

CHM1045 Study Guide for Exam 4: Chapters 8, 9, & 10 (for Tro textbook)

This is NOT a complete list of what will be on the Test. You must also study class notes, the homework, and the textbook. This is just a study guide to help you.

You still have to know everything on Exam 1, 2 & 3. ☹

Chapter 8

- 1) Define, identify and/or give examples of: electron configuration, Aufbau Principle, Hund's Rule, Pauli Exclusion Principle, ground state, excited state, degenerate orbital, shielding, effective nuclear charge, valence electrons, valence shell, s, p, d, & f block, atomic radius, periodic trends of atomic radii, ionization energy, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, etc., ionization energy, paramagnetic, diamagnetic, ionic radii, cations are smaller than parent atom, anions are larger than parent atom, electron affinity, metallic character.
- 2) Write electron configuration for any atom including (5) exceptions (Cr, Mo, Cu, Ag, and Au), calculate effective nuclear charge, identify number of valence electrons of any atom in s or p block, write electron configuration of ions.

Chapter 9

- 1) Define, identify and/or give examples of: types of chemical bonds, ionic bond, covalent bond, metallic bonding, Lewis Dot Structure, Electron Dot Structure, lattice energy, trends in lattice energy (ion size & ion charge), single, double & triple bond, polar covalent bond, nonpolar covalent bond, electronegativity, periodic trends in electronegativity, resonance structures, formal charges, Octet Rule, exceptions to Octet Rule, bond energies, bond dissociation energy, bond enthalpy, bond lengths.
- 2) Draw electron dot structures, draw resonance structures, calculate formal charges, calculate  $\Delta H$  of a reaction using bond enthalpies.

Chapter 10

- 1) Define, identify and/or give examples of: VSEPR, Electron Domain Geometry, linear, trigonal planar, tetrahedral, trigonal bipyramidal, octahedral, molecular geometry, number of electron domains, bent, trigonal pyramidal, see-saw, T-shaped, square pyramidal, square planar, lone pair of electrons, nonbonding pair of electrons, bonding pair of electrons, molecular polarity, valence bond theory, hybridization, sigma and pi bonds, resonance structure, delocalized bond, Molecular Orbital Theory, bonding orbital, antibonding orbital, bond order, diamagnetic, paramagnetic.
- 2) Identify polar or nonpolar molecules, find geometries, find geometries around different central atoms in a larger molecule, identify sigma or pi bonds, draw Molecular Orbital Diagrams, calculate bond order, predict diamagnetic or paramagnetic from M.O. Diagram.