

Chemistry Units 1 & 2

Contents

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Series contents

This series comprises **sixteen content workbooks**, cumulative **topic tests**, and a **practice-examination booklet**, covering the complete VCAA Chemistry Units 1 & 2 course. Each content workbook follows the same structure: concise theory, scaffolded and unscaffolded worked examples, graded practice questions, a compact answer key, and fully-worked solutions. Each topic test comprises **Test A** (multiple-choice) and **Test B** (short- and extended-answer), taken under scientific-calculator conditions with the Chemistry Data Sheet, cumulative over the chapters of that Area of Study.

Unit 1: How can the diversity of materials be explained?

Area of Study 1 — How do the chemical structures of materials explain their properties and reactions?

Chapter 1 — Elements and the periodic table (34 pp)

1A Introduction to the elements · 1B Electron configurations · 1C The periodic table and periodic trends · 1D Critical elements and recycling

Chapter 2 — Covalent substances (40 pp)

2A Representing covalent compounds · 2B Molecular shapes and polarity · 2C Properties of covalent compounds and intermolecular forces · 2D Covalent network (lattice) substances

Chapter 3 — Metals (32 pp)

3A Metallic structure and properties · 3B Reactivity of metals · 3C Extraction and recycling of metals

Chapter 4 — Ionic compounds (33 pp)

4A Formation and naming of ionic compounds · 4B Structure and properties of ionic compounds · 4C Precipitation reactions

Chapter 5 — Separating and identifying compounds in mixtures (37 pp)

5A Polarity and solubility · 5B Chromatography

Topic 1 Test A (multiple-choice) and Test B (short and extended response), with fully-worked solutions, are included at the end of this workbook.

Area of Study 2 — How are materials quantified and classified?

Chapter 6 — Quantifying atoms and compounds (28 pp)

6A Relative atomic and isotopic mass · 6B The mole · 6C Percentage composition and empirical formula

Chapter 7 — Organic compounds (46 pp)

7A Organic chemistry in society · 7B Hydrocarbons · 7C Haloalkanes · 7D Alcohols and carboxylic acids

Chapter 8 — Polymers (39 pp)

8A Polymerisation reactions · 8B Polymers and society

Topic 2 Test A (multiple-choice) and Test B (short and extended response), with fully-worked solutions, are included at the end of this workbook.

Area of Study 3 — How can chemical principles be applied to create a more sustainable future?

Chapter 9 — Research investigations (34 pp)

9A Investigation design · 9B Scientific evidence · 9C Communicating chemistry

Unit 2: How do chemical reactions shape the natural world?

Area of Study 1 — How do chemicals interact with water?

Chapter 10 — Water and the properties of water (21 pp)

10A Water on Earth · 10B Properties of water

Chapter 11 — Acids and bases (63 pp)

11A Introduction to acids and bases · 11B Strong and weak acids and bases · 11C Calculating pH · 11D Carbon dioxide as a weak acid · 11E Neutralisation reactions

Chapter 12 — Redox reactions (63 pp)

12A Reduction and oxidation · 12B Writing redox equations · 12C Metal displacement reactions · 12D Applications of redox reactions

Topic 3 Test A (multiple-choice) and Test B (short and extended response), with fully-worked solutions, are included at the end of this workbook.

Area of Study 2 — How are chemicals measured and analysed?

Chapter 13 — Measuring solubility and concentration (46 pp)

13A Measures of solubility and concentration · 13B Predicting solubility · 13C Purifying water · 13D Volumetric analysis

Chapter 14 — Analysis of salts in water (33 pp)

14A Sources of salts and salinity · 14B Gravimetric analysis · 14C Analysis by colorimetry and UV-visible spectroscopy

Chapter 15 — Gases (37 pp)

15A Gases and the ideal gas equation · 15B Gas stoichiometry and the greenhouse effect

Topic 4 Test A (multiple-choice) and Test B (short and extended response), with fully-worked solutions, are included at the end of this workbook.

Area of Study 3 — How do quantitative scientific investigations develop our understanding of chemical reactions?

Chapter 16 — Practical investigations (35 pp)

16A Investigation design · 16B Scientific evidence · 16C Scientific communication

Practice Examinations

Practice Examinations (132 pp)

Six complete practice examinations, each mirroring the VCAA Chemistry examination structure — Section A (30 multiple-choice questions) and Section B (short- and extended-answer questions, 90 marks), for a total of 120 marks — with a house Chemistry Data Sheet and fully-worked solutions. The six papers span three difficulty levels (two each at easy, medium and hard) and cumulatively cover the complete Units 1 & 2 course, including the key science skills.

≈ 758 pages across the series.