

A Level Chemistry Resource Pack

Below is a collection of curriculum specific broadcast material, sorted by exam board and then study theme. The document will be updated as new content is added and old content is removed.

OCR

Development of Practical Skills in Chemistry - Planning; implementing; analysis; evaluation; practical skills; use of apparatus and techniques

Foundations in Chemistry - Atoms and reactions; atomic structures and isotopes; relative mass; compounds, formulae and equations; amount of substance; determination of formulae; calculation of reacting masses, gas volumes and mole concentrations; percentage yields and atom economy; acids, bases, alkalis and neutralisation; acid-base titrations; redox; oxidation number; redox reactions; electrons, bonding and structure; electron structure; energy levels, shells, sub-shells, atomic orbitals, electron configuration; bonding and structure; ionic bonding; covalent bonding; the shapes of simple molecules and ions; electronegativity and bond polarity; intermolecular forces.

- <https://www.bbc.co.uk/programmes/b09zt3mr> - BBC Radio 4 – In Our Time – The Proton
- <https://www.bbc.co.uk/programmes/p03jrx6f> - BBC World Service – Discovery – Examining the Atom
- <https://www.bbc.co.uk/programmes/p03jrwyx> - BBC World Service – A Sub-Atomic Particle
- <https://www.bbc.co.uk/programmes/p035xjsy> - BBC World Service – The Scale of Things – Microscopic World of the Atom
- <https://www.bbc.co.uk/programmes/p02y9rp9> - BBC World Service – Elements – Oxygen (O) – Oxidation
- <https://www.bbc.co.uk/programmes/b00d8yw8> - BBC Radio 4 – Big Bang Day: Five Particles

Periodic Table and Energy - the periodic table; periodicity; the structure of the periodic table; periodic trend in electron configuration and ionisation energy; periodic trend in structure and melting point; group 2; redox reactions and reactivity of Group 2 metals, reactions of Group 2 compounds; the halogens; characteristic physical properties; redox reactions and reactivity of halogens and their compounds; characteristic reactions of halide ions; PAG4; tests for ions

- <https://www.bbc.co.uk/programmes/w3cvsfm> - BBC World Service – The Forum – The Alphabet of Chemistry
- <https://www.bbc.co.uk/programmes/p00546sz> - BBC Radio 4 – In Our Time – Chemical Elements

Core Organic Chemistry - Basic concepts and hydrocarbons; basic concepts of organic chemistry; naming and representing the formulae of organic compounds; functional groups; isomerism; reaction mechanisms; alkanes; properties of alkanes; reactions of alkanes; stereoisomerism in alkenes; addition reactions of alkenes; polymers from alkenes; waste polymers and alternatives; alcohols, haloalkenes and analysis; alcohols; organic synthesis; mass spectrometry

- <https://www.bbc.co.uk/programmes/b049yhcn> - BBC Radio 4 – The Life Scientific – Carol Robinson on Chemistry

Physical Chemistry and Transition Elements - Enthalpy changes; bond enthalpies; Hess' law and enthalpy cycles; reaction rates; catalysts; the Boltzmann distribution; chemical equilibrium; rates, equilibrium and pH; order rate equations and rate constants; rate graphs and orders; rate-determining step; effect of temperature on rate constants; equilibrium; acids, bases and buffers; bronsted-lowry acids and bases; buffers: action, uses and calculations; neutralisation; energy; lattice enthalpy; enthalpy and entropy; redox and electrode potentials; transition elements; properties; ligands and complex ions; ligand substitution; precipitation reactions; redox reactions; qualitative analysis

- <https://www.bbc.co.uk/programmes/p03n87w8> - BBC World Service – Elements – Series

Organic Chemistry and Analysis - Aromatic compounds; benzene; electrophilic substitution; phenols; carbonyl compounds; characteristic tests for carbonyl compounds; carboxylic acids and esters; acyl chlorides; nitrogen compounds, polymers and synthesis; amines; amino acids, amides and chirality; polyesters and polyamides; carbon-carbon bond formation; organic synthesis; chromatography; spectroscopy; NMR Spectroscopy;

