Student Name: _____ Date: _____

Chemistry 40S Final Exam Organizer

The following organizer will assist you with your final exam preparation. The notes, *Study Guide* and worksheets you completed over the past semester will be helpful tools for you to use with your text as you review. I encourage you to refer to the multiple choice quizzes and tests linked to http://vcichemistry.weebly.com/ during your review. See Mr. Bertram to arrange access to your Test Folder for review.

1. Gas Laws

1. Vocabulary
2. The Gas Laws
   - Kinetic Theory Revisited
   - Boyle's Law
   - Charles's Law
   - Gay-Lussac's Law
3. The Combined Gas Law and Avagadro's Principle
4. The Ideal Gas Law
   - Ideal Gases
   - Real vs. Ideal Gases
   - Applying the Ideal Gas Law
5. Gas Stoichiometry
   - Calculations Involving Only Volume
   - Calculations Involving Volume and Mass

1. Electronic Structure, Bonding, and the Periodic Table:

a) Vocabulary

b) Electrons in Atoms
   - The Electromagnetic Spectrum
   - Atomic Models
   - The Quantum Mechanical Model of the Atom
   - Electron Configuration

- Ionization Energy
- Valence

c) The Periodic Table
   - Periodic Trends in: Atomic Size
     Ionization Energy
     Electron Affinity
     Ionic Size
     Electronegativity
   - The Modern Periodic Table

2. Reaction Rate and Chemical Equilibrium:

a) Vocabulary
b) Collision Theory
c) Factors Affecting Reaction Rate
   - Raising Temperature
   - Concentration
   - The Nature of Reactants
   - Particle Size
   - Effect of Catalysts
d) Reversible Reactions
e) Instantaneous Rates and Reaction Mechanisms
f) Rate Laws: Theory and Problems
g) Reversible Reactions and Chemical Equilibrium
h) Factors Affecting Chemical Equilibrium
i) Equilibrium Constant: Theory and Problems
j) Le Chatelier's Principle: Theory and Applications

3. Ionic Equilibria - Acids and Bases:

a) Vocabulary
b) Electrolytes and Nonelectrolytes
c) Acids, Bases, and Salts
d) Ionization of Water
e) pH and pOH: Concept and Calculations
f) Acid and Base Theories:
   - Arrhenius
   - Bronsted-Lowry
g) Strength of Acids and Bases:

- Theory
- Calculating Ka/Kb

h) Neutralization and Salts
i) Acid-Base Titrations
j) Percent of Ionization
k) Finding pH of solutions when given $[H_3O+]$
l) Finding $[H_3O+]$ when given solution pH
m) Neutralization

4. Solubility:

a) Vocabulary
b) Solution Concentration
c) Colligative Properties of Solutions
d) Heterogeneous Mixtures
e) Reversibility, Saturated Solutions, and Chemical Equilibrium
f) Saturated Solutions
g) Factors Affecting Solubility
   - The Nature of Solute and Solvent
   - The Effect of Temperature
   - The Effect of Pressure
h) Solubility Product Constant (Ksp)
i) The Common Ion Effect

5. Oxidation-Reduction Reactions:

a) Vocabulary
b) Oxidation and Reduction
   - Oxidizing and Reducing Agents
   - Oxidation Numbers
   - Rules for Assigning Oxidation Numbers
c) Identifying Redox Reactions
d) Balancing Redox Reactions
e) Half Reactions