CHEMISTRY KS5 CURRICULUM MAP

Specifications Taught

A-level Chemistry – AQA Specification (8462)

YEAR	TERM	Topic	
		Teacher 1	**Teacher 2**
12	AUTUMN	**3.1.1 Atomic structure** 3.1.1.1 Fundamental particles 3.1.1.2 Mass number and isotopes 3.1.1.3 Electron configuration **3.1.3 Bonding** 3.1.3.1 Ionic bonding 3.1.3.2 Nature of covalent and dative covalent bonds 3.1.3.3 Metallic bonding 3.1.3.4 Bonding and physical properties 3.1.3.5 Shapes of simple molecules and ions 3.1.3.6 Bond polarity 3.1.3.7 Forces between molecules **3.1.4 Energetics** 3.1.4.1 Enthalpy change 3.1.4.2 Calorimetry 3.1.4.3 Applications of Hess's law 3.1.4.4 Bond enthalpies **Required practical 2** Measurement of an enthalpy change. **3.2.1 Periodicity** 3.2.1.1 Classification 3.2.1.2 Physical properties of Period 3 elements	**3.1.2 Amount of substance** 3.1.2.1 Relative atomic mass and relative molecular mass 3.1.2.2 The mole and the Avogadro constant 3.1.2.4 Empirical and molecular formula **3.3.1 Introduction to Organic Chemistry** 3.3.1.1 Nomenclature 3.3.1.2 Reaction mechanisms 3.3.1.3 Isomerism **3.3.2 Alkanes** 3.3.2.1 Fractional distillation of crude oil 3.3.2.2 Modification of alkanes by cracking 3.3.2.3 Combustion of alkanes 3.3.2.4 Chlorination of alkanes **3.1.2 Amount of substance** 3.1.2.3 The ideal gas equation 3.1.2.5 Balanced equations and associated calculations **Required practical 1** Make up a volumetric solution and carry out a simple acid–base titration.
	SPRING	**3.1.5 Kinetics** 3.1.5.1 Collision theory 3.1.5.2 Maxwell–Boltzmann distribution 3.1.5.3 Effect of temperature on reaction rate 3.1.5.4 Effect of concentration and pressure 3.1.5.5 Catalysts **Required practical 3** Investigation of how the rate of a reaction changes with temperature.	**3.1.7 Oxidation, Reduction and Redox Equations** **3.1.6 Chemical equilibria, Le Chatelier's principle and K_c** **3.1.10 Equilibrium constant Kp for homogeneous systems** **3.2.2 Group 2, the alkaline earth metals**

		3.3.6 Organic analysis 3.3.6.1 Identification of functional groups by test-tube reactions 3.3.6.2 Mass spectrometry 3.3.6.3 Infrared spectroscopy **Required practical 6** Tests for alcohol, aldehyde, alkene and carboxylic acid.	**3.2.3 Group 7(17), the halogens** 3.2.3.1 Trends in properties 3.2.3.2 Uses of chlorine and chlorate(I) **Required practical 4** Carry out simple test-tube reactions to identify cations – Group 2, NH_4^+; and anions – halides , OH^-, CO_3^{2-}, SO_4^{2-} **3.3.3 Halogenalkanes** 3.3.3.1 Nucleophilic substitution 3.3.3.2 Elimination 3.3.3.3 Ozone depletion **3.3.4 Alkenes** 3.3.4.1 Structure, bonding and reactivity 3.3.4.2 Addition reactions of alkenes 3.3.4.3 Addition polymers
	SUMMER	**3.3.7 Optical isomerism** **3.3.8 Aldehydes and ketones** **Required practical 5** Distillation of a product from a reaction.	**3.3.5 Alcohols** 3.3.5.1 Alcohol production 3.3.5.2 Oxidation of alcohols 3.3.5.3 Elimination **3.3.8 – Aldehydes & Ketones** **3.3.9 Carboxylic acids and derivatives** 3.3.9.1 Carboxylic acids and esters 3.3.9.2 Acylation **Required practical 10** Preparation of: - a pure organic solid and test of its purity - a pure organic liquid.
13	**AUTUMN**	**3.1.9 Rate equations** 3.1.9.1 Rate equations 3.1.9.2 Determination of rate equation **Required practical 7** Measuring the rate of reaction: - by an initial rate method - by a continuous monitoring method.	**3.3.10 Aromatic Chemistry** 3.3.10.1 Bonding 3.3.10.2 Electrophilic substitution **3.3.11 Amines** 3.3.11.1 Preparation 3.3.11.2 Base properties 3.3.11.3 Nucleophilic properties **3.3.12 Polymers** 3.3.12.1 Condensation polymers

		3.1.11 Electrode potentials and electrochemical cells 3.1.11.1 Electrode potentials and cells 3.1.11.2 Commercial applications of electrochemical cells **Required practical 8** Measuring the EMF of an electrochemical cell.	3.3.12.2 Biodegradability and disposal of polymers **3.3.13 Amino acids, proteins and DNA** 3.3.13.1 Amino acids 3.3.13.2 Proteins 3.3.13.3 Enzymes 3.3.13.4 DNA 3.3.13.5 Action of anticancer drugs **3.3.15 Nuclear magnetic resonance spectroscopy** **3.3.16 Chromatography** **Required practical 12** Separation of species by thin-layer chromatography.
	SPRING	**3.2.5 Transition metals** 3.2.5.1 General properties of transition metals 3.2.5.2 Substitution reactions 3.2.5.3 Shapes of complex ions 3.2.5.4 Formation of coloured ions 3.2.5.5 Variable oxidation states 3.2.5.6 Catalysts **3.2.6 Reactions of ions in aqueous solution** **Required practical 11** Carry out simple test-tube reactions to identify transition metal ions in aqueous solution.	**3.1.8 Thermodynamics** 3.1.8.1 Born–Haber cycles 3.1.8.2 Gibbs free-energy change, ΔG, and entropy change, ΔS **3.1.12 Acids and bases** 3.1.12.1 Brønsted–Lowry acid–base equilibria in aqueous solution 3.1.12.2 Definition and determination of pH 3.1.12.3 The ionic product of water, Kw 3.1.12.4 Weak acids and bases Ka for weak acids 3.1.12.5 pH curves, titrations and indicators 3.1.12.6 Buffer action **Required practical 9** Investigate how pH changes when a weak acid reacts with a strong base and when a strong acid reacts with a weak base.
	SUMMER	**3.3.14 Organic synthesis** **Sweep up & Preparation for Final Examinations** **Final Examinations**	