Review sheet for Final Exam Chemistry 102 Winter 2010 **Monday, Mar. 15th, 4:30 – 7:00 PM, SH C260**

Introduced in Chapter 9 and continued in later chapters

1. VSEPR theory.
2. Bonding, orbital overlap, and hybridization, including multiple bonds.
3. Bond polarity and molecular polarity.
4. Intermolecular forces and their effects on the properties of substances (also in Chapter 14, pp. 511-512).

Introduced in Chapter 10 and continued in later chapters

1. Kinetic molecular theory, including the nanoscale concept of pressure.
2. Ideal gas behavior.
3. Gas quantities and stoichiometry.
4. Gas mixtures and partial pressures.

Introduced in Chapter 11 and continued in later chapters

1. Behavior of liquids, gases, and solids and their phase changes, including nanoscale representations, dynamic equilibrium, intermolecular forces, and enthalpy changes.
2. Properties of liquids.
3. Vapor pressure curves, phase diagrams, and heating curves, including enthalpy changes.
4. Types of solids and their bonding, forces, and properties.

Exam questions can be

1. Quantitative problems (e.g., finding a numerical result, etc.)
2. Qualitative problems (e.g., drawing pictures, estimating an answer, etc.)
3. Open-ended response (e.g., naming a compound, explaining a concept, explaining how to solve a problem, etc.)

Introduced in Chapter 12 and continued in later chapters

1. Kinetic molecular theory as related to chemical kinetics.
2. Reaction rates as a function of changes in concentration.
3. Rate laws and determination of a rate law by initial rates or by integration.
4. Calculations using the rate law, including half-life calculations.
5. Reaction energy diagrams, including activation energy, enthalpy changes, and transition state.
6. Reaction mechanisms, including rate laws of elementary reactions and validity of proposed mechanisms.
7. Effect of temperature changes and catalysts on reaction rates and mechanisms.

Introduced in Chapter 13

1. Characteristics of chemical equilibrium.
2. Equilibrium constant, including its meaning, usefulness, and mathematical form.
3. Calculations using the equilibrium constant.
4. Predictions about reaction rates and direction of reaction using the equilibrium constant.
5. Predictions about changes to equilibrium, including rates and concentrations, due to changes in concentration, volume, pressure, or temperature.

Exam questions based on

1. Lecture material, examples and practice problems,
2. Homework (OWL and textbook), and
3. Recitation quizzes.