

# Camosun College

## Department of Chemistry and Geoscience

### Chemistry 120 2003/4

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**Texts:**

Brown, Lemay and Bursten  
Chemistry: The Central Science. Ninth edition  
Chemistry 120 laboratory manual  
Study guide for the text.  
Duotang binder for lab reports

These items are available from the bookstore. Students must have their own set of safety glasses in order to work in the laboratory. People who normally wear glasses do not have to purchase another pair.

**Assessment:** The final grade in the course will be based on the following components

Quiz 1	Chapters 1-4 & 10	10%
Quiz 2	Chapters 6-9	25%
Comprehensive final		40%
Laboratory		25%

**Grades:** The following percentages refer to the composite total obtained at the end of the course .

A range	85% to 100%
B range	70% to 84%
C range	60% to 69%
D range	50% to 59%
F range	<50%

**Note:** This table is given only as a guide and the exact equivalency will be determined by the instructor when all the marks are available. In cases where there is a major difference between the mark on the final examination and the composite total, the instructor reserves the right to adjust the final grade to reflect this difference. The passing grade is C and to pass the course, students must obtain passing grades in both the lecture and laboratory portions of it.

### Sequence of Topics

Topics:	Chapters
Review	1,2,3,&4
Gases	10
Atomic structure and the periodic table	6&7
Chemical bonding and molecular geometry	8&9
Intermolecular forces of attraction	11
Solutions	13
Introduction to environmental chemistry	18

**Lectures:** These will follow the sequence given above. The quizzes will be held in the laboratory periods of weeks five and ten.

Out of class work will be assigned each week and the answers to problems will be posted. Before each examination, students will receive a copy of a past examination covering the same topics to help the revision and to guide the classroom review of the material covered. Answers will be given to the numerical parts of the paper but each student is responsible for preparing and checking the descriptive parts of the paper.

## Course content

**Review:** Chapters 1 to 4, the topics below will be covered in class. Students are responsible for the reviewing the remainder of the these chapters which contain material covered in Chemistry 11 and 12 or Camosun's Chem 060 and 080 /110

### Chapter 1

- 1-1 Why do we study chemistry?
- 1-2 Classification of matter
- 1-4 Units of measurement

### Chapter 2

- 2-1 The atomic theory of matter
- 2-2 Atomic structure
- 2-3 Isotopes, atomic numbers and mass numbers
- 2-4 The periodic table
- 2-5 Molecules and molecular compounds
- 2-6 Ions and ionic compounds

### Chapter 3

- 3-2 Patterns of chemical reactivity
- 3-4 The mole
- 3-5 Empirical formulas and combustion analysis
- 3-7 Limiting reagents

### Chapter 4

- 4-4 Chemical reactions
- 4-5 Concentrations of solutions
- 4- 6 Solution stoichiometry

## Gases

### Chapter 10

- 10-1 Characteristics of gases
- 10-2 Pressure
- 10-3 The gas laws
- 10-4 The ideal gas equation
- 10-5 Application of the ideal gas equation
- 10-6 Gas mixtures and partial pressures
- 10-7 Kinetic theory of gases
- 10-8 Effusion and diffusion

## **Atomic structure:**

### Chapter 6

- 6-1 The wave nature of light
- 6-2 Quantized energy and photons
- 6-3 Bohr's model of the atom
- 6-4 The wave behavior of matter
- 6-5 Quantum mechanics and atomic orbitals
- 6-6 Orbital shapes
- 6-7 The many-electron atom
- 6-8 Electronic configurations
- 6-9 The periodic table

## **Periodic properties:**

### Chapter 7

- 7-2 Atomic sizes
- 7-3 Ionization energy
- 7-4 Electron affinities
- 7-5 Metals, non-metals and metalloids
- 7-6 Group trends for groups 1 and 2
- 7-7 Group trends for non metal groups

## **Bonding:**

### Chapter 8

- 8-1 Chemical bonds, symbols and the octet rule
- 8-2 Ionic bonding
- 8-3 Sizes of the ions
- 8-4 Covalent bonding
- 8-5 Bond polarity and electronegativity
- 8-6 Drawing Lewis structures
- 8-7 Resonance structures
- 8-8 Exceptions to the octet rule

### Chapter 9

- 9-1 Molecular shapes
- 9-2 The V.S.E.P.R. model
- 9-3 Polarity of polyatomic molecules
- 9-4 covalent bonding and orbital overlap
- 9-5 Hybrid orbitals
- 9-6 Multiple bonds

## **Intermolecular forces**

### Chapter 11

- 11-1 A molecular comparison between liquids and solids
- 10-9 Real gases and deviations from ideal behavior
- 11-3 Properties of liquids
- 11-4 Phase changes
- 11-5 Vapour pressure
- 11-6 Phase diagrams
- 11-8 Bonding in solids

## **Solutions:**

### Chapter 13

- 13-1 The solution process
- 13-2 Solubility
- 13-3 Changes in solubility
- 13-4 Different ways of expressing concentration
- 13-5 Colligative properties

## **The Environment:**

### Chapter 18

- 18-1 The earth's atmosphere
- 18-2 Sunlight and photochemistry
- 18-3 The ozone layer
- 18-4 Chemistry of the troposphere
- 18-5 The oceans
- 18-6 Fresh water