic chemistry</li> <li>Organic Chemistry and Analytical techniques</li> </ul>
	<b>Module 5 Chapter 23 Redox</b>	<b>How can we use an understanding of redox in titrimetric analysis and in predicting reactions?</b>	<ul style="list-style-type: none"> <li>Oxidation number</li> <li>Reaction stoichiometry and redox titrations</li> <li>Measuring <math>E^{\ominus}</math></li> <li>Predicting feasibility and extent of reactions</li> </ul>	
	<b>Module 6 Chapter 27 Nitrogen chemistry</b>	<b>How is DNA bonded? What other molecules are similar?</b>	<ul style="list-style-type: none"> <li>Reactions of aliphatic and aromatic amines</li> <li>Amides</li> <li>Amino acids, polypeptides and proteins</li> <li>Chirality</li> <li>Polyesters and polyamides e.g. nylon.</li> </ul>	

Spring Term 2	<b>Module 6 Chapter 28</b>  <b>Organic synthesis</b>	<b>How can we make useful organic products in the laboratory?</b>	<ul style="list-style-type: none"> <li>● Review of practical skills and activities</li> <li>● Synthetic routes</li> <li>● Practical processes for synthesis</li> </ul>	<b>How understanding is assessed</b> Students will be assessed on their ability to: <ul style="list-style-type: none"> <li>● Recall the knowledge covered</li> <li>● Explain the chemical phenomena</li> <li>● Interpret graphical and experimental data</li> <li>● Make connections between different areas of understanding.</li> </ul> <b>Skills</b> <ul style="list-style-type: none"> <li>● Description</li> <li>● Explanation</li> <li>● Evaluation</li> <li>● Comparison</li> <li>● Planning and carrying out investigations</li> <li>● Chemical calculations</li> </ul>
	<b>Module 5 Chapter 24 Transition metals</b>	<b>How do transition metals react?</b>	<ul style="list-style-type: none"> <li>● What is a transition metal and what are their characteristic properties</li> <li>● Complex ions and stereoisomerism</li> <li>● Ligand substitution and precipitation</li> <li>● Redox and qualitative analysis</li> </ul>	<b>Assessment point information</b>  Based on: <ul style="list-style-type: none"> <li>● Completed folders for the Practical Endorsement</li> <li>● Required Practical activity 12 Analysing iron tablets</li> <li>● Required Practical activity 8.1 Electrochemical cells</li> </ul>
	<b>Mock Exams and revision</b>	<b>What is the best preparation for your A-level exams</b>	<ul style="list-style-type: none"> <li>● Revision and past paper practice</li> </ul>	

Summer Term				<p><b>How understanding is assessed</b></p> <p>Students will be assessed on their ability to:</p> <ul style="list-style-type: none"><li>● Recall the knowledge covered</li><li>● Explain the chemical phenomena</li><li>● Interpret graphical and experimental data</li><li>● Make connections between different areas of understanding.</li></ul> <p><b>Skills</b></p> <ul style="list-style-type: none"><li>● Description</li><li>● Explanation</li><li>● Evaluation</li><li>● Comparison</li><li>● Planning and carrying out investigations</li><li>● Chemical calculations</li></ul> <p><b>Assessment point information</b></p> <p>Based on:</p> <ul style="list-style-type: none"><li>● Further mock examination paper</li></ul>
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