

Year 12 - OCR A-level (H432) Chemistry

Timing	Unit Title	Key Question	Knowledge	Assessing understanding
Autumn Term 1	Module 2 Chapter 2 Chapter 5 Chapter 7 Structure of atoms Bonding	What are the nuclear and electronic structure of atoms? How do atoms bond together?	- Atoms and isotopes - RAM and using a mass spectrometer - Arrangement of electrons in atoms - Ionisation energy - Electronic configuration and s,p,d, f orbitals - Theories of ionic, covalent and metallic bonding - Periodicity	How understanding is assessed Students will be assessed on their ability to: - Recall the knowledge covered - Explain the chemical phenomena - Interpret graphical and experimental data - Make connections between different areas of understanding. Skills - Description - Explanation - Evaluation - Comparison - Planning and carrying out investigations - Chemical calculations Assessment point information Based on two written tests on: - Atomic Structure and Calculations - Structure and Bonding Practical endorsement 1.2 <u>Determination of the relative atomic mass of magnesium</u> 2.1 <u>Determination of concentration of hydrochloric acid</u>
	Module 2 Chapter 3 Amounts of substance	How do we calculate amounts of substance in chemistry?	- Formulae and equations, - Using moles - Measuring concentration - Reacting masses % yield and atom economy. - Gas calculations and Ideal Gas Equation - Titration and titration calculations	
	Module 2 Chapter 4 Acids and Redox	How can we make and purify salts?	- Acid-base reactions and salt production - Anhydrous and hydrated salts	

Autumn Term 2	Module 2 Chapter 6 Shapes of molecules	How can we predict the shapes of molecules?	• VSEPR theory and shapes of molecules. • Types of intermolecular forces	• 2.2 <u>Determination of the molar mass of an acid</u>
	Module 2 Chapter 4 Redox	How is the concept of oxidation number useful in explaining redox reactions?	• Oxidation number • Balancing redox equations	
	Module 3 Chapter 8 Reactivity Trends	How are reactions related to position of an element in the periodic table?	• Reactions of Group 2 metals and compounds. • Reactions of Group 7 – the halogens and their compounds • Qualitative analysis	

	Module 4 Chapter 11 Chapter 12	What are the structures and properties of hydro-carbons?	• Origin of hydrocarbons and nomenclature • Reactions of alkanes • Types of bond breaking • Free radical substitution	
Spring Term 1	Module 3 Chapter 9 Energy	How much energy change is associated with chemical reactions?	• Measuring energy changes • Defining important enthalpy changes • Using Hess's Law • Using bond enthalpies	How understanding is assessed Students will be assessed on their ability to: • Recall the knowledge covered • Explain the chemical phenomena • Interpret graphical and experimental data • Make connections between different areas of understanding. Skills • Description • Explanation • Evaluation • Comparison • Planning and carrying out investigations • Chemical calculations Assessment point information Based on: • Two written tests on - o Periodic Table and Energy - o Organic Chemistry Practical endorsement • 4.2 <u>Identifying unknowns</u>
	Module 4 Chapter 13 Organic Chemistry	What are the structures and properties of hydro-carbons?	• Reactions of alkenes • The carbon-carbon double bond and delocalisation • Cis-trans/E-Z isomerism • Electrophilic addition and Markovnikov's rule • Describing mechanisms using curly arrow notation • Polymerisation and issues surrounding use, recycling and disposal of plastics	
	Module 3 Chapter 10	What influences the rate of a chemical reaction?	• Qualitative ideas about factors that affect chemical reactions • Methods for measuring rates of reaction	

	Rate Equilibrium	How far do reactions go?	• Activation energy • Catalysis • Qualitative ideas about dynamic equilibrium • Changing the position of equilibrium	• 3.1 <u>Determination of the enthalpy change of neutralisation</u> • 3.2 <u>Determination of a enthalpy change of reaction by Hess' Law</u> • 3.3 <u>Determination of enthalpy changes of combustion</u> • 5.2 <u>Preparation of cyclohexene</u>
Spring Term 2	Module 4 Chapter 14 Chapter 15 Chapter 16 Alcohols and halogeno-alkanes	What are the structures and properties of alcohols and halogenoalkanes?	• Properties and reactions of alcohols • Reactions of halogenoalkanes • Uses of halogenoalkanes and associated issues • Identifying halogenoalkanes • Preparing halogenoalkanes from alcohols and vice versa • Organic synthetic techniques	How understanding is assessed Students will be assessed on their ability to: • Recall the knowledge covered • Explain the chemical phenomena • Interpret graphical and experimental data • Make connections between different areas of understanding. Skills • Description • Explanation • Evaluation • Comparison • Planning and carrying out investigations • Chemical calculations
	Module 4 Chapter 17 Analytical techniques	What information can we obtain from analysis of chemical compounds?	• Mass spectrometry • Infra-red spectroscopy	
Summer Term 1	Study leave and exams	What is the best preparation for your AS/Internal Chemistry exams?	• Revision and past paper practise	How understanding is assessed Students will be assessed on their ability to: • Recall the knowledge covered

				• Explain the chemical phenomena • Interpret graphical and experimental data • Make connections between different areas of understanding. Skills • Description • Explanation • Evaluation • Comparison • Planning and carrying out investigations • Chemical calculations Assessment point information Based on: • Internal AS level examinations
Summer Term 2	Module 5 Chapter 19 Equilibria	What happens when reactions do not go to completion?	• Equilibrium constants • Calculating K_c and K_p • Determination of K_c • Effect of concentration, temperature, pressure and catalysts on equilibrium position	Practical endorsement • 6 <u>Preparation of aspirin</u>
	Module 6 Chapter 25 Arene chemistry	What is so special about C_6H_6?	• Structure and bonding in benzene • Electrophilic substitution mechanism • Reactions of benzene • Reactions of phenol • Directing groups	
	Practical skills		• Making aspirin	

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