- <https://www.bbc.co.uk/programmes/p03jrwr0> - BBC World Service – Discovery – What Chemicals Came First?
- <https://www.bbc.co.uk/programmes/b083n2jg> - BBC Radio 4 – The Life Scientific – Julia Higgins on Polymers
- <https://www.bbc.co.uk/programmes/b06z4w7p> - BBC Radio 4 – In Our Time – Chromatography

AQA

Physical Chemistry - atomic structure; amount of substance - atomic mass and relative molecular mass, the ideal gas equation, empirical and molecular formula; bonding; energetics; kinetics; chemical equilibria, Le Chatelier's principle and K_c ; oxidation, reduction and redox equations; thermodynamics; rate equations; equilibrium constant K_p for homogenous systems; electrode potentials and electrochemical cells; acids and bases.

- <https://www.bbc.co.uk/programmes/b09zt3mr> - BBC Radio 4 – In Our Time – The Proton
- <https://www.bbc.co.uk/programmes/p03jrx6f> - BBC World Service – Discovery – Examining the Atom
- <https://www.bbc.co.uk/programmes/p03jrwyx> - BBC World Service – A Sub-Atomic Particle
- <https://www.bbc.co.uk/programmes/p035xjsy> - BBC World Service – The Scale of Things – Microscopic World of the Atom
- <https://www.bbc.co.uk/programmes/p02y9rp9> - BBC World Service – Elements – Oxygen (O) – Oxidation
- <https://www.bbc.co.uk/programmes/b00d8yw8> - BBC Radio 4 – Big Bang Day: Five Particles

Inorganic Chemistry - Periodicity; the alkaline earth materials; group 7(17), the halogens; properties of Period 3 elements and their oxides; transition metals; catalysts; reactions of ions in aqueous solution.

- <https://www.bbc.co.uk/programmes/w3cvsfm> - BBC World Service – The Forum – The Alphabet of Chemistry
- <https://www.bbc.co.uk/programmes/p00546sz> - BBC Radio 4 – In Our Time – Chemical Elements

Organic Chemistry - introduction to organic chemistry; alkanes; halogenoalkanes; alkenes; alcohols; organic analysis; optical isomerism; aldehydes and ketones; carboxylic acids and derivatives; aromatic chemistry; amines; polymers; amino acids, proteins and DNA; organic synthesis; nuclear magnetic resonance spectroscopy; chromatography;

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- <https://www.bbc.co.uk/programmes/b083n2jg> - BBC Radio 4 – The Life Scientific – Julia Higgins on Polymers
- <https://www.bbc.co.uk/programmes/b06z4w7p> - BBC Radio 4 – In Our Time – Chromatography
- <https://www.bbc.co.uk/programmes/b09tdr0r> - BBC Radio 4 – The Life Scientific – Clare Grey on the Big Battery Challenge (nuclear magnetic resonance)
- <https://www.bbc.co.uk/programmes/p04dnmpd> - BBC World Service – The Forum – DNA: The Code for Making Life
- <https://www.bbc.co.uk/programmes/p0376qrt> - BBC World Service – Science View – DNA and Genes
- <https://www.bbc.co.uk/programmes/p02yv3hr> - BBC World Service – Business Daily – Elements: Hydrogen and Acids

Edexcel

Atomic Structure and the Periodic Table

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- <https://www.bbc.co.uk/programmes/p00546sz> - BBC Radio 4 – In Our Time – Chemical Elements

Bonding and Structure

Redox - investigating some electrochemical cells; redox titration.

Inorganic Chemistry and the Periodic Table

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Formulae, Equations and Amounts of Substance

Organic Chemistry - alkanes; alkenes; halogenoalkenes; investigation of the rates of hydrolysis of some halogenoalkenes; alkenes; the oxidation of ethanol; chlorination of 2-methylpropan-2-ol using concentrated hydrochloric acid. Chirality; carbonyl compounds; carboxylic acids; arenes - benzene; amines, amides, amino acids and proteins; analysis of some inorganic and organic unknowns; organic synthesis; the preparation of aspirin

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- <https://www.bbc.co.uk/programmes/p0376qrt> - BBC World Service – Science View – DNA and Genes
- <https://www.bbc.co.uk/programmes/p03jrwr0> - BBC World Service – Discovery – What Chemicals Came First?
- <https://www.bbc.co.uk/programmes/p03kc6k6> - BBC World Service – Drugs that Changed the World – Aspirin

Modern Analytical Techniques - Mass spectrometry; infrared (IR) spectroscopy; analysis of some inorganic and organic unknowns; nuclear magnetic resonance; chromatography.

