A Level Chemistry KS5: Year 12

CARDINAL NEWMAN CATHOLIC SCHOOL

Term 1.1

Transition from GCSE

Physical 3.1 Atomic structure
Fundamental particles, mass number & isotopes, electronic configuration

Physical 3.1.2 Amount of Substance
Relative atomic & molecular mass, the Mole & Avogadro's number, Ideal gas equation, empirical & molecular formula, balanced equation, reacting masses

Physical 3.1.3 Bonding
Ionic, covalent & dative covalent, metallic, physical properties, molecular & ionic shapes, bond polarity, inter-molecular forces

Term 1.2

Physical 3.1.4 Energetics
Enthalpy changes, calorimetry, Hess's law, bond enthalpies

Organic 3.3.1 Introduction to Organic Chemistry
Nomenclature, isomerism.

3.3.2 Alkanes
Fractional distillation, cracking, combustion, chlorination (free-radical substitution).

Term 2:1

Physical 3.1.5 Kinetics
Collision theory, Maxwell-Boltzmann distribution, effect of temperature on rate.

3.1.6 Equilibria
Le Chatelier's principle, the equilibrium constant, K

Organic 3.3.3 Halogenoalkanes
Nucleophilic substitution, elimination, depletion of the ozone.

3.3.4 Alkenes
Structure, nomenclature & reactivity, addition reaction, polymers

Term 2:2

Inorganic 3.2.1 Periodicity
Trends; atomic radius, 1st ionisation energy.

3.2.2 Group 2 elements
Trends, reaction with water, relative solubilities of Gp2 hydroxides & sulfates, uses of Gp2 compounds, $BaCl_2$ sol^n test for sulfates.

Term 3:1

Inorganic 3.2.3 Group 7
Trends, relative oxidising abilities of the halogens and reducing ability of the halide ions, silver nitrate test to identify halide ions in solution, uses of chlorine & chlorate.

Physical 3.1.7 REDOX
REDOX & electron gain & loss, oxidation states, half-equations.

Term 3:2

Organic 3.3.5 Alcohols
Primary, secondary, tertiary, oxidation, elimination

3.3.6 Analysis
Test-tube reactions, mass spectroscopy, infrared spectroscopy.

OUR LEARNING JOURNEY

A Level Chemistry KS5: Year 13

CARDINAL NEWMAN CATHOLIC SCHOOL

Examinations

Term 3:2

Organic 3.3.15 NMR spectroscopy
^{13}C and ^{1}H NMR spectroscopy.
3.3.16 Chromatography
As a method of separating and identifying components in a mixture, TLC

Revision and Review

Term 3:1

Organic 3.3.13 Amino acids & DNA
Acidic & basic properties, zwitterions, protein structure, enzymes, DNA, action of anti-cancer drugs.
3.3.14 Synthesis
Steps involved in synthesis of organic

Inorganic 3.2.5 Transition metals
General properties, substitution reactions, shapes of complex ions, coloured ions, variable oxidation states, catalysis.
3.2.6 Reactions of aqueous ions
Reactions of Fe, Cu, Al ions in solution.

Term 2:2

Physical 3.1.1 Electrochemical cells
Electrode potentials, simple cells, EMF, commercial applications

Organic 3.3.11 Amines
Preparation, base properties, as nucleophiles
3.3.12 Polymerisation
Condensation polymers, biodegradability

Inorganic 3.2.4 Periodicity
Properties of Period 3 elements & their oxides.

Term 2:1

Physical 3.1.12 Acids & Bases
Bronsted-Lowry definition, pH, K_w, weak acids, titration curves & indicators, buffer
Solutions.

Organic 3.3.9 Carboxylic acid derivatives.
Esters, lipids, acylation, acyl chlorides, acid anhydrides, amides, nucleophilic addition-elimination.
3.3.10 Aromatic
Structure, electrophilic substitution, nitration, Friedel-Crafts acyl

Term 1.2

Physical 3.1.10 Equilibrium constant, K_p
Mole fraction, partial pressures, calculating K_p
3.1.8 Thermodynamics
Enthalpy changes, the Born-Haber cycle, entropy and Gibb's free energy change.

