



Topic name	Term	Skills developed	Link to Subject Content	Prior learning	Next link in curriculum
Optical Isomerism	Autumn	MS 4.1, 4.2 and 4.3	Optical isomerism	A Level	3.3.8 Aldehydes and Ketones
		Students could be asked to recognise the presence of	Asymmetric carbon atom is chiral	3.3.1 Introduction to	
		a chiral centre in a given structure in 2D or 3D forms.		Organic Chemistry	Mechanistic attack at the carbonyl group
		They could also be asked to draw the 3D	3D drawings of +/- enantiomers	3.3.4 Alkenes	(Hydroxynitriles)
		representation of chiral centres in various species.	ob drawings of 17 chandomers	3.3.13 Amino Acids	
		Students understand the origin of optical isomerism.	Optical isomers differ in their effect on plane polarised light.	0.0.13 Allillo Acids	
		AT a and k PS 1.2 Passing polarised light through a solution of sucrose.	A mixture of equal amounts of enantiomers - racemic mixture (racemate).		
Aldehydes and Ketones	Autumn	AT b, d and k PS 2.2 Students could carry out test-tube reactions of Tollens' reagent and Fehling's solution to distinguish aldehydes and ketones. Students should be able to: write overall equations for reduction reactions using [H] as the reductant outline the nucleophilic addition mechanism for reduction with NaBH4,nucleophile shown as H ⁻ write overall equations for the formation of	Tollens' gives a silver mirror with aldehydes and Fehling's changes from blue to red/orange Reduction of aldehydes The nucleophilic addition reactions of carbonyl compounds with KCN, followed by dilute acid, to produce hydroxynitriles. Aldehydes and unsymmetrical ketones form mixtures of	Building on knowledge from AS Alcohols Unit	3.3.14 Organic Synthesis





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		hydroxynitriles	enantiomers when they react with		
		outline the nucleophilic addition mechanism	KCN followed by dilute acid.		
		for the reaction with KCN followed by dilute acid	The hazards of using KCN.		
		explain why nucleophilic addition reactions			
		of KCN, followed by dilute acid, can produce			
		a mixture of enantiomers.			
Carboxylic Acids and Derivatives	Spring	AT b, d, g, h and k	Esterification Reactions	A Level	3.3.14 Organic Synthesis
		Students could identify an ester by measuring its	Ester Hydrolysis	3.3.1 Introduction to Organic Chemistry	
		boiling point, followed by hydrolysis to form the			
		carboxylic acid, which is purified by recrystallisation,	Biodiesel is produced by reacting	3.3.5 Alcohols	
		and determine its melting point.	vegetable oils with methanol in the		
		AT b and k	presence of a catalyst.		
		Students make biodiesel.	The structures of:		
		AT d and k	acid anhydrides		
		PS 2.2	acyl chlorides		
		Students record observations from reaction of	• amides.		
		ethanoyl chloride and ethanoic anhydride with water,	The nucleophilic addition-		
		ethanol, ammonia and phenylamine.	elimination reactions of water,		
		AT b, d, g and h	alcohols, ammonia and primary		
		PS 2.1, 2.3 and 4.1	amines with acyl chlorides and acid		
		Students carry out the preparation of aspirin,	anhydrides.		
		purification by recrystallisation and determination of			
		its melting point.	Required practical 10 Preparation of:		





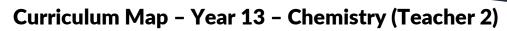
		Students carry out the purification of impure benzoic acid and determination of its melting point.	-a pure organic solid and test of its purity -a pure organic liquid.		
Aromatic Chemistry	Spring	AT b, d, g and h PS 2.1, 2.3 and 4.1 Students could carry out the preparation of methyl 3- nitrobenzoate by nitration of methyl benzoate, purification by recrystallisation and determination of melting point Students should be able to outline the electrophilic substitution mechanisms of: • nitration, including the generation of the nitronium ion • acylation using AlCl3 as a catalyst.	Bonding in a benzene ring Delocalisation and stability Electrophilic substitution Friedel-Crafts acylation reactions	A Level 3.3.1 Introduction to Organic Chemistry 3.3.4 Alkenes	3.3.14 Organic Synthesis
Amines	Spring		Preparation of amines Aromatic amines and uses Amines as weak bases and nucleophiles Mechanism of formation of primary, secondary, tertiary amines and	A Level 3.3.1 Introduction to Organic Chemistry 3.3.3 Halogenoalkanes	3.3.14 Organic Synthesis





			quaternary ammonium salts. The nucleophilic addition- elimination reactions		
Polymers Condensation Polymers	Spring	AT k PS 1.2 Making nylon 6,6	 Condensation polymers reactions: dicarboxylic acids and diols dicarboxylic acids and diamines amino acids. 	A Level 3.3.1 Introduction to Organic Chemistry 3.3.12 Polymers	N/A
			Polyalkenes are chemically inert and non-biodegradable Polyesters and polyamides can be broken down by hydrolysis and are biodegradable Advantages and disadvantages of different methods of disposal of polymers, including recycling		
Organic Synthesis	Summer		The synthesis of an organic compound can involve several steps Predict the types of reaction steps, reagents and / or mechanisms required to synthesise a given	Brings together knowledge of all organic reactions and uses of products	N/A







			organic molecule.		
Nuclear Magnetic Resonance	Summer	Using data in the Chemistry Data Booklet to suggest	Interpretation of nuclear magnetic	A Level	N/A
Spectroscopy		possible structures for molecules.	resonance (NMR) of ¹³ C or ¹ H atoms		
			in a molecule.	3.3.6 Organic	
				Analysis	
Chromatography	Spring or Summer	AT a, i and k	Types of chromatography include:	GCSE	N/A
	Julilliel	PS 1.2, 3.2 and 4.1			
		Students could use thin-layer chromatography to	thin-layer chromatography	4.8 Chemical Analysis	
		identify analgesics.	(TLC)		
		, ,	 column chromatography 		
		Students could use thin-layer chromatography to	(CC)		
		identify transition metal ions in a solution.	• gas chromatography (GC)		
		Calculate R _f values from a chromatogram			
		Compare retention times and R_f values with standards to identify different substances.	Retention times and R_f values are used to identify different substances.		
		Required practical 12			
		Separation of species by thin-layer chromatography.			
		Good to combine with Required Practical 10			