- <https://www.bbc.co.uk/programmes/b06z4w7p> - BBC Radio 4 – In Our Time – Chromatography
- <https://www.bbc.co.uk/programmes/b09tdr0r> - BBC Radio 4 – The Life Scientific – Clare Grey on the Big Battery Challenge (nuclear magnetic resonance)
- <https://www.bbc.co.uk/programmes/b049yhcn> - BBC Radio 4 – The Life Scientific – Carol Robinson on Chemistry (Mass Spectrometry)

Energetics - determine the enthalpy change of a reaction using Hess' Law; Lattice energy; entropy

Kinetics - Rates of reaction; following the rate of the iodine-propanone reaction by a titrimetric method and investigating a 'clock reaction' (Harcourt-Esson, iodine clock); finding the activation energy of a reaction.

Equilibrium

Acid-Based Equilibria - find the K_a value for a weak acid.

Transition Metals - Principles of transition metal chemistry; reactions of transition metal elements; the preparation of a transition metal complex,

WJEC

The Language of Chemistry, Structure of Matter and Simple Reactions - Formulae and equations; basic ideas about atoms; chemical calculations; bonding; solid structures; the Periodic Table; simple equilibria and acid-base reactions.

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- <https://www.bbc.co.uk/programmes/p00546sz> - BBC Radio 4 – In Our Time – Chemical Elements

Energy, Rate and Chemistry of Carbon Compounds - Thermochemistry; rates of reaction; the wider impact of chemistry; organic compounds; hydrocarbons; halogenoalkenes; alcohols and carboxylic acids; instrumental analysis.

Physical and Inorganic Chemistry - Redox and standard electrode potential; redox reactions; chemistry of the p-block; chemistry of the d-block transition metals; chemical kinetics; enthalpy changes for solids and solutions; entropy and feasibility of reactions; equilibrium constants; acid-base equilibria.

Organic Chemistry and Analysis - stereoisomerism; aromaticity; alcohols and phenols; aldehydes and ketones; carboxylic acids and their derivatives; amines; amino acids, peptides and proteins; organic synthesis and analysis.

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- <https://www.bbc.co.uk/programmes/p0376qrt> - BBC World Service – Science View – DNA and Genes
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Practical - Experimental task; practical methods and analysis task.

CCEA

Basic Concepts in Physical and Inorganic Chemistry - formulae, equations and amounts of substance; atomic structure; bonding; intermolecular forces; structure; shapes of molecules and ions; redox; halogens; acid-base titrations; qualitative tests.

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- <https://www.bbc.co.uk/programmes/p03jrwyx> - BBC World Service – A Sub-Atomic Particle
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Further Physical and Inorganic Chemistry and an Introduction to Organic Chemistry - formulae and amounts of a substance; nomenclature and isomerism in organic compounds; alkanes; alkenes; halogenoalkanes; alcohols; infrared spectroscopy; energetics; kinetics; equilibrium; Group II elements and their compounds.

- <https://www.bbc.co.uk/programmes/b049yhcn> - BBC Radio 4 – The Life Scientific – Carol Robinson on Chemistry (Mass Spectrometry)

Basic Practical Chemistry

Further Physical and Organic Chemistry - lattice enthalpy; enthalpy, entropy and free energy; rates of reaction; equilibrium; acid-base equilibria; isomerism; aldehydes and ketones; carboxylic acids; derivatives of carboxylic acids; aromatic chemistry

Analytical, Transition Metals, Electrochemistry and Organic Nitrogen Chemistry - Mass spectrometry; nuclear magnetic resonance spectroscopy; volumetric analysis; chromatography; transition metals; electrode potentials; amines; amides; amino acids; polymer chemistry; chemistry in medicine.

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Further Practical Chemistry