

Chemistry

Unit 1 – Paper 1

- 1. Atomic structure**
(Atoms, chemical equations, separating mixtures, fractional distillation and paper chromatography, history of atom, atoms, ions, isotopes, electronic structures)
- 2. The periodic table**
(development of periodic table, electronic structure and periodic table, group 1, group 7, *transition elements*)
- 3. Structure and bonding**
(states of matter, ionic bonding, giant ionic structures, covalent bonding, structure of simple molecules, giant covalent structures, fullerenes and graphene, bonding in metals, giant metallic structures, *nanoparticles*)
- 4. Chemical calculations**
(relative masses and moles, **equations and calculations, from masses to balanced equations**, *yield of a chemical reactions, atom economy*, expressing concentrations, *titrations and calculations, volumes of gases*)
- 5. Chemical changes**
(reactivity series, displacement reactions, extracting metals, salts from metals, neutralisation and the pH scale, **strong and weak acids**)
- 6. Electrolysis**
(electrolysis, changes at the electrodes, extraction of aluminium, electrolysis of aqueous solutions)
- 7. Energy changes**
(exothermic and endothermic reactions, reaction profiles, **bond energy calculations**, *chemical cells and batteries, fuel cells*)

Unit 2 – Paper 2

- 8. Rates and equilibrium**
(Rates of reaction, collision theory and surface area, temperature, concentration and pressure, catalysts, reversible reactions, energy and reversible reactions, dynamic equilibrium, **altering conditions**)
- 9. Crude oil and fuels**
(hydrocarbons, fractional distillation, combustion, cracking)
- 10. Organic reactions**
(*reactions of alkenes, structure of alcohols, carboxylic acids and esters, reactions and uses of alcohols*)
- 11. Polymers**
(*addition polymerisation, condensation polymerisation, natural polymers, DNA*)
- 12. Chemical analysis**
(pure substances and mixtures, analysing chromatograms, testing for gases, *tests for positive ions, tests for negative ions, instrumental analysis*)
- 13. The Earth's atmosphere**
(history of atmosphere, evolving atmosphere, greenhouse gases, global climate change, atmospheric pollutants)
- 14. The Earth's resources**
(finite and renewable resources, drinking water, treating waste water, **extracting metals from ores**, life cycle assessments, reduce, reuse, recycle)
- 15. Using our resources**
(*rusting, useful alloys, properties of polymers, glass, ceramics and composites, making ammonia- Haber process, economics of Haber process, making fertilisers in the lab and industry*)

Key:

In colour: Separate science only

In bold: Higher only