Review sheet for Final Exam Chemistry 102 Winter 2010

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.)

Monday, Mar. 15th, 4:30 – 7:00 PM, SH C260

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.