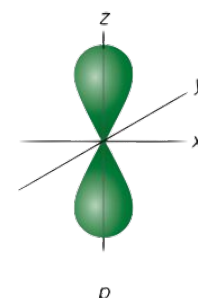
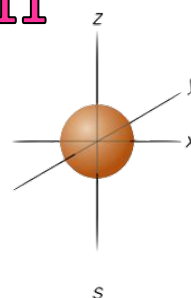


Preliminary Chemistry Course – Year 11

Module 1: Properties and Structure of Matter

- Atoms, elements and mixtures
- The Periodic Table
- The properties and classification of elements and compounds
- Separation techniques
- The bonding of atoms in elements and compounds
- IUPAC nomenclature
- Isotopes and radiation
- Electron configurations
- Allotropes



Module 2: Introduction to Quantitative Chemistry

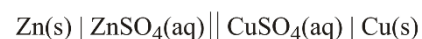
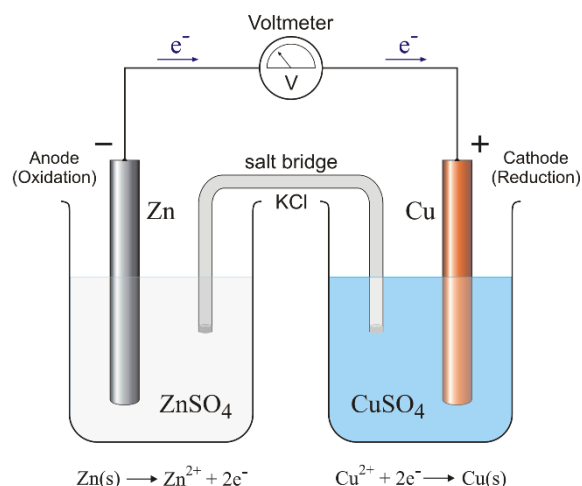
- Chemical reactions and stoichiometry
- Balancing chemical equations
- The mole concept, concentration and molarity
- Calculations for concentration, mass and volume, and dilutions
- The Ideal Gas Law, Avogadro's Law, Gay-Lussac's Law, Boyle's Law and Charles' Law

Module 3: Reactive Chemistry

- Chemical reactions
- Reaction of metals and the reactivity series
- Oxidation, reduction and galvanic cells
- Ionic equations and half-equations
- Rates of reactions and collision theory

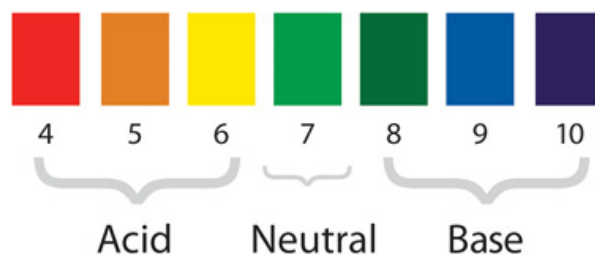
Module 4: Drivers of Reactions

- Energy changes in chemical reactions
- Energy profile diagrams
- Calculations for heat of solution and heat of combustion
- Enthalpy and Hess's Law
- Entropy and Gibbs Free Energy



HSC Chemistry Course – Year 12

Universal Indicator pH Color Chart



Module 5: Equilibrium and Acid Reactions

- *Equilibrium and Le Chatelier's principle*
- *Calculating the equilibrium constant K_{eq}*
- *Dissolution of ionic compounds in water*
- *Solution equilibria and K_{sp} calculations*

Module 6: Acid/Base Reactions

- *Nomenclature and properties of acids and bases*
- *Using Brønsted–Lowry theory*
- *Enthalpy of neutralisation*
- *Calculation of pH, pOH, K_a and pK_a*
- *Acid-base titration for quantitative analysis*
- *Properties of buffers*

Module 7: Organic Chemistry

- *Nomenclature and properties of alkanes, alkenes, alkynes, alcohols (primary, secondary and tertiary), aldehydes, ketones, carboxylic acids, amines, amides and halogenated organic compounds*
- *Position, chain and functional group isomers*
- *Structure and reactivity of hydrocarbons*
- *Production and properties of alcohols*
- *Properties of organic acids and bases*
- *Organic synthesis reaction pathways*
- *Properties and uses of polymers*

Module 8: Applying Chemical Ideas

- *Analysis of inorganic substances*
- *Monitoring ions in the environment*
- *Investigations using flame tests, gravimetric analysis and colourimetry*
- *Ultraviolet-visible spectrophotometry and atomic absorption spectroscopy*
- *Analysis of organic substances, proton and carbon-13 NMR, mass spectrometry and infrared spectroscopy*
- *Chemical synthesis and design*

