Chemistry KS5: Year 12

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).

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.

Organic

3.3.5 Alcohols

Primary, secondary, tertiary, oxidation, elimination

3.3.6 Analysis

Test-tube reactions, mass spectroscopy, infrared spectroscopy.

Organic 3.3.5 Alcohols

Primary, secondary, tertiary, oxidation, elimination

SUMMER

3:2

3.3.6 Analysis

Test-tube reactions, mass spectroscopy, infrared spectroscopy.

SUMMER 3:1

Inorganic 3.2.1 Periodicity

Trends; atomic radius, 1st ionisation

3.2.2 Group 2 elements

Trends, reaction with water, relative solubilities of Gp2 hydroxides & sulfates, uses of Gp2 compounds, BaCl₂ solⁿ test for sulfates.

SPRING 2:2

Physical 3.1.7 REDOX

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

Organic

3.3.3 Halogenoalkanes

Nucleophilic substitution, elimination, depletion of the ozone.

3.3.4 Alkenes

Structure, nomenclature & reactivity, addition reaction, polymers

SPRING

2:1

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

> **AUTUMN** 1:2

distribution, effect of temperature on

Physical

3.1.5 Kinetics

Collision theory, Maxwell-Boltzmann

3.1.6 Equilibria

Le Chatelier's principle, the equilibrium constant, K_c

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

Physical 3.1 Atomic structure

Fundamental particles, mass number & isotopes, electronic configuration,

3.1.3 Bonding

Ionic, covalent & dative covalent, metallic, physical properties, molecular & ionic shapes, bond polarity, intermolecular forces

Physical

AUTUMN 1:1

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Chemistry KS5: Year 13





SUMMER

3:2

Organic

3.3.15 NMR spectroscopy

¹³C and ¹H NMR spectroscopy.

3.3.16 Chromatography

As a method of separating and identifying components in a mixture, TLC

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.

Inorganic 3.2.4 Periodicity

Properties of Period 3 elements & their oxides.

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.

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

SPRING

2:1

Organic 3.3.9 Carboxylic acid derivitives.

Esters, lipids, acylation, acyl chlorides, acid anhydrides, amides, nucleophilic additioneliminiation.

3.3.10 Aromatic

Structure, electrophilic substitution, nitration, Friedel-Crafts acylation

Physical 3.1.12 Acids & Bases

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

AUTUMN 1:2

Physical

3.1.8 Thermodynamics

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

AUTUMN 1:1

Physical 3.1.10 Equilibrium constant, K_n

Mole fraction, partial pressures, calculating K_n

Organic

3.3.7 Optical isomerism

Ionic, covalent & dative covalent, metallic, physical properties, molecular & ionic shapes, bond polarity, intermolecular forces

3.3.8 Aldehydes & ketones

Chemical tests, reduction, nucleophilic addition

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