Chemistry KS5: Year 12

CARDINAL NEWMAN CATHOLIC SCHOOL

OUR LEARNING JOURNEY

AUTUMN 1:1

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

AUTUMN 1:2

Organic
3.3.1 Introduction to Organic Chemistry
Nomenclature, isomerism.
3.3.2 Alkanes
Fractional distillation, cracking, combustion, chlorination (free-radical substitution).

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

SPRING 2:1

Organic
3.3.3 Halogenoalkanes
Nucleophilic substitution, elimination, depletion of the ozone.
3.3.4 Alkenes
Structure, nomenclature & reactivity, addition reaction, polymers

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_c

SPRING 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.

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

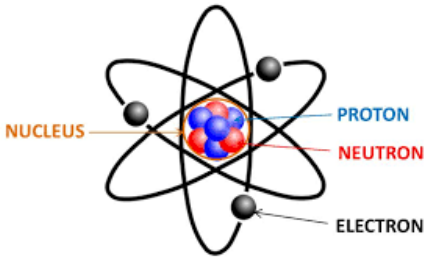
SUMMER 3:1

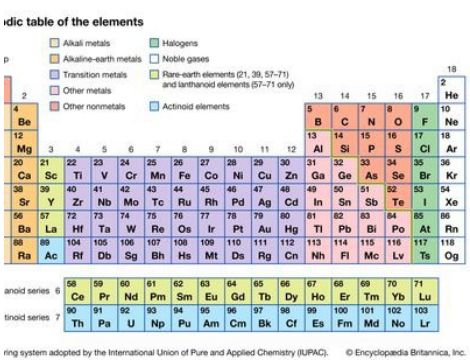
Inorganic
3.2.3 Group 7
Trends, relative oxidising abilities of the halogens and reducing ability of the halide ions, silver nitrate test to identify halide ions in solution, uses of chlorine & chlorate.

SUMMER 3:2

Organic
3.3.5 Alcohols
Primary, secondary, tertiary, oxidation, elimination
3.3.6 Analysis
Test-tube reactions, mass spectroscopy, infrared spectroscopy.

Physical
3.1.9 Rate equations
Rate equations and the rate constant, the Arrhenius equation, determination of rate of reaction from experiment, order of reaction, rate determining step (RDS).





Chemistry KS5: Year 13

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AUTUMN 1:1

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

Physical
3.1.10 Equilibrium constant, K_p
Mole fraction, partial pressures, calculating K_p.

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

AUTUMN 1:2

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

SPRING 2:1

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

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

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

SPRING 2:2

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.

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

SUMMER 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 compounds.

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

SUMMER 3:2

Revision & Review