Organic 3.3.7 Optical isomerism
Ionic, covalent & dative covalent, metallic, physical properties, molecular & ionic shapes, bond polarity, inter-molecular forces
3.3.8 Aldehydes & ketones
Chemical tests, reduction, nucleophilic addition

START

Term 1.1

OUR LEARNING JOURNEY

A Level Chemistry

CARDINAL NEWMAN CATHOLIC SCHOOL

Year 13 Term 3

Organic
3.3.15 NMR spectroscopy
3.3.16 Chromatography

Revision and Review

Examinations

Year 13 Term 2

Physical
3.1.1 Electrochemical cells

Organic
3.3.11 Amines
3.3.12 Polymerisation
3.3.13 Amino acids & DNA
3.3.14 Synthesis

Inorganic
3.2.4 Periodicity
3.2.5 Transition metals
3.2.6 Reactions of aqueous ions

Year 13 Term 1

Physical
3.1.10 Equilibrium constant, K_p
3.1.8 Thermodynamics
3.1.12 Acids & Bases

Organic
3.3.7 Optical isomerism
3.3.8 Aldehydes & ketones
3.3.9 Carboxylic acid derivatives
3.3.10 Aromatic

Year 12 Term 3

Organic
3.3.5 Alcohols
3.3.6 Analysis

Physical
3.1.9 Rate equations

Inorganic
3.2.1 Periodicity
3.2.2 Group 2 elements
3.2.3 Group 7

Physical
3.1.5 Kinetics
3.1.6 Equilibria
3.1.7 REDOX

Organic
3.3.3 Halogenoalkanes
3.3.4 Alkenes

Year 12 Term 2

Transition from GCSE

Physical
3.1 Atomic structure
3.1.2 Amount of Substance
3.1.3 Bonding
3.1.4 Energetics

Organic
3.3.1 Introduction to Organic Chemistry
3.3.2 Alkanes

Year 12 Term 1

START

OUR LEARNING JOURNEY

A Level Chemistry KS5: Year 12 (Paper 1)

CARDINAL NEWMAN CATHOLIC SCHOOL

Term 3:2

Inorganic 3.2.6 Reactions of inorganic compounds in aqueous solutions.
The acid-base chemistry of aqueous transition metal ions, ligand substitution.

Physical 3.1.12 Acids, bases and buffers
PH scale, weak acids and bases, acid-base titrations, buffer solutions

Inorganic 3.2.5 Transition metals
General properties, complex formation, colour ions, variable oxidations ates

Term 3:1

Physical 3.1.8 Thermodynamics
Enthalpy changes, the Born-Haber cycle, entropy and Gibb's free energy change.

Physical 3.1.10 Equilibrium constant, Kp
For homogenous systems

Physical 3.1.11 Electrode potential and electrochemical cells
Electrochemical cells, redox reactions, electrochemical cells

Term 2:2

Inorganic 3.2.2 Group 2 elements
Trends, reaction with water, relative solubilities of Gp2 hydroxides & sulfates, uses of Gp2 compounds, $BaCl_2$ sol^n test for sulfates.

Inorganic 3.2.3 Group 7
Trends, relative oxidising abilities of the halogens and reducing ability of the halide ions, silver nitrate test to identify halide ions in solution, uses of chlorine & chlorate.

Inorganic 3.2.4 Period 3
Reactions of Period 3 elements, oxides of elements in Period 3, acidic/basic nature of the Period 3 oxides

Term 2:1

Physical 3.1.4 Energetics
Enthalpy changes, calorimetry, Hess's law, bond enthalpies

Physical 3.1.6 Equilibria
Le Chatelier's principle, the equilibrium constant, Kc

Physical 3.1.7 REDOX
REDOX & electron gain & loss, oxidation states, half-equations.

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Term 1.1

OUR LEARNING JOURNEY