

## Chem 101 -Exam 2 Study Guide

**Chapter 5.**Key problems:M&C-Chapter5- 27,28,30,31,33,35,36,44,45,47,52,64,72,78,79,94,96

- 1) Be able to describe the nature of covalent bonds and how they are formed.
- 2) Be able to interpret molecular formulas and draw Lewis structures for molecules using the octet rule.
- 3) Be able to use Lewis structures to predict molecular and electron pair geometry.
- 4) Be able to use electronegativity and molecular geometry to predict bond and molecular polarity.

### Chapter 6.

Key problems:M&C-Chapter 6 38-44,53-59,60,61,65,68,69,77,85,87,91,95,96,101

- 1) Given the identities of reactants and products, be able to write a balanced chemical equation.
- 2) Be able to convert between molar and mass quantities of an element or compound.
- 3) Be able to take the amount of product actually formed in a reaction, calculate the amount that could form theoretically, and express the results as a percent yield.
- 4) Be able to recognize precipitation, acid–base neutralization, and redox reactions.
- 5) Be able to assign oxidation numbers to atoms in compounds and identify the substances oxidized and reduced in a given reaction.

### Chapter 7.

M&C-Chapter 7.22,23,28,29,32,33,56,62,70

- 1) Be able to explain the factors that influence energy changes in chemical reactions.
- 2) Be able to define enthalpy, entropy, and free-energy changes, and explain how the values of these quantities affect chemical reactions. Predict spontaneity of a reaction based on these quantities.
- 3) Be able to explain activation energy and other factors that determine reaction rate.
- 4) Be able to describe what occurs in a reaction at equilibrium.
- 5) Be able to state Le Chatelier's principle and use it to predict the effect on reactions of changes in temperature, pressure, and concentration.

### Chapter 8.

M&C-Chapter 8.24,34,36,40,41,46,50,58,60,62,66,68,69,80,81,82,83,104

- 1) Be able to state the assumptions of the kinetic–molecular theory of gases and use these assumptions to explain the behavior of gases.

- 2) Be able to use Boyle's law, Charles's law, Gay-Lussac's law, and Avogadro's law to explain the effect on gases of a change in pressure, volume, or temperature.
- 3) Be able to use the ideal gas law to find pressure, volume, temperature, or molar amount of a gas sample. Know what STP means
- 4) Be able to use the ideal gas law with chemical equations involving gases to calculate volumes, masses, etc..
- 5) Be able to define partial pressure and use Dalton's law of partial pressures.
- 6) Be able to explain dipole–dipole forces, London dispersion forces, and hydrogen bonding, and recognize which of these forces affect a given molecule.

**A Parting Comment: USE THE STUDY GUIDE BOOK. It's really pretty good!**