**SPECIFICATION OVERVIEW**

**AQA AS LEVEL CHEMISTRY (7404)**

**SUBJECT CONTENT**

**1. Physical chemistry**

1.1 Atomic structure

1.1.1 Fundamental particles

1.1.2 Mass number and isotopes

1.1.3 Electron configuration

1.2 Amount of substance

1.2.1 Relative atomic mass and relative molecular mass

1.2.2 The mole and the Avogadro constant

1.2.3 The ideal gas equation

1.2.4 Empirical and molecular formula

1.2.5 Balanced equations and associated calculations

1.3 Bonding

1.3.1 Ionic bonding

1.3.2 Nature of covalent and dative covalent bonds

1.3.3 Metallic bonding

1.3.4 Bonding and physical properties

1.3.5 Shapes of simple molecules and ions

1.3.6 Bond polarity

1.3.7 Forces between molecules

1.4 Energetics

1.4.1 Enthalpy change

1.4.2 Calorimetry

1.4.3 Applications of Hess’s law

1.4.4 Bond enthalpies

1.5 Kinetics

1.5.1 Collision theory

1.5.2 Maxwell–Boltzmann distribution

1.5.3 Effect of temperature on reaction rate

1.5.4 Effect of concentration and pressure

1.5.5 Catalysts

1.6 Chemical equilibria, Le Chatelier’s principle and *K*c

1.6.1 Chemical equilibria and Le Chatelier's principle

1.6.2 Equilibrium constant *K*c for homogeneous systems

1.7 Oxidation, reduction and redox equations

**2. Inorganic chemistry**

2.1 Periodicity

2.1.1 Classification

2.1.2 Physical properties of Period 3 elements

2.2 Group 2, the alkaline earth metals

2.3 Group 7(17), the halogens

2.3.1 Trends in properties

2.3.2 Uses of chlorine and chlorate(I)

**3. Organic chemistry**

3.1 Introduction to organic chemistry

3.1.1 Nomenclature

3.1.2 Reaction mechanisms

3.1.3 Isomerism

3.2 Alkanes

3.2.1 Fractional distillation of crude oil

3.2.2 Modification of alkanes by cracking

3.2.3 Combustion of alkanes

3.2.4 Chlorination of alkanes

3.3 Halogenoalkanes

3.3.1 Nucleophilic substitution

3.3.2 Elimination

3.3.3 Ozone depletion

3.4 Alkenes

3.4.1 Structure, bonding and reactivity

3.4.2 Addition reactions of alkenes

3.4.3 Addition polymers

3.5 Alcohols

3.5.1 Alcohol production

3.5.2 Oxidation of alcohols

3.5.3 Elimination

3.6 Organic analysis

3.6.1 Identification of functional groups by test-tube reactions

3.6.2 Mass spectrometry

3.6.3 Infrared spectroscopy