

Year 10 Chemistry Topics

SC8 Acids and Alkalis - Paper 1

In this unit we explore the nature of acidic and alkaline solutions, and investigate their most important reactions properties and uses.

Builds upon:

From KS3:

- Solubility, solutes, solvents and solutions
- Common international hazard symbols
- The use of indicators to test the pH of solutions
- What happens during simple neutralisation reactions

From KS4 SC5-7

- Ionic and covalent bonding and properties
- Ionic formula

Introduces:

- The ions in acids and alkalis and how their concentrations are linked to pH
- The reactions between acids and different types of bases
- Different indicators that can be used in titrations
- How soluble and insoluble salts can be prepared in the laboratory
- Balancing chemical equations

Assessment

- End of topic test
- Six mark question

SC9 Calculations involving Masses - Paper 1 and 2

This unit will help you to use relative atomic masses to calculate relative formula masses of elements and compounds, calculate the concentration of a solution and work out empirical and molecular formulae of compounds.

Builds upon:

From KS3:

- How to represent elements and compounds using symbols
- How mass is conserved during changes of state and chemical reactions
- How to show chemical reactions using equations

From KS4 SC3-4 and SC8:

- Balancing equations
- Using the periodic table
- Relative atomic mass

Introduces:

- How to calculate relative formula masses of elements and compounds
- How to work out empirical and molecular formulae of compounds
- How to calculate the mass of reactants or products in a reaction
- How to calculate the concentration of a solution
- The Avogadro constant (H)

Assessment

- End of topic test
- Six mark question

SC10-13 Electrolytic Processes / Metals / Reversible Reactions and Equilibria - Paper 1

This unit will help you learn more about reactivity, oxidation and reduction, the advantages of recycling, about the Haber process and what happens during electrolysis.

Builds upon:

From KS3:

- Oxidation and displacement reactions
- The reactivity series

From KS4 SC4, SC5 and SC8:

- Anions and cations in ionic compounds
- Writing balanced chemical equations with state symbols
- How the elements are arranged in the periodic table

Introduces:

- More about reactivity, oxidation and reduction
- How metals can be extracted
- The advantages of recycling metals
- The factors involved in a life-cycle assessment of a product
- What happens during electrolysis and electroplating
- Equilibria in chemical reactions
- The Haber process
- Half equations (H)
- Properties of transition metals
- Properties and uses of metals and their alloys

Assessment

- End of topic test
- Six mark question

SC14-16 Quantitative Analysis/Dynamic Equilibria/Calculations involving volumes of gases/Chemical and fuel cells - Paper 1

This unit will help you learn more about calculations involving masses, volumes and moles and about industrial processes and how chemicals are used to store energy.

Builds upon:

From KS3:

- Law of conservation of mass

From KS4 SC8, SC9 and SC10-13:

- Reacting mass calculations
- Acid and base reactions
- Concentration calculations
- Moles calculations
- Dynamic equilibrium
- Oxidation and reduction

Introduces:

- Calculate percentage yield
- Reasons why actual yield is less than theoretical yield
- Calculate atom economy
- Carry out an acid-alkali titration
- Calculate an unknown concentration or volume of a solution using titration
- Factors that are considered when selecting a manufacturing method
- Interconverting between gdm^{-3} and mol dm^{-3}

Assessment

- End of topic test
- Six mark question

SC17-19 Groups / Rates of Reaction / Heat Energy Changes in Reactions - Paper 2

This unit looks at some typical reactions of certain elements and general ideas about how chemical reactions can be controlled and used.

Builds upon:

From KS3:

- Elements, compounds and the periodic table
- What happens during chemical reactions

From KS4 SC3, SC5 and SC8:

- The nature of atoms and ions
- Writing balanced chemical equations including state symbols

Introduces:

- The properties and reactions of the elements in groups 1, 7 and 0
- How changes in conditions can affect the rates of reactions
- The energy transfers that can occur during chemical reactions

Assessment

- End of topic test
- Six mark question

Year 11 Chemistry Topics

SC20-21 Fuels / Earth and Atmospheric Science - Paper 2

This section introduces you to crude oils and natural gas, hydrocarbons, fractional distillation, the alkane homologous series, combustion, pollution, the earth's atmosphere and climate change.

Builds upon:

From KS3:

- That mixtures may be separated using fractional distillation
- Fuels and energy resources
- The acidity of non-metal oxides
- The production of carbon dioxide by human activity and the impact on climate

From KS4 in SC5-7 and SC8:

- Covalent bonding and properties
- Balancing equations

Introduces:

- The hydrocarbons found in crude oil and natural gas
- How crude oil is separated into useful fractions
- The alkanes as an homologous series
- The problems caused by some atmospheric pollutants
- The cracking of oil fractions
- The advantages and disadvantages of different fuels for cars
- How the Earth's atmosphere has changed in the past and how it is changing now
- More about the causes and effects of climate change

Assessment

- End of topic test
- Six mark question

SC22-24 Hydrocarbons/Alcohols and Carboxylic acids/Polymers - Paper 2

This section introduces you to the properties and reactions of alkanes, alkenes, alcohols, carboxylic acids and polymers.

Builds upon:

From KS3:

- Combustion of fuels
- Properties of polymers

From KS4 SC6, SC8 and SC20-21:

- Hydrocarbons as fuels
- Covalent bonding
- Acid-base reactions

Introduces:

- Structures and properties of alkanes and alkenes
- How concentrated solution of ethanol is produced from carbohydrates
- Structures of alcohols and carboxylic acids
- Chemical properties and uses of alcohols and carboxylic acids
- Composition of biological polymers
- How poly(ethene) and other polymers are made
- Disposal and recycling of polymers

Assessment

- End of topic test
- Six mark question

SC25-26 Qualitative Analysis/Tests of ions/Bulk and surface properties of matter including nanoparticles - Paper 2

This section introduces you to identifying unknown ionic compounds and the properties of different materials.

Builds upon:

From KS3:

- Some properties of ceramics, polymers, metals and composite materials

From KS4 SC5 and SC22-24

- Anions and cations
- Polymers

Introduces:

- How to identify metal ions
- The chemical tests for various non-metal ions and for ammonia gas
- Instrumental methods of analysis and their advantages
- Compare the physical properties of different materials
- Composite materials
- Why materials are chosen for a certain use
- Nanoparticles and their properties, uses and possible risks

Assessment

- End of topic test
- Six mark question

