A Level Chemistry Learning Journey

Exam Preparation and Revision

Combined techniques
NMR spectra of –NH protons
NMR spectra of –OH protons
Proton NMR spectroscopy
Carbon-13 NMR spectroscopy
Nuclear magnetic resonance

Preparation of amines
Reactions of amino acids
Amides
Chirality
Condensation polymers
Hydrolysis of polymers
Extending carbon chain lengths
Reaction of nitriles
Substitution reactions in aromatic compounds
Practical skills for organic synthesis
Synthetic routes in organic synthesis
Chromatography
Tests for organic functional groups

Basicity of amines
Acyl Chlorides
Esters
Carboxylic acids
Characteristic tests for carbonyl compounds
Reactions of carbonyl compounds
Electrophilic substitution in aromatic compounds
Phenols
Friedel-Crafts
Halogenation
Electrophilic substitution
Naming aromatic compounds
Benzene and its structure

Redox titrations
Standard electrode potential
Standard cell potentials
Transition metals
Transition metal compounds
Transition metals and complex ions
Stereoisomerism and complex ions
Ligand substitution in complexes
Ligand substitution and precipitation reactions
Redox reactions
Testing for ions

Module 6 Organic Chemistry and Analysis

Redox
Free energy
Entropy
Hydration
Enthalpy change of solution
Born-Haber cycle calculations
Lattice enthalpy
Neutralisation-titration curves
Neutralisation
Buffers
Calculating pH of weak acids
Ionisation of water and K_w
Calculating pH of weak acids

Module 5 Physical chemistry and transition elements

Orders of reaction
Rate equations
Rate constants
Concentration – time graphs
Rate- concentration graphs
Rate- determining steps
Temperature and rate constants
Equilibrium and K_p
Equilibrium constants
Brønsted-Lowry acids and bases
Acid-base reactions and K_a
Calculating pH of strong acids

Year 13
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Combined techniques
Fragmentation patterns
Mass spectroscopy in organic chemistry
Functional groups
Infrared spectroscopy
Synthetic routes in organic synthesis
Practical skills for organic synthesis
Haloalkanes
Other reactions of alcohols

Reaction mechanisms
Properties of alkanes
Reactions of alkanes
Properties of alkenes
Addition reactions of alkenes
Addition polymerisation
Dealing with polymer waste
Properties of alcohols
Oxidation of alcohols

Isomerism
Skeletal formulae
Organic compounds and their formulae
Naming organic chemicals

Module 4 Core Organic Chemistry

Equilibrium
Boltzmann distribution
Catalysts
Collision theory
Hess's law and enthalpy cycles
Bond enthalpies
Calorimetry
Enthalpy terms
Energy profile diagrams
Enthalpy and reactions
Testing for ions

Shapes of molecules and ions
Intermolecular forces
Electronegativity and bond polarity
Hydrogen Bonding

Module 3 The Periodic Table and Energy

The development of the periodic table
The modern periodic table
Electrons and the periodic table
Evidence for electron shells
Periodicity
Group 2 elements
Group 2 compounds
Group 17; the halogens
Acids and bases

Structures of covalent compounds
Dative covalent bonding
Covalent bonding
Structure of ionic compounds
Ionic bonding
Chemical bonding
Sub-shells and energy levels
Shells and orbitals
Redox reactions
Oxidation numbers
Titrations
Formulae for crystals and salts
Salts
Atom economy

Module 2 Foundations in Chemistry

The changing atom
Atomic structure
Atomic masses
Determining masses using mass spectrometry
Ions and the periodic table
Amount of substance
Types of formulae
Moles and gas volumes
Moles and solutions
Chemical equations
Moles and reactions
Percentage yields

Year 12
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